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Educational Media and Technology Yearbook

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Preface

The audience for the *Yearbook* consists of media and technology professionals in schools, higher education, and business contexts. Topics of interest to professionals practicing in these areas are broad, as the Table of Contents demonstrates. The theme unifying each of the following chapters is the use of technology to enable or enhance education. Forms of technology represented in this volume vary from traditional tools such as the book to the latest advancements in digital technology, while areas of education encompass widely ranging situations involving learning and teaching which are idea technologies.

As in prior volumes, the assumptions underlying the chapters presented here are as follows:

1. Technology represents tools that act as extensions of the educator.
2. Media serve as delivery systems for educational communications.
3. Technology is *not* restricted to machines and hardware, but includes techniques and procedures derived from scientific research about ways to promote change in human performance.
4. The fundamental tenet is that educational media and technology should be used to:

   (a) Achieve authentic learning objectives.
   (b) Situate learning tasks.
   (c) Negotiate the complexities of guided learning.
   (d) Facilitate the construction of knowledge.
   (e) Aid in the assessment/documenting of learning.
   (f) Support skill acquisition.
   (g) Manage diversity.

The *Educational Media and Technology Yearbook* has become a standard reference in many libraries and professional collections. Examined in relation to its companion volumes of the past, it provides a valuable historical record of current ideas and developments in the field. Part I, "Trends and Issues in Learning, Design, and Technology," presents an array of chapters that develop some of the current themes listed above, in addition to others. Part II, "Trends and Issues in Library and Information Science," concentrates upon chapters of special relevance to K-12 education, library science education, school learning resources, and various types of library and media centers—school, public, and academic among others. In Part III, "Leadership Profiles," authors provide biographical sketches of the careers of instructional technology leaders. Part IV, "Organizations and Associations in North America," and Part V, "Worldwide List of Graduate Programs in Learning, Design, Technology, Information or Libraries," are, respectively, directories of instructional technology-related organizations and institutions of higher learning offering degrees in related fields. Finally, Part VI, the "Mediagraphy," presents an annotated listing of selected current publications related to the field.

The Editors of the *Yearbook* invite media and technology professionals to submit manuscripts for consideration for publication. Contact Michael Orey (mikeorey@uga.edu) for submission guidelines.

For a number of years we have worked together as editors and the tenth with Dr. Michael Orey as the senior editor. Within each volume of the Educational Media and Technology Yearbook (EMTY) we try to list all the graduate programs, journals, and organizations that are related to both Learning, Design, and Technology (LDT) and Library and Information Science (LIS). We also include a section on trends in LDT, trends in LIS, and we have a section profiling some of the leaders in the field. Beginning with the 2007 volume, we have attempted to generate a list of leading programs in the combined areas of LDT and LIS. One year, we were able to compose an alphabetical list of 30 of the programs that people told us were among the best. However, each year we have worked on being more systematic. Instead of following the *US News and World Report* model and have one top program list, we decided to use some of the same numbers that they use and generate a collection of top 20 lists, rather than attempt to generate a statistical model to generate the rankings list. One thought was to rank programs according to the number of publications that were produced; however, deciding which journals to include was an issue. We have decided to use a 5-year span, in this case 2007 through 2011, as the years to count (since at the time of writing, it is still 2012 and so we do not have a complete year). Furthermore, we decided to only count actual research reports that appeared in one of two journals, *Educational Technology Research and Development* and the *Journal of the Learning Sciences*. These two journals were primarily selected based on the general sense that they are the leading journals in the area of LDT. Noticeably absent is the area of information and library science. So, while these numbers are pretty absolute, choosing to only count these journals is somewhat arbitrary.

The other top 20 lists are based on self-report data collected as part of the program information in the Educational Media and Technology Yearbook. Every year, we collect general information about programs in LDT and LIS and publish this information in the *Yearbook*. Each year we also collect some additional data. We asked the representatives of each of the institutions to enter the US dollar amount of grants and contracts, the number of Ph.D. graduates, the number of Masters graduates, and the number of other graduates from their programs. We also asked them for the number of full-time and part-time faculty. We then generated a top 20 list for some of these categories. The limitation in this case is that it is self-report data and

Table 1 Top 20 Graduate Programs in the area of Learning, Design, and Technology as measured by the number of publications in *Educational Technology Research and Development* and the *Journal of the Learning Sciences*

Rank	Institution	Total points
1	University of Georgia	11.572
2	Indiana University	7.66
3	Arizona State University	7.32
4	Stanford University	5.59
5	Nanyang Technological University	4.83
6	Brigham Young University	4.53
7	University of Wisconsin	4.52
8	Purdue University	4.46
9	Utrecht University	3.94
10	University of Toronto	3.9
11	University of Maryland	3.86
12	SRI International	3.69
13	Open University of the Netherlands	3.66
14	Utah State University	3.33
15	University of Northern Colorado	3.25
16	Aristotle University of Thessaloniki	3
17	University of Missouri	3
18	San Diego State University	2.85
19	University of Colorado at Boulder	2.83
20	Michigan State University	2.73

there is no real way of verifying that the data is accurate. So, while the list of the 30 top programs from the first year lacked hard data, and the lists this year are based on numbers, those numbers may be just as unreliable. In the end, we have a collection of lists that we hope will be of use to our readers. Many of the universities that appeared in the list last year are here again, in addition to many others. More information about many of these universities can be found in Part V of this edition.

There are five top-20 lists in this preface. The first of these top-20 lists is based on a count of publications. We used every issue from the 2007 through 2011 volume years of the *Educational Technology Research and Development* journal and the *Journal of the Learning Sciences*. We eliminated all book reviews and letters-to-the-editor and such. We only used the primary academic articles of these journals. Each publication counted 1 point. If the article had two authors, then each author's institution received 0.5 points. If there were three authors, then 0.33 was spread across the institutions. Also, as an additional example, if there were three authors and two of them were from the same institution, then that institution received 0.66 points and the institution of the remaining author received 0.33. Finally, the unit receiving the points was the University. So, in some cases, you might have publications from two completely different departments in the same journal. Table 1 shows our results. The University of Georgia came out as the top LDT program in the world, in fact the top 3 are the same as last year. The two biggest moves on the list are Utrecht that jumped from 17th last year to 9th this year and Purdue that jumped from 16th to 8th. Michigan State made it in this year and Florida State just barely fell short off the list.

The two primary measures of research achievement are publications and grants. While choosing ETRD and IJLS was somewhat arbitrary, the numbers are verifiable. In Table 2, we present the top-20 programs according to the dollar amount of

Table 2 Top 20 LDT and LIS programs by the amount of grant and contract monies

1	Old Dominion University	Instructional Design & Technology	25,000,000
2	University of Calgary	Office of Graduate Programs, Faculty of Education	20,000,000
3	University of Louisville	Organizational Leadership & Learning	4,500,000
4	University of Massachusetts, Amherst	Learning, Media and Technology Masters Program/Math Science and Learning Technology Doctoral Program	4,300,000
5	Virginia Tech	Instructional Design and Technology	4,100,000
6	George Mason University	Learning Technologies	2,500,000
7	Arizona State University; Educational Technology programs	Division of Educational Leadership and Innovation; Mary Lou Fulton Teachers College	2,000,000
8	New York University	Educational Technology Programs	1,500,000
9	The University of Texas at Austin	Curriculum & Instruction	1,306,456
10	Indiana University	Instructional Systems Technology, School of Education	1,235,000
11	The Ohio State University	Cultural Foundations, Technology, & Qualitative Inquiry	1,200,000
12	University of North Carolina, Wilmington	Master of Science in Instructional Technology—Department of Instructional Technology, Foundations & Secondary Education	1,199,546
13	University of Houston	Curriculum & Instruction	1,000,000
14	Utah State University	Department of Instructional Technology & Learning Sciences, Emma Eccles Jones College of Education and Human Services	850,000
14	Georgia State University	Middle-Secondary Education and Instructional Technology	850,000
16	University of Memphis	Instructional Design and Technology	600,000
16	University of Georgia	Department of Educational Psychology and Instructional Technology, College of Education	600,000
18	Rutgers-The State University of New Jersey	School of Communication and Information	500,000
18	Lehigh University	Teaching, Learning, and Technology	500,000
18	Ohio University	Instructional Technology	500,000

grants and contracts for that program over the academic year of 2010–2011. While Table 1 was constrained to LDT, Table 2 has both LDT programs and LIS programs which resulted in the University of Calgary being number 2 in the grants and contracts list, but not appearing at all in the publication list. In fact, the only institutions that are both on the list for publications and grants are the University of Georgia (1 for publications and 16 for grants), Indiana University (2 for publications and 10 for grants), Arizona State University (3 for publications and 7 for grants), and Utah State University (14 for publications and 14 for grants).

Tables 1 and 2 are measures of research productivity. The remaining three tables are more related to teaching than research. The first, Table 3, shows the top-20 programs in terms of the number of full-time faculty. You will notice that the list is

Table 3 Top 20 LDT and LIS programs by the number of full-time faculty (also shown is the total faculty which includes both full and part time faculty)

Rank	University	Department	Full time	Total
1	Rutgers-The State University of New Jersey	School of Communication and Information	22	37
2	The University of Hong Kong	Faculty of Education	20	110
3	Middle East Technical University	Computer Education & Instructional Technology	20	60
4	Towson University	College of Education	17	22
5	Regis University	School of Education and Counseling	15	165
6	Valley City State University	School of Education and Graduate Studies	15	23
7	University of Bridgeport	Instructional Technology	14	35
8	Utrecht University	Educational Sciences	12	19
9	Fordham University	MA Program in Public Communications in the Department of Communication and Media Studies	12	16
10	Universiti Sains Malaysia	Centre for Instructional Technology and Multimedia	12	12
11	Lesley University	Educational Technology	11	81
12	University of Louisville	Organizational Leadership & Learning	11	25
13	The University of Oklahoma	Instructional Psychology and Technology, Department of Educational Psychology	11	11
14	Taganrog State Pedagogical Institute	Media Education (Social Pedagogic Faculty)	10	30
15	Athabasca University	Centre for Distance Education	10	29
16	Anadolu University	Computer Education and Instructional Technology	10	26
17	Hacettepe University	Computer Education and Instructional Technology	10	24
18	Indiana University	Instructional Systems Technology, School of Education	10	22
19	Utah State University	Department of Instructional Technology & Learning Sciences, Emma Eccles Jones College of Education and Human Services	10	11
20	University of British Columbia	Master of Educational Technology degree program	9	17

ordered by the number of full-time faculty (FT), but number 2, The University of Hong Kong has 110 total faculty members. We decided that full-time faculty was more important than part time as a measure and so only generated one list for number of faculty. We just thought it would be interesting to see the total number of faculty as well. For example, it is interesting to see The University of Hong Kong and the Regis University with very large numbers (110 and 165, respectively) while the Universiti Sains Malaysia and the University of Oklahoma have 12 and 11 full-time faculty and no part time faculty.

Table 4 Top 20 LDT and LIS programs by the number of Ph.D. graduates

Rank	University	Department	Total
1	University of Bridgeport	Instructional Technology	15
1	University of Calgary	Office of Graduate Programs, Faculty of Education	15
3	Lesley University	Educational Technology	11
3	Wayne State University	Instructional Technology	11
3	University of Georgia	Department of Educational Psychology and Instructional Technology, College of Education	11
6	Rutgers-The State University of New Jersey	School of Communication and Information	10
6	Ohio University	Instructional Technology	10
6	University of Houston	Curriculum & Instruction	10
6	Middle East Technical University	Computer Education & Instructional Technology	10
6	George Mason University	Learning Technologies	10
11	Georgia State University	Middle-Secondary Education and Instructional Technology	8
11	Florida State University	Educational Psychology and Learning Systems	8
13	Indiana University	Instructional Systems Technology, School of Education	7
13	Utah State University	Department of Instructional Technology & Learning Sciences, Emma Eccles Jones College of Education and Human Services	7
15	The University of Oklahoma	Instructional Psychology and Technology, Department of Educational Psychology	6
16	Texas Tech University	Instructional Technology	5
16	Arizona State University; Educational Technology programs	Division of Educational Leadership and Innovation; Mary Lou Fulton Teachers College	5
16	Virginia Tech	Instructional Design and Technology	5
16	Towson University	College of Education	5
16	University of Louisville	Organizational Leadership & Learning	5
16	The Ohio State University	Cultural Foundations, Technology, & Qualitative Inquiry	5
16	Iowa State University	School of Education	5
16	Utrecht University	Educational Sciences	5

Please note that the list only goes to 17, but since there was a 7-way tie for 17th, the next university would be 24th place

The next top-20 list is the number of Ph.D. graduates. This list might be a good measure of research productivity as well as teaching productivity. The number of graduates is self-reported. The number of publications is verifiable, so it is interesting to compare who is on both lists. None of the three number ones are on top 20 publications list, but there are five institutions on both lists. University of Georgia, Indiana University, Utah State University, Arizona State University, and Ultrecht University are on both of these lists. University of Calgary is number 2 on both the Ph.D. and the amount of grant monies (Table 4).

Table 5 Top 20 LDT and LIS programs by the number of masters graduates

Rank	University	Department	Total
1	University of Bridgeport	Instructional Technology	294
2	University of Calgary	Office of Graduate Programs, Faculty of Education	250
3	Lesley University	Educational Technology	225
4	Regis University	School of Education and Counseling	200
5	Towson University	College of Education	180
6	Rutgers-The State University of New Jersey	School of Communication and Information	143
7	New York Institute of Technology	Department of Instructional Technology and Educational Leadership	130
8	Utrecht University	Educational Sciences	100
9	Georgia Southern University	College of Education	75
9	University of Central Florida	College of Education—ERTL	75
11	University of British Columbia	Master of Educational Technology degree program	74
12	California State University, East Bay	M.S. Ed., option Online Teaching & Learning	60
12	Michigan State University	College of Education	60
14	Emporia State University	Instructional Design and Technology	52
15	George Mason University	Learning Technologies	50
16	Wayne State University	Instructional Technology	48
17	University of Nebraska Kearney	Teacher Education	46
18	Valley City State University	School of Education and Graduate Studies	45
19	University of Texas at Brownsville	Educational Technology	42
20	University of Missouri—Columbia	School of Information Science & Learning Technologies	40
20	University of Georgia	Department of Educational Psychology and Instructional Technology, College of Education	40
20	University of Central Arkansas	Leadership Studies	40

Our last top-20 list is based on the number of masters graduates. In our mind, we might consider this an indication of whether the program is more practitioner-oriented than say the number of Ph.D. graduates. Interestingly, University of Calgary is second here, and is second in both grants and Ph.Ds. So, this differentiation may be meaningless. It is interesting to note that last year we had seven schools that produced more than 100 graduates last year and this year we have eight. The University of Bridgeport graduated 294 masters students! While the economy has not done so well, several schools have attracted fairly large numbers of masters students to their programs and successfully graduating some pretty large numbers of graduates. Some people seek degrees during these economic down turns (Table 5).

We acknowledge that any kind of rankings of programs is problematic. We hope you find our lists useful. If you have suggestions, please let us know and we will try to accommodate those changes in future publications of the *Yearbook*. If your program is not represented, please contact one of us and we can add you to the database so that you can be included in future issues.

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Part I
Trends and Issues in Learning, Design, and Technology

Chapter 1
Introduction

Daisyane Barreto and Michael Orey

Learning, Design, and Technology

The use of computer technologies and Internet has increased in the past decades. The number of individuals buying computer machines for professional and personal use is growing. For instance, according to a past report from the US Census Bureau, the number of households who acquired computer machines increased approximately from 8 to 62 % within the years of 1984–2003. Moreover, the number of households who had Internet access increased approximately from 18 to 55 % within the years of 1997–2003 (Day, Janus, & Davis, 2005). Even though this information indicates the adoption of computer and web-based technologies is increasing among households in the USA, there are still individuals who do not have means to acquire or to access these technologies on a daily basis. In this case, the role of educational environments is crucial to provide access to computer and Internet as well as to overcome the digital divide in the country (DeBell & Chapman, 2006). Indeed, school environments can be sites where students can develop academically and technologically if equal access to both kinds of information is guaranteed.

Besides the potential digital divide, the increase in advance of technology and the instant access to information via computer or mobile technologies have challenged the education to reconsider its current school system. As some learners interact with these technologies out of the school context, educators and policy makers may need to question how to embrace and leverage skills and knowledge that learners are developing in informal contexts. For example, educators could create opportunities in which learners' technical skills could be encouraged and strengthened. Learners could be advised to reconsider new ways to present and represent their school work (e.g., video presentation, web pages, podcast, animation), which could enhance their creativity and promote innovative production. In addition, teachers

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and instructors could use these technologies to support collaboration among students. For instance, students could work in projects, papers, and presentations remotely and at their own time. Therefore, it is important to investigate best practices to integrate new technologies (e.g., cloud-based applications, smartphones, and tablets) into the school curriculum program as well as to adopt innovative pedagogical approaches that enable and nourish learners' skills and experiences from informal to formal contexts.

Furthermore, the adoption of new technologies should be planned carefully. Generally, the high priority given to technology in education can lead to the acquisition of new tools without a clear road map for their integration into the school. That is, just acquiring new technologies for the school will not improve students' learning experiences; however, developing a curriculum program that incorporates appropriate technologies strategically will. Thus, it is essential that educators and stakeholders envision how teachers and students can use these technologies to enhance, create, and share learning content. Delineating a plan for training teachers and faculty as well as a plan for the technology use (i.e., when, how, and what kind of technologies) is needed to support an effective technology-based learning environment.

Given the aforementioned reasons, combining knowledge domains associated with learning theories, instructional design principles, and technology practices might be a key feature to design and develop innovative and well-suited initiatives that implement cut-edge technologies for educational purpose. For instance, fundamental premises of learning theories can be applied to create and use educational resources and instructional programs based on the ways people learn. Meanwhile, instructional design principles can be applied to create a plan for the adoption of technology grounded on theories and principles of learning. And by implementing technology in educational contexts, educators can develop technology practices such as identifying appropriate tools for specific learning contexts or designing learning materials grounded on theories and principles of learning.

Thus, this section of the book will introduce a series of chapters written by scholars in the field of instructional technology. These chapters will refer to previously mentioned and other relevant issues in the field. These chapters have been organized into three themes: (a) *overview of the trends and issues in field*, in which Abbie Brown and Tim Green present the current challenges and tendencies in instructional technology; (b) *benefits and challenges of current pedagogical approaches in educational settings*, in which Beaumie Kim, Lynde Tan and Seng Chee Tan propose a pedagogical approach that harnesses students' previous experiences playing games and with learning, within formal and informal contexts, to develop games for learning; while Angela van Barneveld and Peggy Ertmer examine the challenges and motivations to implement problem-based pedagogies in engineering schools; (c) *current studies examining the principles of multimedia learning*, in which Tonia Dousay explored how multimedia principles could be implemented in design of instructional materials to leverage (to have an influence on) learner interest; while Michael Cottam and Wilhelmina Savenye investigated how the use of multimedia features such as text and pictures could reduce learners' cognitive load and improve learners' listening comprehension in a foreign language learning course.

Overview of the Trends and Issues in the Field

With new trends in instructional technology, it is important to examine the conditions of the field regarding the challenges and opportunities for education brought by contemporary technologies. In fact, Abbie Brown and Tim Green have addressed these issues effectively in the first chapter of this section. According to the authors, the funding availability is still scarce for K-12 and higher education settings. Even with this deficit in funding, education sectors were still able to succeed integrating instructional technology with novel approaches. The authors provided an overview of the current status of instructional technology in three education sectors: corporate training, higher education, and K-12 education.

In terms of corporate training, the authors: (a) reported the cutbacks (or decline) on investments for learning; (b) presented the top content topics in corporate instruction; (c) indicated the most popular methods to deliver instructional content; (d) pointed out current trends that should be taken into consideration such as *big data* and the cloud computing technologies.

Regarding the higher education sector, Abbie Brown and Tim Green reported a list of prevalent technologies being used to support instruction in universities and colleges, such as course management systems and document management tools. In addition, the authors identified current trends for higher education. Massive Online Open Courses (MOOCs) is mentioned as the newest movement in the field that attends both the demand for online learning and open education resources. Other innovative approaches to consider in the future are strategies such as "gamification," which uses game elements to create engaging learning experiences.

As for K-12 education, Abbie Brown and Tim Green reported the ways in which some states and districts have used technology to "minimize costs" in schools such as adopting open textbooks and using digital content/resources in their curriculum. Moreover, the authors indicated Personalized Learning Environments (PLEs) as an "emergent theme" in K-12 settings. Indeed, PLEs might enable learning opportunities for students, but it might present challenges to teachers and administrators, who might need to reconsider their views of teaching and learning when adopting this approach. Other trending technologies being used by students, such as social media, might also bring similar opportunities and challenges for K-12 education.

Benefits and Challenges of Current Pedagogical Approaches in Educational Settings

The integration of technology in education entails not only the adoption of tools, but also the embracement of novel pedagogical approaches to enhance teaching and learning. Implementing new pedagogical approaches in the classroom might involve a change in how teaching and learning is perceived. That is, the role of the instructor/teacher might need to shift from being the formal authority to the facilitator of the learning experience, in which learners are empowered with the information needed to take ownership of their own learning. This section introduces the potential benefits and challenges of implementing new pedagogical approaches in education with Beaumie Kim, Lynde Tan and Seng Chee Tan's chapter ""Perhaps This Can Be For Education": Learners' Cultural Models for Educational Game Design" and Angela van Barneveld and Peggy Ertmer's chapter "Implementing problem-oriented pedagogies in engineering education: examination of tensions and drivers."

First, Beaumie Kim and colleagues argued in their chapter that equipping schools with new tools and devices is not an optimal solution to generate positive learning outcomes for students. Instead, the authors proposed a pedagogical approach that embraces students' previous knowledge and experiences to design games for learning. Grounding on Brian Street and other scholars' work, Beaumie Kim and colleagues framed their pedagogical approach as a process that builds on students' literacy practices. These literacy practices involve individuals constructing meanings through social practices and experiences. In addition, these practices are not bounded to formal contexts, and in fact, these practices can be understood as "assets" that individuals gain from informal experiences and contribute to development of literacy practices in formal contexts. In their chapter, Beaumie Kim and colleagues focused on learners' literacy practices developed in and out of school context and how these practices could be used to understand learners' *cultural models*, which can be understood as "stories and images" that characterize learners' understanding of what "typical" cases or situations are. The authors examined learners' cultural models of games and learning in five game design workshops offered to students between ages 13 and 15. From this study, Beaumie Kim and colleagues were able to identify three major themes related with students' cultural models: (a) *learning*, in which students' views of learning (e.g., teacher-centered, knowledge measurement) were challenged and transformed throughout the workshops; (b) *technology*, in which students revisited the concepts of using technology (i.e., entertainment purpose) to address their educational goals; and (c) *aesthetic*, in which students expressed through images and game design, their emotions. Overall, Beaumie Kim and colleagues argued for playful experiences, such as the one proposed in their study as means to foster and expand students' knowledge and concepts.

Similarly, Angela van Barneveld and Peggy Ertmer advocated for novel pedagogical approaches in their chapter. The authors argued for an integration of theory and practice within the engineering curriculum program. That is, the curriculum should not be limited to the development of technical skills, and instead, it should encourage the development of a set of skills needed to be a successful engineer in the job market. Therefore, the authors argued for problem-based pedagogies in engineering schools in order to bridge the gap between skills taught and skills needed. Problem-based pedagogies involve the design of learner-centered environments in which learners are presented with ill-structured problems as means to develop knowledge and skills needed to function on the job. Nevertheless, like any new approach in education, potential challenges can be faced by educators when introducing problem-based pedagogies in the classroom. These challenges may vary within the different levels in the educational system (e.g., administrators, colleagues, students). In their chapter, Angela van Barneveld and Peggy Ertmer examined the challenges of implementing problem-based pedagogies, and at the same time, present the reasons to adopt such approaches in engineering school as means to improve teaching and learning practices. First, the authors highlighted how problem-based pedagogies meet criteria "needed for engineering education." Moreover, the authors listed benefits of such approaches for engineering programs, including authentic situations, acquiring knowledge and skills directly related with the problem presented, overcoming the gap between theory and practice, and transferring skills. Still, the authors also addressed some of the tensions implementing problem-based pedagogies, such as structural and cultural barriers in the educational system. Besides the identified tensions, the authors have identified drivers for implementing problem-based pedagogies in engineering schools, including connecting foundational and practical knowledge, increasing learners' motivation, supporting learning and transfer, and integrating and applying process skills. Overall, the tensions should not been seen as constraints that will stop the implementation of problem-based pedagogies. In fact, educators and stakeholders should seek to overcome these tensions in order to promote and foster learning environments that can lead to innovative production. Moreover, faculty's experiences with problem-based pedagogies can be used as means to overcome tensions and leverage strategies to adopt and fit problem-based pedagogies in engineering schools.

Current Studies Examining the Principles of Multimedia Learning

To generate educational resources that can facilitate learning, sound instructional design principles should be applied. In fact, the purpose of instructional design is to improve the quality of instruction (Reigeluth, Bunderson, & Merill, 1994), which can be accomplished if instructional designers consider these principles to guide their work. Instructional designers could organize complex information through graphs or images in a way that could be easier for learners to comprehend. And an approach that follows these guidelines is *multimedia learning*. Multimedia learning can be simplified as the learning resulted from the combination of pictures and words (Mayer, 2009). In this case, instructional designers apply research-derived principles to design textual and visual information effectively, consequently enhancing learning. This section introduces two studies examining Richard Mayer's principles of multimedia learning: Tonia Dousay's chapter on "Multimedia design and situational interest: A look at juxtaposition and measurement" and Michael Cottam and Wilhelmina Savenye's chapter on "The Effects of Visual and Textual Annotations on Spanish Listening Comprehension, Incidental Vocabulary Acquisition and Cognitive Load."

First, Tonia Dousay highlighted in her chapter that online learning is probably an area that might benefit of well-designed learning materials based on principles and theories. Grounding on cognitive and motivation theories, Tonia Dousay argued online materials could be designed to not only enhance learning, but also to motivate and sustain learners' interest in the topic or content presented. In addition, the author introduced key principles of multimedia design and how instructional designers could apply these principles to design more comprehensive information. A series of studies were also presented in the chapter indicating the benefits of using images to represent complex information, especially in the medical field. These benefits included improvements in patients recalling and communicating health information with practitioners. Besides improvements in comprehension, Tonia Dousay pointed out the importance of studying motivation and multimedia principles together, especially when there is a lack of multimedia design studies focusing on learner interest. Tonia Dousay described in her chapter the different types of interest, how learner interest could be applied and measured in educational contexts. Overall, using visual representations for instructional purpose can go beyond facilitating learning, as the aesthetic appeal of images and graphics can potentially stimulate learner interest on the topic being studied.

With the increase in numbers of online learning in higher education and the demand for online foreign language course, Michael Cottam and Wilhelmina Savenye examined college students' listening comprehension of Spanish language. According to the authors, completely asynchronous foreign language courses usually rely on auditory inputs and using only these types of inputs may limit students' comprehension due to the lack of nonverbal cues. Thus, drawing on cognitive load theory and multimedia learning principles, Michael Cottam and Wilhelmina Savenye argued that using multimedia features along with words could enhance students' comprehensibility of foreign language and reduce students' cognitive load. Several studies were presented in the chapter indicating the positive outcomes in second language comprehension when textual and visual information is applied instead of text only. In their study, the authors examined 35 college students enrolled in elementary-level Spanish courses to investigate the effects of visual and textual features on students' vocabulary acquisition and listening comprehension. Overall, Michael Cottam and Wilhelmina Savenye's study presented a positive experience when developing online materials for second language acquisition. For instance, the use of images and text definitions helped students with their listening comprehension and even increased their vocabulary since most key words were new to students. The study also supported previous studies in the multimedia learning principles and cognitive load theory.

Implications of These Studies to the Field

Given the chapters presented in this section of the book, the current trends for educational technology in 2013 include: (a) analyzing the trends and issues in the use of technology to improve teaching and learning, (b) investigating and implementing new pedagogical approaches that can benefit educational contexts, and (c) using multimedia learning principles to stimulate learner interest and foreign language comprehension. In summary, knowing that one of the main purposes of instructional design is to improve instruction, and consequently learning, it might be important that educators and administrators attend to students' prior experiences from informal contexts. Learning activities could be designed in order to harness and leverage learners' informal experiences, which could potentially motivate and increase learner interest in academic content. Moreover, learning in schools should not be limited to academic content. School programs should include the development of life-long skills and competencies, which learners might need to succeed in the work place. Finally, with the increase in growth of online learning, instructional designers and researchers should not only investigate and implement multimedia learning principles to facilitate learning, but should also consider how these principles could be used to motivate and sustain learner interest over academic content, especially if learners may have a negative attitude toward that content.

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Chapter 2
Issues and Trends in Instructional Technology: Maximizing Budgets and Minimizing Costs in Order to Provide Personalized Learning Opportunities

Abbie Brown and Tim Green

Introduction

We continue the tradition of reporting the past year's issues and trends that shape attitudes and approaches to instructional technology. This chapter comprises four sections: Overall Developments; Corporate Training and Development; Higher Education; and K-12 Settings.

Overall Developments

As with the previous year, the nation's economy continued on a slow growth pattern. Funding for K-12 and higher education took a sizeable hit throughout the nation. Federal funding for technology—although less than robust—was available for K-12 and higher education through Federal stimulus programs. Private sector funding for technology increased slightly in comparison to the previous year. Although funding remained an issue, all sectors continued to provide robust and innovative approaches to integrating instructional technology. The K-12 and higher education sectors continued to maximize cost savings by sharing resources through the use of cloud computing, collaborative online environments, e-books, and other digital online content and resources.

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Corporate Training and Development

As we have done in previous issues and trends, chapters of the yearbook (e.g., Brown & Green, 2011, 2013), we continue to track corporate application of instructional technologies primarily by referring to the American Society for Training and Development's (ASTD's), *State of the Industry* report, (Miller, 2012). The current ASTD annual report is based on data collected from consolidated sources (organizations regularly submitting annual data), BEST award winners (organizations recognized by ASTD for their exceptional efforts in support of learning within the enterprise); and Fortune Global 500 companies (the top 500 revenue-producing corporations worldwide). This represents data collected from over 500 different business organizations. Secondary sources used to track corporate trends include the, *Gartner Hype Cycle Special Report for 2012* (Fenn & Raskino, 2012) and reports sponsored by the Pew Research Center.

Learning Expenditures

ASTD reports organizational expenditures for learning decreased slightly (around 4 %, adjusting for inflation) since its last report (Miller, 2012). Small organizations report spending more per employee than larger ones: companies with fewer than 500 employees spent an average of $1,605, while companies with 10,000 or more employees spent an average of $825. Direct spending on learning and development compared to payroll increased as it has in previous, recent reports, up 16 % from the previous year.

The ASTD reports that employees are continuing to make use of the learning and development opportunities offered by their employers; according to the most recent report, individuals spent an average of 31 h in training during 2011 (Miller, 2012). The ratio of learning staff to employees decreased in the most recent ASTD report, which is consistent with the trend reported in previous years (with the exception of the penultimate, 2010 report in which the ratio indicated an increase in learning staff (Patel, 2010)). Miller's interpretation that this is probably due to the increase in outsourcing and investments made in external services (Miller, 2012) is no doubt correct.

Instructional Content

ASTD's latest industry report indicates that, as in recent years past, the top three content topics for corporate instruction are: managerial and supervisory, profession and/or industry specific, and business processes, procedures, and practices (Miller, 2012). These three topic areas account for 36 % of the instructional content available within the responding organizations (Miller). The content areas that account for the least amount of instructional content (17 %) are executive development, customer service, and basic skills (Miller).

Methods of Instructional Delivery

The majority of organizations included in the ASTD state-of-the-industry report make use of a combination of instructional delivery methods, most commonly: face-to-face, instructor led; self-paced; and e-learning. E-learning is defined in the report as "*…the use of electronic technologies to deliver information and facilitate the development of skills and knowledge*" (Miller, 2012, p. 10). E-learning technologies are increasing in popularity as a delivery method. Technology-based instructional delivery methods account for 37.3 % of the formal learning hours offered by the business organizations reporting. Delivery of instruction using mobile devices is becoming increasingly popular, up significantly from the previous year's report; the 2011 report shows 1.4 % use; the 2010 report shows a 0.4 % use.

The increased popularity of mobile devices for instructional delivery is unsurprising when one takes into consideration the increased use of mobile devices among younger, educated individuals (e.g., the increased use of tablets and smartphones to read about news, as reported by Pew Research Center's Project for Excellence in Journalism, 2012). The ASTD report confirms this increased use while pointing out by virtue of the small percentage of use how far the industry is from ubiquitous use of mobile technologies for instruction. Mobile devices and electronic technologies in general continue to be of significant interest to business-oriented instructional designers; it is notable that in the 2012 volume of the journal, *Performance Improvement*, at least seven of the articles published focus on the use of computer-based, primarily mobile, technologies for instruction.

Also of note are recent business technology trends identified in the, *Gartner Hype Cycle Special Report for 2012* (Fenn & Raskino, 2012). New technologies of particular interest to instructional designers include:

- Big Data—loosely defined as massive amounts of data (30 terabytes or more) analyzed for the purpose of seeing trends and opportunities (see Weatherington, 2012; IBM Information on Demand & Business Analytics Forum. (Producer), 2012).
- The Internet of Things—generally defined as information networks based on everyday objects embedded with sensors and/or transmitters such as RFID tags (see Chui, Loffler, & Roberts, 2010).
- Cloud Service Brokerage—organizations and individuals are making greater use of cloud computing technologies, which allow individual users and groups to access and refine documents and data from multiple devices and locations.

Both Big Data and The Internet of things are concepts that address the interpretation and management of huge amounts of data to improve predictions and processes. Cloud service issues are directly related to mobile computing and the increased use of mobile devices such as tablets and smartphones. Overall, the trends of the recent year reflect relatively steady spending on employee instruction; continued focus on instruction to support management and supervision, professional and industry-specific information, and business processes, procedures and practices; use of multiple methods of delivery, ranging from face-to-face sessions to E-learning, with a continued increase in the popularity of E-learning methods; and increased attention on the potential for instruction delivered to mobile devices.

Higher Education

We review higher education's instructional technology application by referring primarily to the, *ECAR Study of Undergraduate Students and Information Technology* (Dahlstrom, 2012); *The EDUCAUSE 2011 Core Data Service Report* (Grajek & Arroway, 2012); *The NMC Horizon Report*: *2012 Higher Education Edition* (Johnson, Adams, & Cummins, 2012a), and the Babson Survey Research Group's, *Going the Distance*: *Online Education in the United States*, *2011* (Allen & Seaman, 2011) and, *Digital Faculty*: *Professors*, *Teaching and Technology*, *2012* (Allen & Seaman, 2012). The ECAR, EDUCAUSE, and Babson Survey Research Group reports are based on large-scale, national, and international surveys. *The Horizon Report*, sponsored by the New Media Consortium, is a report generated by an international body of experts convened as an advisory board.

Campus Technology Support and Use of Technology for Instruction

Data gathered for the EDUCAUSE Core Data Survey (Bichsel, 2012; Grajek & Arroway, 2012) indicates that 91 % of the institutions surveyed provide wireless access in some or all student housing rooms; 85 % provide cable television in some or all student housing rooms (Grajek & Arroway). Ninety-nine percent of the institutions surveyed support a course management system (CMS); 65 % of the faculty use CMSs, but 48 % make use of only basic features (Grajek & Arroway).

Of the institutions surveyed by EDUCAUSE, the most popular and common technologies in place for instructional use include, clickers, document management tools, and wireless Internet connectivity (Bichsel, 2012). Bichsel also notes that three of the more substantial changes reported since the previous year are: increases in the number of distance learning classrooms (up 14 %); provision for document management tools (up 16 %); and use of hybrid courses (up 15 %) (Bichsel, 2012).

A significant technology trend is the continued increase in the number of portable devices (laptops, tablets, smartphones, etc.) students bring with them to campus and to class (Bichsel, 2012; Dahlstrom, 2012). Bichsel refers to these as "user-provisioned technologies," (2012, p. 2), and notes their increased use is causing a shift to an, "… 'anytime/anywhere' and interactive learning environment," (2012, p. 2).

Learning Online. Online learning continues to gain in popularity. According to the, *Online Education in the United States*, report (Allen & Seaman, 2011), over 6.1 million students took at least one online course during the fall 2010 term, an increase of over half a million since the previous year's report. While the ten percent growth rate for online students is relatively low compared to recent years, it far exceeds the less than one percent growth of the higher education student population for the year reported; 31 % of all higher education students now take at least one course online (Allen & Seaman, 2011). The, *ECAR Study of Undergraduate Students and*

Information Technology, also reports 31 % of the students surveyed took at least one online course in 2012; this is more than double the number of students taking online courses since 2008 (Dahlstrom, 2012).

Most fully online programs of study report growth, though a significant number report steady enrollment (Allen & Seaman, 2011). Academic leader and faculty perceptions of online learning changed little in the past year, though in Allen and Seaman's most recent report, the percentage of academic leaders who rate online learning outcomes as similar or superior to face-to-face instruction has increased from 57 % to 67 % (2011). The vast majority of institutions that offer online instruction provide some form of training for teaching faculty; most common are internally running training sessions and informal mentoring (Allen & Seaman).

MOOCS. Though not mentioned in any of the most recent survey reports, massive online open courses (MOOCs) have become a "hot topic" among educators this past year. Articles in recent issues of *MIT Technology Review* (Carr, 2012) and *Communications of the ACM* (Vardi, 2012) have addressed the potential impact of MOOCs on higher education. MOOCs are presented free-of-charge by institutions including Stanford and MIT, and multiple thousands of students from around the world register for them. MOOC participants do not accrue credits toward a degree, though some courses offer a certificate of completion (Papano, 2012). MOOCs may be viewed as a natural next step, developing from the Open Courseware movement (Butin (2012). Instructional technology professionals and institutions of higher learning are currently struggling with how to best approach MOOCs since they represent a significant disruption to such established practices as course delivery, faculty-assigned time, and student-fee revenues (Carr, 2012). The extensive number of MOOC-related messages posted on the ITFORUM listserv during the months of November and December in 2012 (e.g., Schankman, 2012) are excellent examples of a variety of differing views on the subject, and an indication of how the instructional technology community has focused its attention on MOOCs this past year.

Faculty Use of Technology for Instruction

According to the report, *Digital Faculty*: *Professors*, *Teaching and Technology*, *2012* (Allen & Seaman, 2012), university faculty are making increased use of digital media and online resources for instructional purposes.

Both the EDUCAUSE Core Data Service Report (Grajek & Arroway, 2012) and the Digital Faculty report (Allen & Seaman, 2012) indicate that faculty are commonly making use of a CMS to share syllabi, communicate with students and record grades, but only a small portion of faculty make use of the any other CMS functions (e.g., discussion forums).

According to the faculty and academic administrators responding to the surveys that form the results reported by Allen and Seaman (2012), more than one-third of faculty regularly assign books that are available in electronic formats and 43 % of instructors indicate they at least occasionally create digital teaching materials, open educational resources, or captured lectures. However, there is some concern among faculty that the time and effort put into producing these materials may not be respected or rewarded by their institution (Allen & Seaman).

More than 80 % of faculty responding to the Digital Faculty survey state they at least occasionally make use of video or simulations for instruction. Online instructors make even greater use of video and simulations (Allen & Seaman, 2012).

Student Computing

The, *ECAR Study of Undergraduate Students and Information Technology* (Dahlstrom, 2012) indicates that the majority of students prefer blended learning (face-to-face courses that include online activities and resources). Seventy percent of students responding to the ECAR survey stated they learn most in blended learning environments. Students 25 or older prefer classes with online components than do younger students (Dahlstrom).

The latest ECAR study results indicate that students expect faculty to use technology as part of their instructional practice; 68 % of student respondents report their instructors are proficient with technology and use it for instructional purposes, a significant increase over recent years (Dahlstrom, 2012). According to the ECAR study, the "wish list for instructors' technology use" has at the top of the list: use of open educational resources and simulations or educational games. It is interesting to note that game-based learning is mentioned in The Horizon Report (Johnson et al., 2012a) as a near-term horizon technology to watch, and that *Gartner's Hype Cycle Special Report for 2012* mentions "gamification" in its "innovation insights" section as a technology that can increase engagement and motivation (Fenn & Raskino, 2012).

While tablets, smartphones, and e-readers are becoming increasingly popular among students, by far the three most important devices for productivity are currently laptop computers, printers, and USB flash or thumb drives (Dahlstrom, 2012).

The preferred method of communication with faculty is face-to-face, via CMS, or by e-mail (Dahlstrom, 2012). The preferred use of social media continues to be for connecting with friends (Dahlstrom); this corresponds with a minority of faculty reporting use of social media to communicate with students (Allen & Seaman, 2012). Texting, instant messaging and online chatting are typically used by students to interact with each other (Dahlstrom, 2012).

K-12 Education

As with previous issues and trends chapters (e.g., Brown & Green, 2011, 2013), we have primarily consulted three national annual reports as the basis for reporting the application of technology in the K-12 sector. These reports are *Technology*

Counts 2012, *The 2012 Horizon Report*: *K-12 Edition*, and the Project Tomorrow Speak Up reports (*Mapping a Personalized Learning Journey*: *K-12 Students and Parents Connect the Dots with Digital Learning*, and *Personalizing the Classroom Experience—Teachers*, *Librarians and Administrators Connect the Dots with Digital Learning*). *Technology Counts 2012* is the 13th annual report published by *Education Week*. This report focuses on the overall state of educational technology in K-12 schools. *The Horizon Report*, produced by the New Media Consortium and the Consortium for School Networking (CoSN), focuses on emerging technologies or practices that are likely to gain use within K-12 over the next year to 5 years. *Mapping a Personalized Learning Journey* and *Personalizing the Classroom Experience* reports are the most recent in a series of reports published by Project Tomorrow that focus on students, parents, teachers, and administrator perceptions about and use of instructional technology, and the availability these groups have to technology. The reports are a synthesis of data collected from 330,117 K-12 students, 38,502 teachers and librarians, 44,006 parents, and 4,133 school/district administrators (Project Tomorrow, 2012a, 2012b).

The major issues involving the use of K-12 educational technology have remained relatively consistent over the last reviews (Brown & Green, 2011, 2013). Three issues that have remained in the forefront are the sustained growth in online learning, the expanded use of mobile devices, and the continued use of social media tools. In analyzing the research reports we explored to write this current review, two key themes emerged—the need to minimize costs while continuing to deliver robust IT services and the use of instructional technology to support personalized learning.

Funding Technology

As has been the case over our last several reviews, funding for overall K-12 remains tenuous. Thirty-seven states have decreased per-student spending from fiscal year 2008 through fiscal year 2013. Seventeen states have cut per-student spending by more than 10 % from 2008 levels—while Arizona, Alabama, and Oklahoma have reduced per-student spending by more than 20 %. Although state revenues have improved on average over the past year and funding cuts have slowed (and in some states funding has actually increased), school funding is considerably below 2008 pre-recession levels (Oliff, Mai, & Leachman, 2012, pp. 1–2). It will take several years for school funding to catch up based on current economic growth.

Specific expenditures on educational technology purchases on a district, school, or per-student basis are not readily available. What can be reported is the total amount that was spent by K-12 on information technology (IT), where much of the funding came from, and what categories of expenditures were made. According to a report by the Center for Digital Education (Cauthen & Halpin, 2012a, 2012b), it is estimated that K-12 spent 9.5 billion dollars on IT during 2012 (p. 6). This report also listed the major sources of the funding. “Ninety-three percent of school districts rely on federal grant programs like Investing in Innovation, Race to the Top, Title I, E-Rate and others. Districts also rely heavily on state and local grants (77 %), PTA and school association fundraising (77 %), private grants (75 %) and technology bonds (30 %) to fund education technology" (p. 2). This same report indicated the breakdown of IT spending in 2011–2012 by districts as being: 37 % on IT services; 18 % was spent on hardware; 17 % on network and telecom; 15 % on software related to curriculum; and 13 % for desktop or enterprise software (Cauthen & Halpin).

Minimizing Costs

Despite the funding issues K-12 faced, districts continued to implement technology at a rapid rate. In some instances, this was spurred by several new or continuing statewide instructional initiatives. One example is the requirement for students to complete an online course before graduating from high school. Idaho and Virginia signed legislation in 2012 to require students to take an online course before graduating. This is a continuing requirement for Alabama, Florida, and Michigan students. Many additional states are looking into adding this requirement as well. Another example of a statewide initiative is the recently passed legislation in Florida requiring districts to expend at least 50 % of their instructional materials allocation on digital or electronic state-adopted materials by the 2015–2016 fiscal year (Florida Department of Education, 2012). Finally, one of the most challenging recent initiatives involves the implementation of the Common Core State Standards. Over the next few years, districts are expected to be able to test their students using online assessments rather than traditional paper and pencil tests. This has forced some districts to move funding away from other IT expenditures into technology improvements that will allow for the required online assessments (O'Hanlan, 2012).

As districts focus on the challenges brought about by these (and other) initiatives, the impact on IT budgets will be sharply felt. Districts are being creative as they cut or minimize costs in certain areas in order to meet the technology requirements of these initiatives. California and Utah, for example, launched open textbook initiatives where textbooks are made available online for free (California began initiative in 2009; Utah began in 2011). Similarly, the Indiana Board of Education developed waivers for districts to use digital content rather than paper-based textbooks. Eleven other states have legislation that allows for digital curriculum to be purchased (in many cases this includes the necessary hardware as well). The use of open textbooks and digital resources has allowed money used for textbooks to be shifted to IT (O'Hanlan, 2012).

The challenge for K-12 will continue to be maintaining and improving access to instructional technology and IT services while having to cut or minimize costs due to less than robust funding for K-12 education. Statewide K-12 initiatives—technology and non-technology based—will continue to bring about challenges that districts will have to meet through the use of instructional technology.

Personalizing Learning

A prominent theme that emerged as we reviewed reports and other sources was the desire (primarily from students) and the need (of teachers and administrators) to leverage existing and emerging technologies to support personalized learning (Johnson, Adams, & Cummins, 2012b; Project Tomorrow, 2012a, 2012b). The idea of personalizing learning is described in *Mapping a Personalized Learning Journey*: *K-12 Students and Parents Connect the Dots with Digital Learning* (Project Tomorrow, 2012a). The report states that, "The infiltration of a sweeping range of different technologies into our everyday lives has created an expectation that all interactions should be highly personalized to meet our individualistic needs" (p. 1). The *2012 Horizon Report for K-12* includes personalized learning environments as being a trend to watch over the next 2–3 years (Johnson et al., 2012b, p. 24). The trend toward providing more personalized learning through the use of instructional technology, we believe, will be felt throughout K-12 for years to come, and it will require districts to embrace new approaches to teaching and learning. This point was discussed in the Project Tomorrow report—*Personalizing the Classroom Experience—Teachers*, *Librarians and Administrators Connect the Dots with Digital Learning*. The report stated that, "The paradigm shift is being driven by a number of factors including the new skills students will need to compete in the global marketplace, the concerns of parents (and employers) about education systems, and the explosion of technology tools that have transformed many aspects of our daily life but have yet to fully infiltrate the traditional school model" (Project Tomorrow, 2012a, 2012b, p. 2).

It is important to underscore the concept that each district has its own unique challenges. Therefore, it will require districts to carefully and individually consider the way instructional technology is being leveraged if the paradigm shift to personalized learning is going to take place. We discuss a few key instructional technologies that are driving this move toward personalized learning.

Social Media and Collaborative Tools. Although students have limited access to social media in school, students are increasingly using these tools for personal use. Students in grades 6–12 are using social media for a number of activities (see Table 2.1). Twenty percent of students in grades 3–5 indicated that they are regularly updating a social networking site of their own; typically on age appropriate and monitored site such as Club Penguin or Webkinz (Project Tomorrow, 2012a, p. 3). Students are also using social media and other collaborative tools outside of the classroom for academic needs and interests. According to the data presented in *Mapping a Personalized Learning Journey*: *K-12 Students and Parents Connect the Dots with Digital Learning*, K-12 students are engaged in the following activities:

- 50 % (approximately) of the high school students surveyed have searched for online information to help them better understand content being studied
- 46 % of high school students and 30 % of middle school students reported using Facebook as collaboration tool for classroom projects

Table 2.1 Personal use of social media by students in grades 6–12 (adapted from Project Tomorrow, 2012a)

Social media activity	Percentage of students in grades 6–8	Percentage of students in grades 9–12
Maintain a personal social networking site	48	59
Participate in online discussion boards, communities, chats	45	56
Use Web tools for collaborative writing	30	30
Use Web tools to create alerts or notifications for self-organization	24	24
Make videos to share online with others	20	18
Contribute to wikis or blogs about their interests	14	14

- 25 % have used an online video they found to help with homework
- 20 % have used a mobile app to organize school work
- 18 % have taken online self-evaluation assessment
- 15 % have either informally tutored other students or have found an expert to answer their own questions
- 10 % of 6–12 grade students tweeted about an academic topic

We believe that the trend of increased numbers of students using social media and collaborative tools will continue. It will be extremely interesting to watch how districts and schools react to this trend.

Online Learning. The growth in the number of K-12 students participating in online learning continues to grow. According to the report *Keeping Pace with K-12 Online and Blended Learning*: *An Annual Review of Policy and Practice* (Watson, Murin, Vashaw, Gemin, & Rapp, 2012), there were 619,847 students who took a one-semester online course in one of the 28 state virtual schools operating during the 2011–2012 academic year (there were 31 states operating virtual schools in the 2012–2013 academic year). The number of students was a 16 % increase from the previous year (p. 5). The growth in the number of students (275,000, estimated) who attended fully online schools, however, has slowed slightly (p. 5). The single-district blended and online programs were the largest and fastest growing segment of online course types being offered in K-12 (p. 20). The authors reported that, "We estimate perhaps two-thirds of districts are offering some online or blended program, and the large majority have relatively few students and rely on external course providers" (p. 5).

It is interesting to note that in addition to students who took an online course as part of their formal education, according to the *Mapping a Personalized Learning Journey* report (Project Tomorrow, 2012a), "12 percent of high school students and 9 percent of middle school students have taken an online class on their own, not school or teacher directed, to support their learning. In most cases, this online class is a supplement to the student's traditional class and quite often the teacher of that traditional class is not even aware of the student's supplemental instruction" (p. 4). The report goes on to say that there should continue to be a rise in the number of students who participate in these online learning opportunities outside of school considering that 46 % of students surveyed who have not taken an online class

Table 2.2 Percentage of student personal access to mobile devices by grade levels (adapted from Project Tomorrow, 2012a)

Mobile device	Percentage of students in grades K-2	Percentage of students in grades 3–5	Percentage of students in grades 6–8	Percentage of students in grades 7–12
Cell phone with no Internet	18	25	48	49
Smartphone	17	21	37	50
e-Reader	8	9	17	13
MP3 player	33	52	77	82
Tablet device	17	18	26	21

indicated that they would like to and that schools have limited capacities to meet this increased demand (p. 4).

As districts try to meet the demand for the growing interest in online learning, several key issues will need to be addressed. Funding and accountability are two of these major issues (Davis, 2012). Other issues are content acquisition and delivery of instruction. The question districts will need to answer regarding content is whether to build, buy, or license content (or some mixture of the three). Most districts are opting to license content (and entire courses) from companies—with one/two of the top content (and course) types being for Advanced Placement and Credit Recovery (Picciano & Seaman, 2010). Another key issue to address is how will the content be accessible to students? As more online and blending learning occurs in K-12, the use of a learning management system (LMS) in K-12 has expanded with companies like Haiku Learning who has specifically designed an LMS for this market.

One-to-One Computing Access. The growth in student personal access to mobile devices has been a reoccurring trend over the past several reviews, and this review is no different. For much of today's youth, mobile devices continue to be one of the principal ways they interact with and learn from each other (Johnson et al., 2012b, p. 11). The most significant growth was with tablet devices, which saw a significant increase (doubled) from 2010 to 2011 in student personal access to these devices (Project Tomorrow, 2012a, 2012b, p. 6). The second most significant growth was with high school student access to smartphones. Table 2.2 shows the percentage of student personal access to mobile devices by grade levels.

The data indicate that students want to be able to use their devices at school for learning, and if they are not allowed to use their own tools, then they want schools to provide similar access. Fifty-six percent of middle school students and 59 % of high school students would like to be able to use their own mobile devices at school for instructional purposes—while 27 % of grade 3–5 students want to be able to use their smartphone or tablet at school (Project Tomorrow, 2012a, 2012b, p. 7).

As districts wrestle with decreased funding, only a small percentage (10 %) has moved to a model that allows students to bring their own devices for use at school (Project Tomorrow, 2012a, 2012b). Although this movement, known as Bring Your Own Device (BYOD) or Technology (BYOT), is one that students and parents

(62 %) would like to have implemented in schools, 65 % of school site principals surveyed indicated that it was unlikely this would occur (Project Tomorrow, 2012b, p. 9).

We believe that one-to-one access will continue to be a trend. There will be a shift, however, away from providing students with access to laptops to providing access to mobile devices. We also believe that more districts will move to a BYOD/ BYOT approach in order to bring down costs. Other issues, however, will need to be addressed such as upgrading district network to handle the increased bandwidth needed, dealing with interoperability of numerous mobile devices and school IT systems, and providing safe and reliable storage and access of student work (possibly through cloud computing).

Conclusion

In all three areas, corporate training and development; higher education; and K-12 education, investment in educational technologies remains relatively stable, though the current economy dissuades from increased spending and everyone seeks to gain the best possible value for their instructional technology investments. The use of mobile devices continues to increase and K-12 and higher education faculty are striving to do more with the devices students are bringing with them to class just as the corporate sector is increasing its use of E-learning which presumably is addressing multiple, portable platforms. Social media continues to be of particular interest to instruction technologists, but the current trend is away from making formal use of social media in the classroom; students in K-12 and higher education settings are dedicated social media participants, but the survey results of the past year indicate a strong preference to keep this use informal, in particular they wish to avoid using it as means of formal communication with teachers and professors. Personalized learning, students' use of a variety of technologies to access information formally and informally, currently is of particular interest in K-12 and higher education; this dovetails with the increased interest in personal mobile devices. Online learning continues to gain in popularity universally and its continued expansion and acceptance seems to be constant in recent years' trends and issues reports; we anticipate online learning will continue in this manner for quite some time to come, and that the use of mobile devices and interest in personalized learning will strengthen interest in online and E-learning technologies.

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Chapter 3
"Perhaps This Can Be For Education": Learners' Cultural Models for Educational Game Design

Beaumie Kim, Lynde Tan, and Seng Chee Tan

Introduction

The advent of the twenty-first century witnessed a global clarion call for changes in education. Epitomized in educational reports such as "enGauge®21st Century Skills: Literacy in the Digital Age" (North Central Regional Educational Laboratory, 2003) and "Results that matter: 21st Century skills and high school reform" (Partnership for 21st century skills, 2006), strong advocates for developing students' new literacies are emerging. Consequently, competitive economies are developing their own master-plans for technology in education. In Singapore, the Ministry of Education is currently implementing the third nationwide masterplan for technology in education.

In the midst of these changes, policy makers are drawn to the potential of technology for transforming education. Many education systems are equipping schools with necessary technological infrastructure, developing digital resources, equipping teachers with relevant professional development, providing students with equitable access to digital devices, and providing funding for research and development related to the use of technology in classrooms (The United Nations Educational, Scientific and Cultural Organization [UNESCO], 2011). Ironically, research findings on the effects of technology on students' learning outcomes remain mixed (Kulik, 2003). The attempt to use technology as a tool to enhance students' learning, however, relegates technology as mediating tools for the parochial focus on the achievement of academic learning outcomes.

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In recent years, researchers and educators have been putting forward compelling reasons for game-based learning; it has been widely acknowledged that games create more powerful and relevant learning environments than what schools can offer for the digital learners (Becta, 2005; Gee, 2008; Prensky, 2006; Sandford & Williamson, 2005). On the other hand, efforts to integrate entertainment with education have presented challenges when game developers attempt to align educators' specific learning goals with game objectives. In this chapter, we introduce an approach that draws on students' funds of knowledge and practices of playing games and learning in and out of school when developing games for learning. In this approach, learners themselves surface their cultural models related to learning with games. Such intents necessitate a social view of literacy (Barton & Hamilton, 2000; Gee, 2004; Street, 2005) that aims to understand how adolescents take hold of using new media for learning.

Literacy as Social Practice

We take the perspective that developing students' literacy is, by itself, a legitimate and important educational outcome. Literacy is a contested term. It is more appropriate to think about literacy as competing ideologies of what it is and assertions of "particular view[s] on literacy that has implications for how we think about learners, how we think about what they ought to learn, and how this [can] be achieved" (Papen, 2005, p. 12). The notion of competing ideologies of literacy can be traced back to Street's (1984) arguments against the autonomous model of literacy and his arguments for the ideological model of literacy. In explaining the latter, Street and Lefstein (2007) explain that the model:

> stresses the significance of the socialization process in the construction of the meaning of literacy for participants and is therefore concerned with the general social institutions through which this process takes place and not just the explicit 'educational' ones. It distinguishes claims for the consequences of literacy from its real significance for specific social groups. (p. 117)

Street (2001) clarifies that the ideological model of literacy does not deny the development of skills for socioeconomic and cognitive gains, but perceives it as "encapsulated within cultural wholes and within structures of power" (p. 435). In short, Street and Lefstein (2007) explain that literacy entails ideological work when people interact with one another to define what is and is not reading and writing; it imbues values in how and what they read and write and over time, sanctions some ways of reading and writing and marginalizes others.

Street's (2001) notion of ideological model of literacy posits literacy as social practice. Such social view of literacy consists of six tenets, namely:

(a) Literacy is best understood as a set of social practices; these can be inferred from events which are mediated by written texts.
(b) There are different literacies associated with different domains of life.

(c) Literacy practices are patterned by social institutions and power relationships, and some literacies are more dominant, visible, and influential than others.
(d) Literacy practices are purposeful and embedded in broader social goals and cultural practices.
(e) Literacy is historically situated.
(f) Literacy practices change and new ones are frequently acquired through processes of informal learning and sense making. (Barton & Hamilton, 2000, p. 8)

In this chapter, we argue that the viewpoint of literacy as social practice has not been widely adopted for research and literacy education in Singapore; rather, the autonomous model of literacy is strongly invoked. Street and Lefstein (2007) explain that according to this model, literacy is understood as discrete and measurable skills which are independent of their social and cultural context. From this perspective, literacy is learnt and taught as a form of individual development along a carefully charted and predictable trajectory. This chapter sets an agenda to explore the notion of literacy as social practice based on an asset perspective of literacy, first suggested by Robinson and Turnbull (2005). In their study of young children's engagement with mass media and popular culture, they argue that an asset model "assumes that mass media and popular culture content can work as a benefit to literacy" (p. 52). Along the same vein of argument, Moje et al. (2004) highlight the ways the adolescents in their study draw on the "funds of knowledge" (p. 342) from their engagement with media and popular culture when discussing issues related to content learning in schools. It reinforces the importance of accepting and understanding what literacies are socially constructed by adolescents, rather than assuming what literacies they need in any design of literacy pedagogy that claims to bring benefits to the learners.

We focus on adolescent literacies and our use of the term is drawn on Alvermann's notions of adolescence and adolescent literacies that are clearly articulated in many of her works, that is:

(a) The adolescents are not perceived as the "incomplete adults" (Alvermann, 2006, p. 40) and any views that render adolescence as "developmentally deterministic" and "age-biased" (Alvermann, 2002, p. vii) are rejected.
(b) Adolescent literacies refer to the literacy practices of youth who "act provisionally at particular times" (Alvermann, 2006, p. 40) in particular situations within particular aspects of the physical, social, and psychological world.

From this perspective, the adolescents are not necessarily "less competent and less knowledgeable than their elders" (Alvermann, 2006, p. 40). Researchers interested in adolescent literacies point to the shared concern of acknowledging the need to broaden the notion of literacy and learning beyond those sanctioned by schools which adolescents use to shape and empower their lives (Faggella-Luby, Ware, & Capozzoli, 2009; Phelps, 1998). Alvermann (2002) argues that these are the literacies and learning that are yet to be harnessed but may be of value to "any work deemed important in classrooms" (p. xvii).

Games for Learning

Researchers have looked into the affordances of games for learning considering that young people are the "native speakers of the digital language of computers, video games and the Internet" (Prensky, 2001, p. 1). Some proponents of game-based learning such as Gee (2008) suggest that games, for instance, not only provide leisure for young people but may also help young people to develop competences that enable them to participate effectively in the twenty-first century more than traditional schooling. Increasingly, these proponents contend that playing games can be an educational experience and its benefits include developing problem-solving abilities, communication skills, teamwork, leadership, creativity, and computer skills amidst many others (Becta, 2005; Gee, 2008; Sandford & Williamson, 2005). Other studies on computer games in education also contend that computer games not only provide edutainment but themselves are powerful learning environments (Kim, Park & Baek, 2009). Ebner and Holzinger (2007) also argue that in games, learners are able to participate in simulated environments without encountering realistic life consequences.

Recent research suggests that students take more ownership of their learning when they are instrumental in figuring out what to learn. With certain computer games they can become members of epistemological communities (Shaffer, 2006); they can determine what sorts of research and learning resources they need, and use them effectively; they can take advantage of the anonymity of the game platform to participate in collective activities in ways that in a classroom they would be prohibited from (Squire, 2005): they develop informal but effective literacies depending on the situation they're in inside a game (Gee, 2008). Computer games, especially those played from home that feature role playing or avatars, flatten social differences and allow students to participate as active agents in learning the materials needed to succeed in the game. So for every hour "wasted" playing Halo or Harry Potter RPGs, other hours can be profitably spent in computer gaming, learning architecture, family planning, or interior design from The Sims, the complexities of urban planning in Sim City, world history in Civilization III, or managing economies, cities, populations, and armies in Rome: Total War (Squire & Steinkuehler, 2005). Well-designed games enable the players to learn as they play; they also motivate players to persevere (Gee, 2008).

Several educational game development laboratories are trying to augment the offerings of commercial computer games. David Shaffer's work of designing epistemic games encourages students to play the role of urban planner and behave like a professional planner to solve a problem through research, consultation, mastery of a particular vocabulary and outlook (Shaffer, 2006). Augmented reality games lure students into playing roles to solve problems in their real-world surroundings, thus becoming more conversant with the complexities of real-world problem-solving (Klopfer, 2008). All these educational computer game endeavors share a common theme: the student is not simply a recipient of knowledge, but an active solver of problems in a particular area.

Yet, there is a body of research that highlights the challenge of meeting teaching and learning needs using educational games. Kim et al. (2009) argue that maintaining a balance between learning and entertainment is challenging when using games for teaching and learning. Gee (2008) also highlights that there often is meaningless play in computer games, which do not necessarily provide learning contents that encourage intellectual pursuits even if they are intended for use in education. Becta (2005), although brings our attention to the educational benefits in using games for education, also cautions that the educational focus can be easily lost when learners are distracted by the game interface. In short, the context of the game (such as the scenarios depicted, the activities or the game interface) is often disparate from the learning aspects in many "educational" games. Some researchers have approached this issue by seeking pedagogical values of features within the augmented reality gaming platform (Klopfer & Squire, 2008), by matching instructional design and game design (Gunter, Kenny, & Vick, 2008), and by closely aligning game tasks with educational goals (Shelton & Scoresby, 2011). For us, we adopt the stance of understanding pedagogical design for educational game development by first gaining insights about the learners' practices of playing games and learning.

Understanding Learners' Cultural Models Through Informant Design Approach

Elsewhere, two of the authors of this chapter, Kim and Tan, have argued that pedagogical goals of games-based learning in classrooms are achievable when game developers draw on learners' cultural models about their lifeworlds through the informant design approach (Kim, Tan, & Kim, 2012). Gee (2008) explains that cultural models are "stories or images of experience that people can tell themselves or simulate in their minds, stories and images that represent what they take to be 'normal' or 'typical' cases or situations … We act with others and attempt to make sense of what they are doing and saying. We interact with the media of our society and attempt to make sense of what is said and done there, as well" (p. 146). We accord with Gee's (2008) definition and understand cultural models for educational game design as follows:

(a) Cultural models are tacit knowledge.
(b) Cultural models are indexical of one's literacy practices.
(c) Cultural models are frames of reference for social actions.

In Polanyi's (1967) book, "The Tacit Dimension," he asserts that "we can know more than we can tell" (p. 4). According to him, there lies a type of knowledge that is hard to verbalize, codify, and transfer to others. It is, therefore, tacit as it involves the "how-to" in a taken-for-granted manner; such implicit knowledge is acquired through experience and interactions with others in a shared community. Polanyi further explains that one's tacit knowledge is embodied knowledge that consists of one's beliefs, ideals, values, and mental models of how things are done in a community. When thinking about learners' cultural models for educational game design, we assert that learners hold tacit knowledge about school practices, the ideological practices characteristic of the specific ways of participating in literacy events in the routine school life (Barton, 2007) as well as out-of-school literacy practices which refer to the ideological practices that are characteristic of the diverse ways of participating in literacy events outside institutionalized settings (Tan, 2010).

Building on Polanyi's assertion about tacit knowledge, it can be argued that cultural models are indexical of one's literacy practices. From this perspective, cultural models provide insights on how the learner gives meaning to literacy events, conceptualizes and values literacy and learning, based on their knowledge and beliefs. They do not exist in the individual's mind but are socially constructed through interactions with other people, media, and texts (Gee, 2008). Bartlett and Holland (2002) argue, "cultural worlds are continuously figured in practice through the use of cultural artifacts or objects inscribed by the collective attribution of meaning" (p. 12). Artifacts of learning, such as games designed by learners, are "traces of social practice" (Pahl & Rowsell, 2005, p. 199) and they serve as "resources for seeing and understanding" the adolescents' world; they symbolize the practices bound to the particular social and cultural contexts with the assumed roles and relationships of the participants involved in the settings (Street, 2008, p. 7).

Gee (2005) uses Discourse (with an uppercase "D") to refer to "ways of acting, interacting, feeling, believing, valuing, and using various sorts of objects, symbols, tools, and technologies" (p. 7) as "ways of being in the world" (p. 7). It can be argued that his use of Discourse is intended to stress how social practices are capable of shaping and being shaped by one's way of being. Adolescents' engagement in their literacy practices has given them certain experiences of participation. Being members of their school and other communities (e.g., gaming communities), their lived experiences had positioned them to be a certain kind of learner or student. Their cultural models tell people of a particular Discourse of learning. Cultural models are thus "frames for reference" (Holland, Lachicotte, Skinner, & Cain, 2001, p. 52) that govern learners' actions on how to be the model student, learning what is deemed good and right as well as what is not. Specifically, with respect to cultural models for educational game design, they govern the learners' ideas on what counts as educational games and what does not.

We examine learners' ideas about games and learning that disclose their cultural models about their lifeworlds through informant design. In this approach, the learners are not user-testers called upon only at the final phase of game development; instead, they act as key informants of design decisions because their ideas and experiences with games and learning are drawn upon to develop the game at its various phases of development (Kim et al., 2012). In our efforts to understand learners' ideas from the workshops, we look for such stories or images they bring in, i.e., cultural models. We believe their cultural models affect their ways of thinking about learning and gaming using their funds of knowledge (González, Moll, & Amanti, 2005; Moll, Amanti, Neff, & Gonzalez, 2001) as resources for the design. Facer and Williamson (2004) advocated co-designing educational technologies with target learners using *informant design approach*. In this approach, game developers should create their own appropriate strategies to leverage learners' ideas and experiences with games and learning throughout the different phases of game development, rather than engaging them in user-testing at the end of the game development.

Similarly in the informant design approach, we positioned students' own ideas as the best resources not only for their own learning, but also for the design of learning tools (Kim et al., 2012; Kim, Tan, & Kim, 2010; Wang, Kim, & Kim, 2011).

Five Progressive Workshops in Informant Design

In this chapter, we draw on the study conducted by two of the authors of this chapter, to specifically highlight learners' cultural models of learning. The study involved developing a 3D multiuser game, called the Voyage to the Age of Dinosaurs (VAD). The theme of dinosaurs, focusing on fossilization, was found appropriate for approaching the topics of the Earth's processes. The game was intended to be used within the school Geography curriculum to address contents related to the Earth's processes, and provide learners with alternative ways of experiencing Earth processes as part of a complex whole and support understandings of the relationships among geological events.

Five progressive design workshops were developed and implemented as part of the three-year research program with two Singapore secondary schools (see Fig. 3.1). Twenty-two students between the age of thirteen and fifteen participated as design partners. The earlier part of the design workshops has been introduced in the 2011 Yearbook (cf., Tan, Kim, & Yeo, 2010). These workshops explored ways to generate learners' ideas about our Earth and computer games as important resources for the educational game design. These activities included problem-solving activities related to earth sciences, creating game scenarios, playing and making suggestions to improve game prototypes, and designing game quests.

In the following section, we describe how groups of adolescents made explicit their cultural models about games and learning, using the key findings of the study. The discussion centers around the three interrelated themes emerged from the analysis of video/audio data of the adolescents' interactions and learner-created artifacts, i.e., learning, technology, and aesthetics. These themes are discussed separately for the purpose of extracting design issues around them, but they are closely interrelated to one another.

Learners' Cultural Models of Learning, Technology, and Aesthetics for Educational Games

Learning

In terms of cultural models of learning, three main issues emerged from the data: ideas as correct information versus their own conceptions; learning as answering questions versus accomplishing tasks; and learning as reading information versus

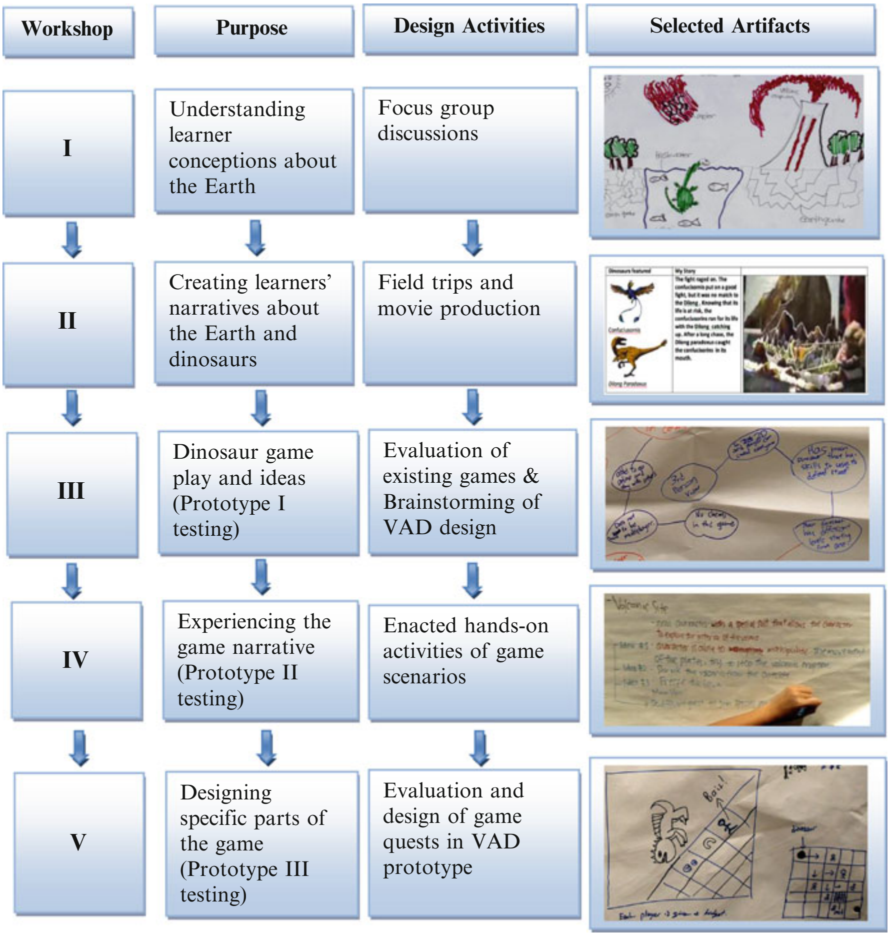

Fig. 3.1 Five phases of informant design workshops

finding solutions. The data show that learners' existing cultural models on how learning only took place through overt instruction by the adults (such as teachers and parents) were continually challenged throughout the informant design workshops.

Ideas as Correct Information Versus Their Own Conceptions

In the efforts to listen to learners' own ideas about educational game design, their cultural models on how they believed they had gained knowledge and understanding surfaced. Specifically, when asked for possible game ideas, learners regarded the notion of ideas as information they could recall. During Workshop I, learners often tried to reproduce what they could remember from books, media, and remarks

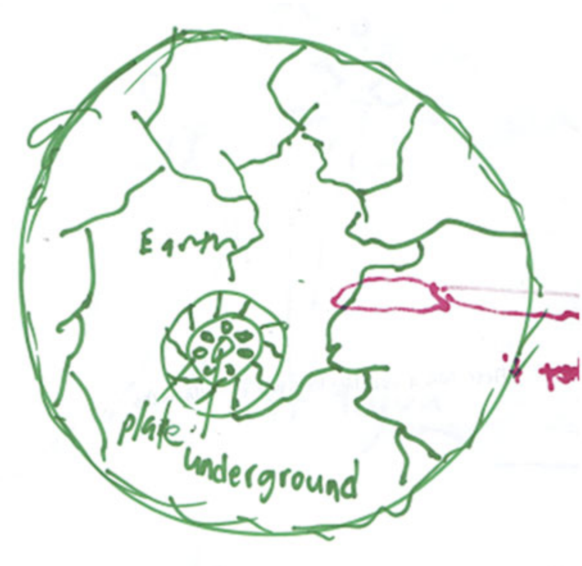

Fig. 3.2 Example of Workshop I drawing

by authoritative figures such as teachers and parents. During a discussion on volcanic eruption, some students engaged in a conversation on if their teachers had taught that topic. For example, Matt said, "*I don't know how volcano explodes. My primary six teacher say before.*"

Learners, even though they thought they were representing information gathered from authorities, formed their own conceptions based on such information (Tan, Kim, & Yeo, 2010). For example, one of the participants named Victor drew Fig. 3.2 to explain how an earthquake might happen: "*My mother said that the blades move, then it shakes the ground which will start to crack.*" It seems that he heard "plates" as "blades" and created an interesting image about the cause of earthquakes. In another example, students were developing a story and a short film about dinosaurs and their fossils in Workshop II. Some initially looked for good "answers" by suggesting imitating what the research team had provided as an example. However, even though Tony said, "*Let's copy teachers' one*" to the T-Rex group members, they came up with their own unique plot and interesting methods of expressing various events.

Learning as Answering Questions Versus Accomplishing Tasks

Workshop III and IV data show some conflicting discourses about how players could learn in games. This was apparent when comparing their suggestions to VAD prototypes with their ideas for "hottest game in town". When asked to design the "hottest game in town" involving dinosaurs in Workshop III, they focused on how they should have challenging tasks to improve their skills and acquire more advanced tools. This meant that they wanted to become a better game player by playing the game.

Fig. 3.3 VAD prototypes I and II. (**a**) Prototype I, a volcanic mountain and Dilong (Tested during Workshop III). (**b**) Prototype II, a dinosaur and a freeze gun (Tested during Workshop IV)

On the other hand, as a suggestion to improve VAD prototype I[1] and II (see Fig. 3.3), some proposed having many stages to complete by answering questions correctly, which mirrored knowledge "testing" culture of schools (and/or many "educational" games). During Workshop IV, some suggested using questioning of knowledge in the context of players advancing within the quest or to the next level. One group suggested, *"Assemble the fossils after the excavation. Take them to Dr. Kong Long. He will test your knowledge on fossil and dino rocks and dinos. If you gain xx points, you will advance to some time-traveling expedition. But if you don't, you will lose all your points and fossils."*

In VAD prototype II, players could earn Experience Points and lose Health and Life points—if players lose life, they were sent to the Health Camp, where they could consult a Dinopedia and complete quizzes on volcanoes and rock types while "recovering," before they returned to active play. In this case, students took on their "gamer" hat and criticized the overt nature of the pedagogy in the Healing Camp (i.e., solving quizzes and puzzles to restore their lives). They also wanted the Healing Camp to be a more of training ground where they could practice shooting dinosaurs, which would help them do better in the game.

What they had suggested indicated how learning in games happens incrementally through practice and multiple achievements (Gee, 2008) where learners repeat the same activities (i.e., searching & assembling fossils, being tested by the key character in the game, keeping themselves from dying, and shooting dinosaurs) until they are successful so that they can earn points, improve skills, and move on to subsequent levels. While designing games for learning, students made attempts to

[1] The first VAD prototype was developed within the storyline of searching the fossils and seeing dinosaurs in action similar to those of students' from Workshop II. Players met Dr. Kong long who, in this first prototype, asked their help to save Dilong (a feathered from early Cretaceous period). They first collected fossils to open the portal to the past, where they found information about volcanoes' structure and kinds from the past, and saved Dilong and themselves from the volcanic eruption.

bridge their game play (outside school) with school learning (i.e., by suggesting question-and-answer part for the game). For them the ways of "gaming" (i.e., learning skills by playing) seemed to suggest a separate regime from that of "learning" (i.e., gaining knowledge to be tested).

Learning as Reading Information Versus Finding Solutions

Additionally in Workshop IV, students' suggestions were looking for more challenges and discovery, which would allow them to have different achievements depending on how they played the game. For example, one group suggested a narrative where the "*[t]ime Machine spoil: everyone find materials to build time machine*." Another group wanted to discover various things as they progressed by having "*[h]idden passages, traps, hidden eggs, time-traveling expeditions, weapons to be found on the floor*." For the things they needed in order to advance and gain points for the game play, they expected themselves to explore the environment and find these resources themselves. On the other hand, students suggested the objects, characters, and the environment to embody information for educational purposes. They said, "*Upon capturing of dino, the info will be in the logbook/displayed on screen for 2–5 min* (*forced to read*)" and "*Labeling species of dinos*".

They were suggesting that the main things to learn in the game were the information about various kinds of dinosaurs, which links to their other gaming experiences. Their suggestion resonated with Gee's (2008) "Material Intelligence" Principle of learning (i.e., knowledge is stored in the environment and objects). For instance, in many online game forums for monster-appearing games that they had played, one of the main information shared and sought for were the list of different kinds of monsters (e.g., MapleStory). Dinosaurs' species are also important information in understanding evolutions of various animal species and highlighted in many existing media (e.g., books, TV shows, movies, games, museum displays). At the same time, they showed their conflicting cultural models about learning in that the "reading" had to be forced in order for it to happen (and is important enough). In the short excerpt of students' conversation below, it is notable that in the midst of their effort to bringing in educational purpose in the game ideas, they kept drawing on their cultural model of dinosaur as a gigantic and violent creature that was a good fit for their monster image of games:

1. Ken: Perhaps this can also be education. Like, for example, you gather the DNA of different dinosaurs then introduce dinosaurs.
2. Nick: But, then when you get back to the present right, then a GIANT dinosaur follow you, then it is the boss stage[2] (waving hands around to show that it is big).
3. Researcher: Boss stage some more? Haha (all start laughing).

[2] They were referring to a battle or fight with a character. In games, boss stage is generally seen at the climax of a particular section of the game, usually at the end of a stage or level. The boss enemy is generally far stronger than the opponents the player has faced up to that point (Wikipedia 2011).

Although some students were excited about fighting bigger and stronger dinosaurs (turn #2), there were some who reconciled the perceived divide between gaming and learning, by suggesting how to seek important information themselves in the game (turn #1).

Technology

In terms of students' cultural models of technology, students focused on using technology to extend their capabilities or impact situations with power. In Workshops III and IV, students suggested using technology to gain power for fighting, selling, competing, and gaining rewards. These ideas reflected their cultural models of video games, which we elaborate in the following.

Extending Their Abilities

When students began to explore what they could do through the game in Workshop III, they started searching for a new, powerful identity that could control or change the situations in the game, and certain forms of violence that reflected what Gee (2008) has called, "psychosocial moratorium" principle. For example, one of the teams anthropomorphized dinosaur characters, making them intelligent enough to develop a time machine and attack people in the future. They also discussed various weapons (e.g., FireGun, IceGun, WindGun, FreezeGun, Rocket Launcher, Bombs, Big Nets, etc.) to kill opponents or dinosaurs and earn points, which they could perform safely in the game world, unlike the real world.

Students' ideas also show that they had valued having an empowered identity that could overcome various dangers and challenges. In Workshop IV, most of them suggested having more power to control the situations and looking stronger. One group's idea was that their actions would achieve alternating identities: "*Transform into dinosaur: save eggs → egg hatch → baby dinosaur (companion) → adult* (*switch between dinosaur/human*)". Students, at this stage, were throwing out their ideas without necessarily considering the consistency with the game plot. Below is a short excerpt from this group while they are discussing the transformation. After discussing various possibilities including dinosaur DNA from its bones and DNA suits and finding dinosaur eggs, one of our research members tried to clarify students' intention.

1. Researcher: So you can switch between characters? Switch between dinosaurs and humans?
2. Ken: No. But since you, when gather the DNA, then you can change to the dinosaurs.
3. Weibin: Use it as a mount. Can ride on it…
4. Ken: Maple!

In this excerpt, Weibin in turn #3 suggested another idea of using the dinosaur as a "mount", a common item in popular online games, such as MapleStory and WOW.

Gamers are able to ride on various types of mounts, and stronger and faster mounts can be obtained when reaching higher game levels. Ken (turn #4) immediately pointed out where Weibin's idea might be coming from. They used and saw the intertextuality between their idea generations and their gaming experience. This shows their cultural models of dinosaurs as physically strong creatures, and gaming as enabler to extend the players' abilities by making use of the creatures' abilities.

Impacting Situations with Power

Over the course of working with these learners, we have seen them getting excited about expressing some form of powers (and violence) during the workshop activities. Figure 3.4a shows a drawing by one of the students during Workshop I, which accompanied his story about a fossilized mesosaurus' possible life and death. Using colors and lines as tools in his drawing, he illustrated violent eruption of a volcano, which marked the death of the mesosaurus and the beginning of its fossilization process. During Workshop II, a group of students shook the video camera and threw a reddish color disposable raincoat (for heated volcanic materials) to express the tremor and the eruption of the volcano (see Fig. 3.4b).

Continuing with the theme of volcano's power affecting the situations, they suggested more interactions with the volcano in the environment within the game in Workshop IV. Students not only voiced out their proclivity to powers and powerful events, but also started bringing out their agency in suggesting how to use the power in a meaningful manner to bridge it with learning in the way that they are familiar with. One group suggested a quest related to the volcano in the game, such as:

- *Main idea: 1. Do different quests to gain special power to be able to do this quest (time-based); 2. Stop volcano from erupting*
- *Arm character with a special suit that allows the character to explore the interior of the volcano; Character is able to manipulate the movement of the plates, try to stop the volcanic eruption; Shrink the volcano from the outside; Freeze the lava*

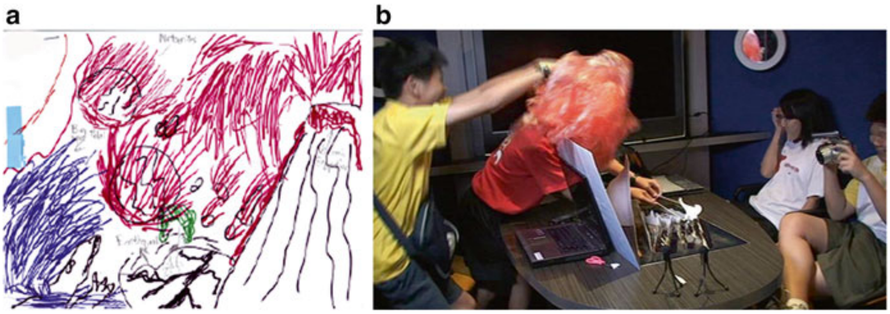

Fig. 3.4 Representations of volcanic eruption from design workshops. (**a**) A student's drawing about his mesosaurus story (Workshop I). (**b**) Shooting a volcanic eruption scene (Workshop II)

The suggestions about volcano and movement plates may have intertextual meanings for this particular group of students because the VAD prototype I (see Fig. 3.3a) had a task of stopping volcano from the eruption and the current workshop had a hands-on activity of moving plates (through the use of jelly). At the same time, in VAD prototype II, we included "guns" that were not intended for killing dinosaurs, but capturing them through freezing, shrinking, and netting without harming them (see Fig. 3.3b). They turned those guns' capabilities into the ones with which players could control one of the most powerful and dangerous natural disasters. This suggests that some of students' ideas were borrowed from those experienced in the workshops since interactions with such dangerous environment might belong to the same genre that they were looking for in the game.

Aesthetics

What appeals to teenage learners is not only affected by contents and interactivity, but also by aesthetic values they uphold. At the same time, their lived world is filled with information and practices that exist in varying domains of social practices (i.e., home, school, society, etc.). One of the aims of aesthetic computing is to improve the emotional and cultural level of interaction with the computer (Norman, 2004). In every artifact students have produced, there is reflection of their aesthetical values, especially in how they have embedded their emotional ties in their designs, how they have performed identities through outward appearances, and how they have situated meanings of activities in context.

Expressing and Enabling Emotions

In explaining his drawing (Fig. 3.4a) during Workshop I, a student was telling the researcher, *volcanic eruption blowing up everything, small little stones flying everywhere*, with excited tone of voice. The volcanic eruption he illustrated with colors and lines was also representing his emotions around the violent disasters. In Workshop II, as seen in Fig. 3.4b for example, participants brought in their own "artifacts" and representations to the dramatic effects. A student drew and attached a mustache to identify himself as a paleontologist in a scene. Some also downloaded music from a horror movie to play during the dinosaurs' fighting scene expressing the fearsome feeling of the prey.

Students' concerns about the aesthetics of the game prototype were most related to the identity that the avatars provide and how meanings of their actions are situated in the game context, which may not directly affect their game play. In Workshop IV, they wanted avatars' looks to reflect their attributes (e.g., strength, speed) of the characters. They also suggested adding more indications that relate to what they experience in the game—"*Emotions: Characters. Expressions—Angry and dance. Have background music*". The emotional expressions they used in earlier workshops do translate into the suggestions they make for the VAD prototypes. The voices of students that call for "emotional design" are important to consider because such design may help learners to direct their emotional and cognitive resources to learning situations and to have more meaningful engagement (Kim et al., 2010).

Accessorizing the Game

During Workshop IV, students made some detailed suggestions of having more non-player characters (NPCs) situated in the environment—"*Pet dino that can fight with you; Meet cavemen*", and some items special to this particular scenario—"*Dino weapons* (*made from items you collect from dino*) *E.g. Dinozuku, claws/fangs, Dino sword*". Having dinosaurs as players' pets was drawn from their home gaming experiences. In the popular games as *MapleStory*, players can buy pets with different appearances, attributes, and levels.

For VAD, students were suggesting many things that could accessorize the game with varying dinosaur-related items. When they were asked to extend the scenario of the game, which ended by telling them they were trapped in the past because of some problem with the portal to the present, students also wanted to put the continuing scenario into the dinosaur-related context:

1. Ken: They, they claim we are stuck in the past
2. Danny: So the mission is to find the time machine
3. Nick: No, everyone try to build a time machine then everyone find the materials…
4. Ken: (Weibin typing and Ken giving words) to build a… to build a…a… a time machine
5. Researcher: Ok, so what types of materials do you want to find?
6. Ken: Bones, dinosaur bones

When Danny (turn #2) suggested the mission to find a time machine itself, Nick (turn #3) suggested something more sophisticated (i.e., finding materials to build a time machine). When the researcher asked them to elaborate on the materials being sought for (turn #5), Ken answered that they were bones of dinosaurs (turn #6). In this case, they probably had not thought deeply about why dinosaur bone could be an important material to build a time machine. Similar to the "dino" weapons suggested by some groups, students were very much excited about turning various items' surface features into dinosaur-related ones.

Discussion: Cultural Models and Game Design

This research started from understanding their cultural models related to the concepts and stories about the Earth and dinosaurs, and shifted toward asking them to expand the story and concepts in the prototype using their own ideas. In the effort to bring learning, technology, and aesthetics together, “Volcanism” became the first learning topic in the first VAD prototype (tested in Workshop III; see Fig. 3.3a): learning through interacting with volcano; virtual volcano embodying the concept; eruption as simulated power; tools to get closer to the volcano; emotions related to volcanic eruptions; and the artistic creation of 3D volcano. Not only many of the students were excited about volcanoes in the first two workshops (I & II), but also many discovered and intact fossils are composed of volcanic ash sediments.

It could be inferred that their cultural model of learning characterized learning as a regurgitation of bounded knowledge and undebatable facts from authoritative sources. This is the Discourse of learning that was observed in classrooms designed on a cartesian view of learning where knowledge is understood as a discrete entity that can be transferred from one person to another and learning involves mastery of explicit and measurable knowledge (Brown & Adler, 2008). Nevertheless, over time, the adolescents in the study had shown that they were capable of reading, seeking, and evaluating information on their own when encouraged to do so (Wang et al., 2011). Learner agency was heightened in such playful experience of creating game narratives, short films, developing quests, and participating in other informant design activities. Their ownership and motivation to devise their own solutions progressively emerged from their collective engagements in the activities, which characterizes learner agency (Damşa, Kirschner, Andriessen, Erkens, & Sins, 2010; Tan et al., 2010).

When we first asked them to come up with game design ideas in workshop III, it was apparent that students see “hottest” games very differently from “educational” games. Even though they knew that what our team had developed was for educational purposes, their ideas were mostly focused on what was exciting for them. However, they started to see the problem in their designs when providing feedback to one another: one student gave feedback to the sharing group by saying, “Hey, the game is supposed to be educational. You have too much killing going on!” The second VAD prototype (tested in Workshop IV), therefore, tried to incorporate and, at the same time, challenged students’ cultural models about games and learning. For example, players could “lose” life not by fighting, but by poisonous gas from volcanic eruptions; and players would use a series of four specialized “guns” not to “kill” but to capture the dinosaurs (the guns would freeze, shrink, net, and cage the dinosaurs) alive in order to bring them to the present world. These guns would be the means for collaboration rather than for competition among players (see Fig. 3.3b).

McLuhan (1964), recognized by some as the father and prophet of the electronic age, once foretold that making a distinction between education and entertainment indicates the ignorance of both. Align with McLuhan’s assertion, Jenkins, Purushotma, Weigel, Clinton & Robison (2009) also argue that play inherently brings in the “capacity to experiment with one’s surroundings as a form of problem-solving” (p. 35). In our informant design workshops, we are able to access learners’ preconceptions which are necessary for further knowledge construction and understanding of the concepts they pursue. This is done in a playful learning environment, rather than a testing one. Such environment opens up learners’ cultural models of learning which act as necessary prior knowledge, similar to what Comber and

Fig. 3.5 Prototype III, navigating using compass bearings (Tested during Workshop V)

Kamler's (2006) call "virtual schoolbags" (p. 23) packed with resources that can be used for learning. During the earlier workshops, the adolescents had the opportunities to create artifacts related to earth science learning and game design without too many parameters provided for their tasks. As they start putting down their ideas about "hottest" game in town, they created and reflected on how learning should happen, and how they would like to look and act in a game using their own resources from their gaming and school learning experiences.

During the workshop IV and V, on the other hand, students were much more critical about the prototype, made more efforts to connect learning with game, and even provided more detailed recommendations on making use of shared grammars from commercial games. The third VAD prototype (tested during the workshop V) tried to incorporate their suggested game components and overcame the division between the game contents and the curricular content (navigations and maps). Commercial games require players to use maps and navigate in the virtual worlds in ways that are somewhat different from how they are taught in geography lessons. In the effort of bridging geography learning, game play, and real-world navigation, we designed a quest so that players would get to various locations using clues (such as compass bearings and landmarks) and figure out the features of the specific locations (e.g., elevation) in order to obtain the directions to meet a character or collect necessary tools (see Fig. 3.5).

In retrospect, we see that our effort had shifted from understanding learners' cultural models to relying on them for designs. Especially in the earlier workshops, we often heard their competing voices in their discourse, with which they mixed ideas from adults with their own interpretations and sought for correctness or appropriateness of their ideas. We saw the participating students using their cultural models about gaming and learning in their design ideas to merge such competing ideas together. For instance, they voiced out their propensity toward having a great deal of power in games, and they started showing their agency in adapting the usual destructive power in commercial games to the use in a meaningful manner to bridge it with concepts (i.e., volcanism and plate tectonics). Students' identity as designers and people who could share and express their own cultural models became much more apparent. They no longer believed that researchers were expecting them to produce correct answers.

Conclusions

We contend that the public debate on literacy and learning in Singapore strongly suggests that the residing view of literacy invoked by the Singapore Ministry of Education is predominantly based on the autonomous model of literacy, a term first coined by Street himself in 1984 (Street & Lefstein, 2007, p. 97). It is defensible to understand the literacy model in Singapore in this way because Singapore operates in an ability-driven education system (Sharpe & Gopinathan, 2002) and a premium on knowledge and skills continues to be the focal point in education policy debates. The autonomous literacy model is visible in the way literacy is enacted in Singapore's schools. Literacy in Singapore is known as "back-to-basics and literacy-as-lock-stepped-processes ways of reasoning" (Kramer-Dahl, 2008, p. 94). Luke et al. (2005) have reported that secondary teachers view literacy learning as a linear straightforward process and return to teaching of basic skills to remediate what students do not master in their earlier years of instruction.

Literacy in Singapore has also been restricted to formal school education with the aim of preparing students for the national examinations (Sharpe & Gopinathan, 2002). Literacy tasks are therefore often designed without making reference to cultural resources the students can draw upon (Botzakis & Malloy, 2005; Kramer-Dahl, 2008; Sripathy, 2007). In school literacy practices, assessment is predominantly summative. This is characterized by high stakes and standardized testing within educational systems. Summative assessment or assessment of learning, as it is known, is influenced by the autonomous model of literacy which we argue is at odds with the world outside the classroom where learning is social and situated. The purpose of assessment determines what, when, and how it is done (William, 2010). We follow the argument put forward by Shepard (2000) that such mode of assessment is no doubt necessary but not enough to enhance learning. Citing Shepard (2000), "[W]e have not only to make assessment more informative, more insightfully tied to learning steps, but at the same time we must change the social meaning of evaluation. " (p. 10).

When designing education fit for the twenty-first century, we are usually familiar with the cultural models of learning in schools. Leveraging on learners' embodied experience in and out of school (including game play and other experiences) has several advantages. First, we are closer to creating game scenarios and activities that have interesting plots that appeal to the learners. Second, we can have a better access to the learners' preference for the kind of social interactions they desire (online, offline, and in/out of game play). Third, we can be more sensitive to creating a learning environment that anchors in the kind of gaming experience and everyday learning experience that learners can relate to. Lastly, we can continue with our aim of integrating conceptual learning into a gaming environment and learning activities that engage learners in learning by reflective playing.

Out-of-school literacies, such as playing computer games, therefore, may not be as deficit as they appear. To harness the wealth of learners' prior knowledge, we need to treat adolescents' out-of-school literacies as an asset for school learning (Comber & Kamler, 2006; Moje et al., 2004; Street, 2005). Based on the learners' cultural models presented in this chapter, it is evident that learners recognize the division as well as the connection between the school and out-of-school practices. They are able to "think consciously and reflectively about some of their cultural models of learning and themselves as learners, without denigration of their identities, abilities, or social affiliations, and juxtapose them to new models of learning and themselves as learners" (Gee, 2008, p. 211). To design literacy pedagogies without drawing on their cultural models, we are developing policies, programs, and education based on assumed needs; rather, we could have drawn on their cultural models of their lifeworlds to design learning that is agentive, constructive, and formative.

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Chapter 4
Implementing Problem-Oriented Pedagogies in Engineering Education: Examination of Tensions and Drivers

Angela van Barneveld and Peggy A. Ertmer

Introduction

In 1918, Mann reported, "engineering education will never be satisfactory until theory and practice are taught simultaneously" (p. vi). While engineering schools have embarked upon a path of educational reform in order to meet the needs of twenty-first century engineering (Galloway, 2008), significant opportunities remain to integrate knowledge, skills, and attitudes in the development of engineering graduates. The demands on engineering educators are high; they are being challenged to create learning environments that not only teach technical skills effectively, but also incorporate process skills such as self-directedness, teamwork, and communication skills (Shuman, Besterfield-Sacre, & McGourty, 2005). While technical knowledge and skills make up the bulk of current engineering curricula (Trevelyan, 2008), industry is demanding a new type of engineer with skills that go well beyond technical mastery (Duderstadt, 2008).

Engineering schools are challenged to prepare engineering graduates for professional practice and to help them transfer knowledge and skills to practice (Aparicio & Ruiz-Teran, 2007; Savin-Baden, 2008; Stinson & Milter, 1996). Of particular note is that traditional approaches to education (teacher-centered, lecture-based) have done little to prepare students to address complex real-world problems (Brodie, Zhou, & Gibbons, 2008). Education has seen a progressive shift, at least in theory and intent, away from the traditional teacher-centered instructional approach toward a more learner-centered approach (Bransford, Brown, & Cocking, 2000). Learner-centered pedagogies support active and collaborative engagement of students and are designed to promote deep learning and sustained knowledge and skills development (Biggs & Tang, 2007; Ramsden, 2002).

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Problem-based learning, a learner-centered pedagogy, has entered the realm of engineering education under various names—problem-based learning (PBL; Brodie et al., 2008; Butun, Erkin, & Altintas, 2008), project-based learning (PjBL; Edward, 2004; Lima, Carvalho, Flores, & van Hattum-Janssen, 2007), and problem-oriented project-based learning (Lehmann, Christensen, Du, & Thrane, 2008). The call for increased design-based curricula in engineering education (Sheppard, Macatangay, Colby, & Sullivan, 2009) is also reflected in newer curricular strategies such as Conceive–Design–Implement–Operate (Crawley, Malmqvist, Östlund, & Brodeur, 2007). The effectiveness of problem-based pedagogies has been demonstrated, including in the domain of engineering, for long-term knowledge retention, skill development, and student and faculty satisfaction (Strobel & van Barneveld, 2009), as well as increased motivation and engagement of students, increased self-directed learning skills, and an increased integration of theory and practice (Hmelo-Silver & Barrows, 2006; Ribeiro, 2008).

Barrows (2002) described PBL as including four key components: problems are presented as they would appear in actual practice (ill-structured); learners are accountable for determining their own learning needs; the instructor serves as a facilitator; and problems are selected based on their likelihood of being encountered in real-world settings. Savery (2006) defined PBL as "…an instructional (and curricular) learner-centered approach that empowers learners to conduct research, integrate theory and practice, and apply knowledge and skills to develop a viable solution to a defined problem" (p. 12). Like Barrows, Savery emphasized that problems needed to be ill structured and, ideally, interdisciplinary.

In the context of this chapter, our definition of PBL is informed by these definitions, but remains intentionally broad and inclusive of other problem-focused pedagogies. Barrows' taxonomy of PBL methods (Barrows, 1986) acknowledged the different ways that PBL could be implemented, based on variations in context and objectives of the particular learning environment. Therefore, in this chapter, PBL is described as learning that is supported within an environment that makes use of ill-structured problems as the basis for developing technical and process knowledge and skills, as well as professional attitudes. Jonassen, Strobel, and Lee (2006) described ill-structured problems as having vague goals and undefined constraints with multiple possible solutions, requiring learners to make judgments and to justify actions and outcomes.

In the pursuit of reform, the role of engineering faculty as the implementers of pedagogical change is critical (Barr & Tagg, 1995). They are, to a large extent, the instigators of reform within their classrooms and the implementers of innovative pedagogical approaches. According to Inderbitzin and Storrs (2008), most engineering educators implement PBL of their own accord and in an incremental fashion. From an activity theory perspective, the introduction of a new pedagogical approach in the classroom system brings with it a set of tensions (Engeström, 2001). Tensions may arise within each level of the system, as each may have its own goals, rules, values, processes, and procedures that facilitate or constrain the interactions within and between systems.

PBL implementation in engineering education challenges conventional, familiar, and habitual perspectives held by traditional educators and their discipline-specific teaching practices (Murray & Summerlee, 2007). As such, the adoption of PBL necessitates a new way of conceptualizing teaching and learning. Additionally, because the classroom activity system is nested within a larger activity system that carries its own goals, values, culture, structure, processes, and procedures, tensions arise within and between these embedded activity systems. As such, the individual educator is expected to manage and negotiate his/her own path.

In this chapter we examine the different tensions engineering educators experience related to the implementation of PBL, and consider why they still make the decision to adopt PBL. Our goal is to provide not only insights into the experiences of engineering educators implementing PBL in their teaching practices, but also to enrich our understanding of how to improve engineering pedagogy, particularly the implementation of problem-oriented pedagogies.

Engineering Education for the Twenty-First Century: The Need for Reform

Stakeholders of engineering education, including professional organizations (National Academy of Engineering, 2005; Royal Academy of Engineering, 2007), industry (Arlett, Lamb, Dales, Willis, & Hurdle, 2010; McMasters & Komerath, 2005), and educational institutions (Crawley et al., 2007; Woods, 2006), have directed significant efforts to establishing criteria for the engineer of the twenty-first century. To promote this new vision of the twenty-first century engineer, professional organizations have produced a set of recommendations for reforming engineering education to meet societal and global needs into the year 2020 (ABET, 2009; National Academy of Engineering, 2005). The 2009–2010 *Criteria for Accrediting Engineering Programs* listed 11 program outcomes (ABET, Criterion 3), over half of which comprised process and nontechnical skills. These recommendations included, but were not limited to, a new focus on the development of future engineers' process skills such as the ability to work on multidisciplinary teams, solve problems, think critically, understand the domain of engineering (ethics, professionalism), communicate effectively, engage in lifelong learning, and gain an awareness of global issues and an understanding of how engineering can impact those issues in both the present and future. Reflecting on the demand for students to meet these criteria, Felder and Brent (2003) noted, "problem-based learning can easily be adapted to address all eleven outcomes of Criterion 3" (p. 15).

According to Mias (2008), there are "…vociferous complaints [among engineer employers] for the failure of the university to provide suitably qualified graduates" (p. 13). Industry is seeking engineering graduates who display a set of attributes that are general enough to apply in a variety of contexts and that meet not only enterprise needs, but societal needs as well (Boeing, 1996). Industry's contribution to and support for adherence to the ABET criteria are evidenced in the call for a balance in engineering programs between the acquisition of fundamental engineering knowledge and other key skills that are valuable to professional practice (McMasters, 2004). Despite the established ABET criteria supporting educational reform in engineering, McMasters (2006) stated that the opportunities for reform remain unexploited, even with available information and evidence supporting new ways of learning and teaching:

> …the *fundamental* purpose and overarching goal of our college and university system is to prepare our graduates to become informed, contributing members of our society … In educating engineers for our future, we need to think in terms of a truly student-centered approach with *quality* rather than mere quantity being an objective at the undergraduate level (p. 14).

These recommendations and criteria were not established to dictate how engineering schools were to redesign their programs. Instead, the goal was to develop engineering education programs that supported the early and consistent development of a full spectrum of technical and process knowledge, skills, and attitudes among our engineering graduates. Ultimately, to meet the uncertainty of future engineering challenges, students need to be prepared and skilled in learning how to learn (Kolmos, 2006). Arlett et al. (2010) noted, despite common drivers for change to meet industry needs, "… each university is different and needs to take a different approach to achieving change, whether it is radical or incremental in nature" (p. 7).

Problem-Based Learning: An Active Learning Approach

With the development of new criteria for engineering programs, educators have begun to redesign programs to move away from a content input focused (i.e., what goes into the program to be taught) to a learning outcome-focused design (i.e., what knowledge, skills, and attitudes graduates will possess) (Heitmann & Vinther, 2009). According to Felder and Brent (2003), PBL is a pedagogy that can meet the needs of engineering education as the academy transitions from traditional, content, and teacher-focused approaches to active, learner-centered approaches. However, this change in perspective and intent necessitates a change in focus from teaching to learning (Kolmos, 1996). Therefore, active learning strategies focused on the learner rather than the teacher are required.

Several pedagogies fall under the umbrella of learner-centeredness, including PBL. The basis of PBL is to intentionally design a supported learning environment that fosters critical thinking, problem solving, self-directed learning, communication, collaboration, management, and interpersonal skills, in addition to the acquisition of technical and content knowledge and skills (Hmelo-Silver, 2004). Using a PBL approach, learners are placed in authentic situations where knowledge and skill acquisition are self-identified and directly related to the problem being addressed, thus bridging the gap between theory and practice, and enhancing the opportunity for transfer of skills to real-world settings (Barrows, 2002).

Savin-Baden (2008) stated that the ability of countries, such as the United Kingdom, to remain competitive could be compromised if engineering schools continued to produce graduates who could not apply foundational engineering knowledge to practical situations encountered in professional practice. The concern for remaining globally competitive is also valid in the United States (Sheppard et al., 2009), yet the adoption of PBL in American engineering schools seems to be occurring at a much slower pace than in the rest of the world. Only two universities, University of Delaware and Samford University, have implemented PBL as a full curricular strategy (Hsieh & Knight, 2008). In comparison to engineering schools in Australia, the United Kingdom, and Europe, Hassan et al. (2004) reported that despite evidence of some use of PBL in engineering programs in [the] United States, the practice "is still far from widespread" (p. 3).

The Role of the Instructor in PBL Adoption and Implementation

There is no single approach to implementing problem-based learning (Barrows, 1996; de Graaff & Kolmos, 2003; Hmelo-Silver, 2004; Maudsley, 1999) in the curriculum. In fact, Savin-Baden (2008) outlined seven different PBL models that could be implemented within the context of traditional learning settings. The diversity of PBL models reflects the differing values, beliefs, and objectives found in different academic settings, situated within different cultures, and located in different geographies. As described by Kolmos, de Graaff, and Du (2009):

> As more and more institutions go in the direction of more student-centered learning, the cultural dimension becomes important. A specific model developed in Canada or the Netherlands, in a specific subject area such as medicine, cannot easily be transferred to engineering in Asia or South America. In engineering, the practical conditions are quite different from those in the health sciences and the cultural values in Asia and South America result in different communication patterns and decisions strategies on teams. As a consequence, it is not possible for Asian or South American universities to copy a western curriculum and learning approach. If it is to be successful, the organization of learning has to be developed from the cultural practices that are known to the student and staff (p. 10).

According to Rogers (2003) one of the factors that impacts adoption is compatibility of the innovation (e.g., PBL) with cultural values. Wejnert (2002) concurred that a "fundamental element in adoption theory is recognition that innovations are not independent of their environmental context but that they rather evolve in a specific ecological and cultural context" (p. 310). This statement is also reflective of the challenge of PBL implementation with regard to the role of the instructor, where the traditional cultural value in engineering education has been on the subject-matter expertise transmitted from the teacher to the student (Mitchell & Smith, 2008).

Woods (2006) acknowledged that the introduction of PBL into the classroom required significant adjustments to teaching and learning perspectives, practices, and roles for both educators and students. In a PBL implementation, educators need to adopt roles that are more facilitative than directive. According to Dolmans et al. (2002), the instructional emphasis is on fostering the skills of learning to learn.

Furthermore, the instructor/tutor must remain process – rather than subject-focused and facilitate problem definition, brainstorming, elaboration, and reflection in small group activities (Moust, van Berkel, & Schmidt, 2005). Kolmos (2006) stated, "the most important innovative aspect of the PBL educational concept is the shift from teaching to learning, and consequently the task of the teacher is altered from the transferring of knowledge into facilitating to learn" (p. 40).

Implementation Tensions

With the implementation of anything new, the implementer will inevitably find themselves in a position of disequilibrium and renegotiation between the old and the new state of affairs. These disruptions in routine and expectation result in tensions. As defined by the Oxford Dictionary Online (2012), tension comprises "…a relationship between ideas or qualities with conflicting demands or implications."

Tensions Related to the Context of Higher Education

Despite faculty having a significant amount of autonomy within their classrooms and control over their teaching/research practices, it is important to remember that their classes/courses are embedded within a larger system. According to Núñez (2009), the structure and activities of the classroom consist of components such as participants, goals, tools to achieve goals, rules of engagement, community/culture, and roles and responsibilities. Typically, the classroom is nested within a larger system of the academic schools of the institution (e.g., school of engineering). These larger systems also consist of a set of goals, tools, rules of engagement, community/culture, and divisions of labor that may support or conflict with the efforts of educators at the classroom level.

Barriers that impact adoption of innovations can be structural (Yidana, 2007) or cultural (Asmar, 2002). Structural barriers are related to the status and priorities of faculty, while cultural barriers are related to the basic values of teaching and research within the institution (Schneckenberg, 2009). Tensions exist between the desired outcomes of education and the affordances that actually exist within the institutional system.

Structural barriers. Issues such as time, workload, and tenure were identified by Yidana (2007) as barriers to adoption of innovative teaching practices. Time was viewed as a commodity in higher education settings and considered to be in short supply, yet was reported as one of the critical ingredients in the adoption of innovative practices. Time is needed to become familiar with the innovation and to figure out how to integrate it into the curriculum (Yidana, 2007). Time also is required to participate in professional development and obtain training in new pedagogical practices (Jasinski, 2007). Yet, changes in workload and release time to support the development of university teachers are not evident in the literature (Hora & Millar, 2008). Additionally, Tang and Chamberlain (2003) found that while professorial rank did not have a significant effect on faculty attitudes toward teaching and research, tenure did. In comparison to tenured faculty, untenured faculty reported a greater belief that tangible rewards influenced their teaching.

Cultural barriers. The emphasis on research over teaching is a primary example of a tension encountered in higher education. Funding, incentives, and promotion are the rewards for a heavily research-centered academic agenda. Vying for open positions is highly competitive among young academics, and Schneckenberg (2009) noted that one of the main criteria for gaining employment was a solid research portfolio. While good teaching practices were valued, they were not given equal weight at the time of promotion (Inderbitzin & Storrs, 2008; Tang & Chamberlain, 2003). Asmar (2002) stated, "in universities with academic cultures that have traditionally lauded and rewarded disciplinary research, attempts to enhance the status and effectiveness of teaching and learning practices must take account of the ongoing power of the research culture" (p. 18). He, too, advocated a change to promotion criteria that included a consideration of effective teaching. Inderbitzin and Storrs (2008) concluded that the system, culture, values, and rewards of higher education institutions tended to reinforce the traditional approaches to teaching, while the call for educational reform at universities seemed to point in the opposite direction.

Tensions Related to Adopting Pedagogical Innovations

The adoption of an educational innovation, whether technological or pedagogical, involves some degree of disruption to familiar routines and teaching habits. However, the adoption of technological innovations is different than the adoption of a pedagogical innovation such as PBL. Motivation to adopt technological innovations tends to be initiated by administrators. Samarawickrema and Stacey (2007) stated "many participants adopted [technology]-based learning and teaching approaches as a response to top-down authority innovation directives, student demand, economic imperatives (e.g., to increase student numbers), and political imperatives (e.g., threats of closure of schools and departments)" (p. 320). In contrast, motivation to adopt pedagogical innovations, such as PBL, tends to be initiated by individual instructors (Szabo & Sobon, 2003) – a bottom-up rather than a top-down approach.

Technological innovations such as the incorporation of online teaching tools (Samarawickrema & Stacey, 2007; Schneckenberg, 2009) or learning management systems (LMS; Zellweger Moser, 2007) prompt faculty to engage in either first- or in second-order changes (Cuban, 1993; Ertmer, 1999, 2005). A first-order change is described as one where teachers incorporated the technology but its use did not result in a change to the structure of teaching or the culture of the institution. For example, the implementation of an LMS provides the means for instructors to potentially do what they have always done—track grades, distribute readings, post assignments.

Teaching approaches can and do remain unchanged. In contrast, a second-order change is one that necessitates reform in both how teachers think and what they do. Although second-order changes can occur with adoption of "hard," tangible technologies such as hardware and software, Butler and Sellbom (2002) found that faculty questioned whether the use of technology actually enhanced learning. However, the adoption of "soft" technologies, such as new pedagogies, required a paradigm shift (Szabo & Sobon, 2003) and thus tended to occur at the initiation of the individual instructor.

Szabo and Sobon (2003) stated that pedagogical innovation necessitates a change of habit and culture because it forces a transformation in thinking on the part of teachers and learners. For example, as noted earlier, views of teaching in engineering education tend to focus on didactic, lecture-driven, information-transmission formats. However, the adoption of learner-centered, teacher-facilitated designs requires a shift in focus to collaborative, project-oriented, knowledge construction processes. Canavan (2008) described the tensions as an apparent conflict between strategic influences (e.g., traditional – less time, less effort) and the recognition of the attributes of PBL (e.g., deeper learning, authentic). Additionally, pedagogical innovations such as PBL necessitate a review of the current system in order to gauge alignment of processes, as tensions result in misalignments. Here again, the values and culture of the larger system may produce tensions when innovation is implemented. Aside from tensions surrounding assessment strategies, additional tensions are evidenced in the need to rethink the classical hierarchical subject matter structure of teaching content before requiring application of that content in practice.

Tensions Related to PBL and Engineering Education Reform

The need to understand the tensions in PBL and engineering education reform as experienced by educators is critical. These tensions may serve as barriers that provide a rationale to move away from or not engage at all with more innovative and effective student-centered pedagogies. Yet, despite these tensions, or challenges, some educators persist. The value seems to lie not in the perspective that tensions need to be eliminated or removed, but in understanding how these tensions can be managed in such a way so as to allow educators to continue to achieve their curricular objectives within their teaching practices. In the next section, we review tensions related to both PBL and engineering education reform.

Tensions in PBL

Through a review of the PBL literature, Hung, Bailey, and Jonassen (2003) identified and described five tensions related to PBL adoption and implementation. These tensions relate to: depth vs. breath of curriculum, higher-order thinking vs. attainment of factual knowledge, long term vs. immediate learning outcomes, students' initial discomfort vs. subsequent positive attitudes, and traditional vs. facilitative role of the instructor. These are described in more detail next.

Depth versus *breadth of curriculum*. "The PBL method limits the possibility of students being exposed to broader content that may be a part of a course or program of study but may not be directly related to the causes or solutions of the problem under investigation" (Hung et al., 2003, p. 13). The use of PBL allows students the opportunity to direct their own learning with reference to the presenting problem, and any content not relevant to informing a solution to the problem is unlikely to be accessed or pursued. In an already bloated engineering curriculum, the potential impact of not covering all the basic science content in the early years of the program is definitely a tension. However, some educators indicated that they were willing to trade off the efficiency of the traditional teaching approach in covering breadth of content for the effectiveness of PBL in supporting an in-depth understanding of content (Montero & Gonzalez, 2009).

Higher-order thinking versus *factual knowledge acquisition*. "PBL emphasis on higher-order thinking among students seems to come at the expense of factual knowledge acquisition" (Hung et al., 2003, p. 15). Although there are mixed results with regard to knowledge acquisition in PBL settings, students are not significantly hampered by virtue of participation in PBL (Berkson, 1993). Biggs (1996) indicated that the traditionally used quantitative measures of knowledge acquisition tended to reinforce surface learning in students and fell rather low on the span of cognitive development and higher-level thinking. However, Yadav, Lundeberg, Subedi, and Bunting (2010), in congruence with the research of Gijbels, Dochy, Van den Bossche, and Segers (2005) and Felder, Felder, and Dietz (1998), found that higher-order thinking skills were more evident when assessment methods were aligned with the learning processes and goals of PBL.

Long-term effects versus *immediate learning outcomes*. "Educating students to be lifelong self-directed learners and real-world problem solvers contrasts with the need to prepare students for standardized tests" (Hung et al., 2003, p. 16). The outcomes of deep learning facilitated by PBL tends to be associated with longer retention of learning (Strobel & van Barneveld, 2009), while an emphasis on short-term, exam-passing objectives have resulted in learning that was quickly forgotten (Montero & Gonzalez, 2009).

Students' *initial discomfort* versus *their positive attitudes*. "Students find the initial transitions into PBL to be difficult. Ultimately, though, they become generally satisfied with PBL…once the transition is made" (Hung et al., 2003, p. 17). After engaging in PBL, students tend to report high levels of satisfaction with the learning experience, but transitioning to the point of comfort is described as challenging (Mitchell & Smith, 2008). As a general observation, students are exposed mostly to teacher-driven and lecture-based pedagogies throughout their educational experience. Students reported that the transition to PBL produced discomfort when the explicitness of what needed to be done "exactly" was not forthcoming (Montero & Gonzalez, 2009). In fact, some students' reactions revealed that they preferred that class time be spent lecturing and providing them with information directly. However, with time, students felt that their process skills improved through engagement in the PBL process (Ahern, 2010).

Traditional role of instructor versus *role of facilitator*. "PBL requires professors to reposition their roles in teaching from a transmitter of knowledge and information to a facilitator of thinking and learning" (Hung et al., 2003, p. 19). The relinquishing of control of not only the content but also of the students' learning processes is a challenge for those used to traditional, lecture-based content delivery. Just as the scope of implementations can vary for PBL, so too can the degree to which the instructor takes on the recommended role of guide.

Tensions in Engineering Education Reform

While Hung et al. (2003) identified tensions related to implementing PBL, other researchers (Crawley et al., 2007; Holt, Radcliffe, & Schoorl, 1985; Mills & Treagust, 2003; Olds & Miller, 2004; Wright, 2005) identified tensions specifically related to engineering education reform. These are discussed next.

Individual versus *organizational value assigned to teaching*. Wright (2005) described this tension as the "discrepancies in the value that faculty assign to teaching and the worth they believe their colleagues and organizations attribute to instructional activities" (p. 331). The presence of this tension may have a significant impact on job satisfaction, performance, and commitment to the organization and to teaching. Wright indicated that this tension was more relevant at large research universities where, perhaps, standards of good teaching were less clearly articulated than at smaller institutions. As noted earlier, the emphasis at large universities was much stronger on research activities than on teaching competencies (Crawley et al., 2007).

Theory versus *application/practice*. Mills and Treagust (2003) described this as a tension between teaching fundamental engineering and science content knowledge versus teaching how to apply the knowledge in practice. This tension was reflected in the work of Town and McGill (2008) who presented the perspective of engineering academics who believe that prior knowledge of technical fundamentals was necessary before anything substantial could be taught. An additional challenge here, noted by Crawley et al. (2007), was that most engineering educators had not actually practiced engineering.

Classroom problems versus *real-world problems.* The use of well-structured, one-solution problems versus ill-structured, multiple-solution problems was reflective of the distinction between the types of problems students encountered in school textbooks as opposed to the typical problems engineers encountered in the workplace (Crawley et al., 2007). Textbook activities tend to imply that problem solving is a linear process that emphasizes right answers through a process of formula memorization and procedural application, as opposed to a process that engages students in deep learning through meaning making (Jonassen et al., 2006). Holt et al. (1985) stated that the textbook method was "neat, tidy, and easy to teach and examine. However, no matter how attractive such methods may be to academics, real-world needs do not come neatly packaged as a set of objectives to be achieved" (p. 108).

Single disciplinary versus *interdisciplinary content*. A disciplinary approach to teaching is focused on a single subject versus the integration of content from several relevant competency areas. The integration of content can be a significant driver for the implementation of PBL within the engineering curriculum. The benefit has been shown to not only enhance student retention, but also to positively impact academic performance in subsequent years of the engineering program (Froyd et al., 2006). However, a review of several studies focused on science, technology, engineering, and math majors indicated that undergraduate engineering programs did not typically demonstrate an integration of subject matter in any meaningful way (Olds & Miller, 2004).

Problem solving versus *design*. The different interpretations of what engineers do – solve problems or design solutions – are reflected in this tension. Holt et al. (1985) argued that problem solving and engineering design were not synonymous concepts. They differentiated problem solving as a focus on a "fix it" mentality of tidy problems with a readily found solution as opposed to engineering design that required innovative and creative views of the need for change that did not hold a known answer. de Graaff and Kolmos (2007) concurred that engineers focus on designing solutions, and not necessarily solving problems. Unlike Holt et al. (1985), Jonassen (1997) envisioned design as an advanced form of problem solving and posited that well-structured and ill-structured problems were not dichotomous entities but rather occupied different points on a problem-solving continuum. Mitchell and Smith (2008) found that, even within a PBL setting intended to foster critical thinking and creative problem solving, students still had the tendency to drive toward a single solution and gave little indication that they could justify their designs.

Drivers of Implementation of PBL in Engineering Education

Despite the tensions described above, a number of engineering educators are beginning to adopt and implement PBL approaches in their classrooms (e.g., Denayer, Thaels, Sloten, & Gobin, 2003; Dym, Agogino, Eris, Frey, & Leifer, 2005). Why is that? What are the incentives, or drivers, that enable these educators to persist despite the number of tensions encountered? A review of research articles describing implementations of problem-based learning in engineering education was conducted to determine the reasons for implementation, applying the delimiters of full text access, peer-reviewed, and within the dates of 2000–2010 (to access more recent publications). Forty-eight records were retrieved. Additionally, engineering education journals were searched manually using problem based and project based as search terms. Thirty-eight additional articles were retrieved. Finally, a manual search of conference proceedings (e.g., Transforming Engineering Education – IEEE; American Society for Engineering Education – ASEE; Conference on Engineering Education – CEE) resulted in an additional 22 records. Duplicates were removed and abstracts reviewed for alignment with the additional inclusion criteria of (1) implementation in university undergraduate engineering settings, (2) specific indication of the program year of implementation, and (3) specific indication of the drivers for implementation of PBL. Studies were excluded if they spoke theoretically of a plan to implement PBL, but had yet to put a plan in motion. Also, studies that were written in a language other than English were excluded. Ultimately, 35 studies were selected for analysis. This was, by no means, an exhaustive search for articles, but was intended to provide a preliminary view of the scope of PBL in engineering education.

The implementations of PBL were separated into two segments – those implemented in Years 1 and 2 of the program and those implemented in Years 3 and 4 in order to see if the rationale and drivers related to implementation differed across different years of the curriculum. Although there has been strong advocacy for full curricular implementation (Crawley et al., 2007; Duderstadt, 2008), implementation beyond the course level is yet to be evidenced in the research literature to any large extent (Costa, Honkala, & Lehtovuori, 2007; Dutson, Todd, Magleby, & Sorensen, 1997).

Drivers of PBL Implementations: Years 1 and 2

The early years of an engineering curriculum are intended to orient the students to the field of engineering, and to provide them with a basic science foundation for use and application in the later years of their program. The primary drivers that have led engineering educators to implement PBL in the first and second years of their undergraduate programs included a need to integrate process skills, to demonstrate relevance of the foundational knowledge and basic science to the practice of engineering, to engage and retain students, and to support deep learning and transfer of knowledge and skills. These are explained in more detail next.

Integrate process skills. The primary driver for the implementation of PBL in the early years of an engineering program was the need to foster and develop students' process skills by integrating them into the curriculum (Dym et al., 2005). These skills included self-directed and lifelong learning skills, communication, information literacy, critical thinking, and problem solving. When students had the opportunity to practice and develop these skills, they tended to rate the learning experience highly, especially with regard to interest in the projects (Lilliesköld & Östlund, 2008) and perceived that they developed competencies in these areas (Lima et al., 2007). Students also appreciated the opportunity to work with peers (Jayasuriya, Evans, Hibberd, & Kennard, 2007) and had better learning outcomes for skills like information literacy as compared to traditional classroom instruction (Hsieh & Knight, 2008).

However, teamwork remained a challenge for most students, which they attributed to differences in motivational levels and learning styles of teammates (Jayasuriya et al., 2007; Town & McGill, 2008).

Establish relevance of basic science knowledge to engineering. Another driver for the implementation of PBL in the early years of an engineering program was the need to show relevance of foundational and basic science knowledge to engineering practice. In one sense, this relevance was established by incorporating engineering activities into the first- and second-year programs. The early implementation of PBL offered students the opportunity to engage in design activities and projects that were either of relevance to their daily lives (Denayer et al., 2003) or simulated real-world settings (Dandu, Hassan, & DeLeon, 2007). The use of industry problems allowed students to make the connections between what they were learning and practical applications, and facilitated their application of theory to practice in a relevant manner (Simcock, Shi, & Thorn, 2008). It also helped students begin to understand their potential societal impact and responsibility as engineers (Molyneaux, Setunge, Gravina, & Xie, 2007). Güzeliş (2006) reported that integrating PBL into the existing engineering programs gave first year students a more realistic experience, as real-world problems encountered by engineers were encountered by the students in the form of projects.

In another sense, relevance was also established through engagement with cross-disciplinary content. The development of a first-year program that brought together the subjects of math, physics, and engineering exposed students to the interrelationships among these content areas (Savage, Chen, & Vanasupa, 2007). Froyd et al. (2006) reported that students who participated in interdisciplinary PBL in their first year evidenced a positive impact on academic performance in the second year of the program. Relevance, then, not only facilitated the opportunity to understand the relationship between subject matter and the domain of engineering, but also between PBL activities and the practice of engineering.

Engage and retain students. The use of PBL and active learning pedagogies in the early years of an engineering program was regarded as a way to enhance student retention in the program (Dandu et al., 2007). Froyd et al. (2006) stated that retention was a particular challenge after the first year, since students often could not see the relationships among their basic science courses and the activities of engineers. However, participation in PBL programs, which incorporated active and collaborative learning, seemed to have positive effects. Longitudinal studies reported that students who participated in these programs not only showed a difference in terms of retention and graduation compared to a traditionally taught cohort (Felder et al., 1998), but also "graduated at a significantly higher rate than their peers" (Olds & Miller, 2004, p. 23).

Encourage deep learning and transfer. PBL was also used to support content knowledge acquisition. Froyd et al. (2006) developed a first-year curriculum that integrated three courses in engineering, math, and physics. They compared the performance of PBL and non-PBL participants in a second-year core engineering course to determine the effect of engagement in PBL in the first year. The authors reported that PBL participants' performance was positively impacted, as they earned a higher percentage of "A" grades and performed better in examinations when the first-year content was elaborated on in the second-year course. Costa et al. (2007) also reported higher grade attainment by students who engaged in a PBL learning environment (e.g., a circuit analysis course). Ahern (2010) summarized it well stating, "It is only through active learning, ownership of the learning process and participation that enables students to become deep learners and provides students with the skills to become lifelong learners" (p. 110).

Although these drivers for PBL implementation in the early years of engineering programs are presented individually, they are not mutually exclusive. They overlap and influence each other. Each is an important component in ensuring that engineering students are immediately engaged in relevant activities to develop deep knowledge and skills, both technical and process oriented, that are transferrable to the new challenges they will inevitably encounter in practice.

Drivers of PBL Implementations: Years 3 and 4

The last 2 years of engineering programs typically are designed to provide opportunities for students to apply the foundational engineering and basic science knowledge acquired earlier in the curriculum. Capstone projects were evident in the senior year where students were required to engage in product development and project management (Shekar, 2007), and shift their lab-based procedural knowledge into applied project-based activities (Spezia, 2008). In the later years of the program, the primary drivers for PBL implementation included the need to transfer skills, and opportunities to practice and apply process skills and professional attitudes.

Apply and transfer technical skills. The primary driver for the implementation of PBL in the later years of engineering programs was the need to have students apply knowledge and transfer their skills to novel situations and open-ended problems. This was a legitimate concern, reflected in Edward's (2004) statement that "many graduates still say that they are unable to see the application of theory" (p. 497). The use of real-world, industry-based problems (Brodie et al., 2008; McIntyre, 2002) was preferred by students, and implementers deemed that it was important to bring the aspects of engineering practice into the realm of the students' learning space to help students practice and apply their skills in a realistic manner (Dutson et al., 1997; Nasr & Ramadan, 2008).

Practice process skills. The development and application of process skills was also evident as a driver in later years, but took a secondary position to the application and transfer of skills in senior years of the program. Problem solving and teamwork remained important skills (Mitchell & Smith, 2008; Ribeiro, 2008) and leadership emerged as a desired competency at later stages of the engineering program (Kumar & Hsiao, 2007). Skills such as being self-directed and lifelong learners, as well as being ethical (Mitchell & Smith, 2008; Ribeiro, 2008), were seen as relevant and important for the professional practice of engineering.

Additional drivers in later program years. Although not as prominent in the literature, additional drivers for PBL implementation in the later years of engineering programs included feasibility (Canavan, 2008; Mitchell & Smith, 2008) and learner accountability. For example, Canavan (2008) explored the feasibility of implementing PBL and of developing modules for reuse across universities. He found that process modules could not be used in the electrical engineering program across three universities because of the idiosyncratic context of each institution. Mitchell and Smith (2008) discussed their pilot implementation of PBL in an electronic engineering course. They found that, in this single implementation, the transition was difficult for both teachers and students, who clung to traditional roles and expectations. The concern that students were exam-crammers rather than knowledge builders was evident. Mitchell and Smith (2008) perceived PBL to be a feasible addition to traditional teaching strategies, but neither a replacement of nor, necessarily, a better way to learn.

With regard to learner accountability, another driver for implementing PBL was requiring students to take more responsibility for their learning. This was fostered through encouragement of students to become active learners (Ahern, 2010; Canavan, 2008), to move away from passive note taking, and to develop critical thinking skills (Ahern, 2010).

Implications and Conclusions

This chapter focused on the tensions and drivers of PBL implementations within engineering education programs. The tensions within PBL and engineering education reform, like the drivers for PBL implementation, are not mutually exclusive and, in fact, could be considered overlapping and interdependent. As the two activity systems interact (classroom pedagogical innovations and institutional values), an educator's pedagogical decisions may well be influenced by the larger system, perhaps dependent on how well the educator can manage the tensions encountered. Barab, Barnett, Yamagata-Lynch, Squire, and Keating (2002) indicated that tensions, which they referred to as contradictions, were inherent in activity systems and that they offered opportunity for growth. Similarly, Murphy and Rodriguez-Manzanares (2008) advocated that it was important not to stop at the point of encountering tensions, but to investigate further to see how the contradictions/tensions can lead to innovation.

For administrators and educators who are considering adopting PBL approaches within their programs and/or courses, consideration of the drivers may help address some of the tensions initially experienced. For example, administrators may consider, preferably in a collaborative way, the establishment of instructor support mechanisms that facilitate and encourage the implementation of innovative pedagogies, as well as the redesign of recognition and reward policies. With a view to both of these implications, administrators may also consider creating a greater alignment between pedagogical innovation, course and educator evaluation processes, and the outcomes-based emphasis on student capabilities in order to support engineering education reform and the development of engineering graduates who are prepared for the demands of a global and rapidly changing workplace.

For faculty development specialists, implications for the design of professional development programs that focus on innovative pedagogies like PBL occur at two levels, the classroom and the larger system level. At the classroom level, faculty development programs could include not only an authentic approach to learning about innovative pedagogies, but also the incorporation of management strategies that address the tensions encountered during new implementations. Additionally, because the effective implementation of PBL is more of a process than a point-in-time training event, faculty developers may consider the value of communities (of practice, of interest) to support the tactical and emotional aspects of innovative teaching within a traditional domain like engineering. Additionally, from a systems perspective and in consideration that the engineering educator implementing innovative pedagogies is an agent of change, faculty development specialists could ensure that programs for faculty and administration include models of change management, which are applicable to the specific environment.

For faculty who must manage the ongoing challenge of depth versus breadth of content, curriculum designers may consider an analysis of need-to-know versus legacy content, the latter of which may carry less relevance in today's professional engineering practices. Faculty and/or curriculum designers may also consider how to redistribute content to allow optimal use of instructor time to support deep learning in students as well as an integrative rather than an additive approach to the inclusion of new content.

Finally, the role faculty play in the adoption of pedagogical innovations cannot be overemphasized, as they tend to be the bottom-up instigators of change. For those faculty who persist with consistent implementations of PBL in their teaching practices, it is useful to understand how they manage the encountered tensions, so that personal strategies can be applied systemically at all levels. In this way, greater PBL implementation is likely to occur across the entire engineering program, benefiting our future graduates as well as their future employers.

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Chapter 5
Multimedia Design and Situational Interest: A Look at Juxtaposition and Measurement

Tonia A. Dousay

Introduction

The use of images to enhance learning is a complex undertaking with a myriad of advantages and disadvantages. There are number of limitations and considerations related to static images, animations, or full simulations. Cognitive influences on the capturing of interest through the use of visuals and defining learner interest have been examined by decades of research. Cognitive processing models even go so far as to provide guidelines for consideration when employing media in learning. Nevertheless, little attention has been given to the use of specific multimedia model principles and their affect on learner interest. The problem is that many learners in multimedia learning environments experience a decreased intrinsic motivation to continue or complete lessons due to poor designs that negatively impact interest (Moreno, Mayer, Spires, & Lester, 2001). Thus, there is a need to explain the importance of learner interest and potential impact of multimedia design; essentially the way in which cognitive science research about visual images can be effectively applied to learning designs.

Educators have the ability to stimulate students or hinder their motivation all together. It stands to reason that educators who employ designs based on the study of motivation can enhance learners' desire to learn. Conversely, learning designs that fail to incorporate or consider motivation research findings may prove insufficient for expectations. The increasing prevalence of online learning in today's educational environment provides an excellent scenario in which to examine the impact of learning design on motivation. Online learning environments serve as an example that is dominated by multimedia instruction. Carr (2000) and Wojciechowski and

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Palmer (2005) indicated that online learning environments often present negative challenges for learner motivation and completion rates. Meyer (2003) further noted that a number of online learners struggle because of a lack of motivation or self-confidence. Enhancing students' interest while taking courses in online learning environments seems a probable means of promoting higher learner satisfaction and better completion rates.

Research and practice related to learning design and motivation has a variety of juxtapositions. The placement of images alongside text in manuscripts dates back to the seventh century in the *Book of Kells*, and represents the conceptual phenomenon behind the use of images to capture interest. Theoretically, there are two major approaches to consider when examining image placement and capturing interest. First, cognitive processing theories explain the ways by which we perform the complex series of actions required to receive and store information. The same theories prescribe ways in which images and media should and should not be used in order to maximize this process. Second, motivation theory provides an explanation for how and why we are driven to perform certain behaviors. Within motivation theory, interest explains a preference for certain activities. A practical application begins to emerge through an analysis of these theoretical frameworks wherein cognitive processing theories are informed by interest theory, resulting in prescriptive guidelines for designing media to target interest. The resulting conclusion is to investigate empirical studies examining the impact of media design on learner interest.

Cognitive Processing and Multimedia

Multimedia is defined here as the use of multiple types of media, particularly the presentation of words and pictures together, during a presentation of information. Multimedia learning encompasses building mental representations from words and pictures, and multimedia instruction includes words and pictures intended to promote learning (Mayer, 2005). Baddeley (1986, 1999), Chandler and Sweller (1991), and Paivio (1986, 1991) provided evidence to support the notion that there are separate channels for processing visual and auditory information, and that humans are limited in the amount of information that can be processed by each channel at one time. Wittrock (1989) studied cognitive relationships in reading comprehension and posited that comprehension is a generative process that relies upon signals, strategies, and plans to relate events to one another. Mayer (2001) expounded upon these foundations of cognitive processing to propose that humans actively engage in learning by attending to relevant incoming information, organizing selected information into coherent mental representations, and integrating mental representations with previous knowledge to be stored in long-term memory. Figure 5.1 illustrates a generalized overview of the process that occurs when media are processed by sensory memory, working memory, and long-term memory. Resulting multimedia models and guidelines begin to emerge through cognitive processing theories that can inform multimedia development.

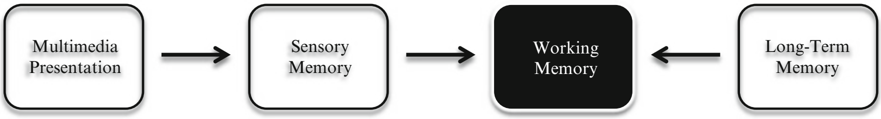

Fig. 5.1 An overview of the process proposed by the *Cognitive Theory of Multimedia Learning* (CTML)

Building upon the CTML learning process, there are design implications to take advantage of learner abilities in the context of learning with multimedia. Schnotz (2005) presented an Integrated Model of Text and Picture Comprehension (ITPC) that, in coordination with Mayer's (2001) CTML, promotes six key principles for consideration in multimedia design. First, designers should combine text with content-related images only when learners have low prior knowledge and possess sufficient cognitive abilities to process both the text and pictures. This combination is known as the *basic multimedia principle*. Second, the *spatial contiguity principle* recommends presenting written text in close spatial proximity to related images. The *temporal contiguity principle* is third and takes the concept of placement further by suggesting the presentation of spoken words in close temporal proximity to related images. Fourth, the *modality principle* proposes the use of spoken words instead of written text for animation. Related to modality, the specific *redundancy principle* clearly states that written text should not duplicate spoken words and represents the fifth principle in multimedia design. Sixth, *the coherence principle* advises against the use of extraneous words and pictures or unnecessary sound or music. The combination of the six principles represent an array of tools to be used by instructional designers and multimedia designers to maximize learners' cognitive capabilities to receive and process information; and serve as a framework for applying and evaluating the *Cognitive Theory of Multimedia Learning*.

Capturing Learner Interest Through Images

More than 20 years ago, newspapers originally addressed the concept of interest in order to better understand how readers perceived charts and graphs published with articles. Tankard (1988) showed that readers did not retain any more information from flashier graphics than from plain images, but findings did support that readers saw these "chartoons" (p. 91) and three-dimensional graphs as more appealing. This groundwork of examining the effectiveness of visuals provided an outlet for further investigation. Austin, Matlack, Dunn, Kesler, and Brown (1995), Delp and Jones (1996), Michielutte, Bahnson, Dignan, and Schroeder (1992), and Morrow and Hier (1998) found that the use of images to enhance the appeal of medical handouts led to a higher probability of the information being read and patients recalling the information provided. Further evidence supports the use of images with text in order to positively impact attention and recall of information. Houts, Doak, Doak, and Loscalzo (2006) examined how pictures improved communication between health practitioners and patients, and found that patients with well-developed language skills found it difficult to process medical information for a variety of reasons, including unfamiliarity with terminology and emotional effects. The use of images and diagrams near medical information mitigated the observed difficulties. However, findings remain unclear about the emphasis on how and where to maximize images' effects on interest.

The reason for using static and animated images in education is based upon research related to attention and interest. Slough and McTigue (2010) noted that textbooks traditionally use images and illustrations sparingly and in a secondary role to conveying content. As learners who are accustomed to multimedia environments become more prevalent, the traditional method will not be able to gain or hold readers' attention for very long. One approach to help students understand content is to make the text more interesting through the use of visuals and graphics. Kim, Yoon, Whang, Tversky, and Morrison (2007) reported an emerging trend, which has been reported by teachers to be preferred among learners, to lay out textbooks in a way that mimics websites through use of photographs, tables, textboxes, flowcharts, and drawings. Looking across the various types of images, current technologies have allowed for an increasing use of animations with respect to learning and instructional text. Kim et al. further noted that researchers and educators initially assumed that animations would facilitate an increased interest in learning, and that while the effects of animated images on learning are still a controversial topic, the use of graphics continues to grow in popularity largely due to a belief that animations are more interesting and aesthetically appealing. Aesthetic appeal is influenced by interest, which is commonly divided into two classifications, emotional interest and cognitive interest (Kintsch, 1980). Therefore, interest effects may vary depending upon individual differences, including age and spatial ability (Kim et al., 2007). Specifically, adolescent learners prefer animations over static images and find them to be motivating. Preferences for images present several implications for designing learning content, but image use should be considered carefully, taking into account the characteristics of the intended audience.

Media Selection

Consideration for designing media must occur simultaneously with selecting media. Anglin, Towers, and Levis (1996) concluded that the effective use of graphics in designing instruction is an important facet of instructional message design. This may be due to the finding that up to 40 % of conceptual learning can be attributed to visual experience (Weber, 1922). Media largely comprise visual messages and have historically included photographs, drawings, diagrams, maps, and film. McKenzie (2005) noted that while the medium may not be the message, it is a significant part of the learning experience. Media, and specifically multimedia, can make a significant contribution to curriculum by representing real objects and ideas about reality that may not otherwise be possible (Cohen, 2010). Additionally, using images in instructional materials is effective in supporting learning, because they can help gain a learner's attention and help learners interpret and remember the context of illustrated texts (Park & Lim, 2007). Traditionally, textbooks have used images and illustrations sparingly and in a secondary role to conveying content. As learners who are accustomed to multimedia environments become more prevalent, this method will not be able to gain or hold readers' attention for very long (Slough & McTigue, 2010). Though advancements in technology have enabled designers to broaden visual messages to include video, animations, and icons, Baker and Dwyer (2000) and Richey, Klein, and Tracey (2010) cautioned that not all elements of visuals are equally important for instruction. An example of the variance among visual elements includes the use of color to arouse interest, but using realistic details may distract learners from the primary task. Perhaps most significantly, Cohen (2010) stressed that multimedia selection and design must consider issues of cognitive load. By considering the instructional attributes of multimedia, a foundation can be created to assess when and how to specify elements in courses.

Designs that Motivate

The problem is that many learners in multimedia learning environments experience a decreased intrinsic motivation to continue or complete lessons due to poor designs that negatively impact interest. Given that positive perceptions may assist in maintaining students' interest in content, it may be worthwhile to analyze and address learners' perceptions of multimedia (Moreno et al., 2001). Therefore, there is a need to address the problem of decreased intrinsic motivation in multimedia learning environments and propose updated design guidelines.

Design principles provided through the CTML are intended to maximize student's understanding of learning materials. However, Keller (1983, 2010) and Linnenbrink-Garcia et al. (2010) suggest that motivation and interest have been neglected as an influence on understanding and achievement. Further, it is important to address making the learning experience as positive as possible, ensuring that materials are useful and engaging enough to make the learning process desirable (Yu, Jannasch-Pennell, & DiGangi, 2008; Yu, Jannasch-Pennell, DiGangi, & Kaprolet, 2009). Learners exposed to multimedia in instruction report an enhanced motivation to learn the subject matter, regardless of the topic or level of difficulty (Yu et al., 2009). Similarly, multimedia presentations that incorporate text, graphics, and animations have been shown to result in increased learner interest (Koeber, 2005; Nowaczyk, Santos, & Patton, 1998; Wekesa, Kiboss, & Ndirangu, 2006; Yaverbaum, Kulkarni, & Wood, 1997). Instructional designers influenced by an increased demand to increase learning opportunities while simultaneously reducing costs without adversely affecting instructional quality face the challenge of finding the right combination of constructive media (Holden & Westfall, 2010). Hence, research to support design considerations that enhance interest may have an impact on both practice and future research.

Motivation Theories and Learner Interest

Motivation is derived from a personal desire for specific outcomes or goals. Ryan and Deci (2000a, 2000b) define motivation as the "means *to be moved* to do something" (p. 54). Lacking an impetus or inspiration to act, a person is unmotivated. Conversely, someone who is excited or aroused towards something is considered motivated. Deci and Ryan's (2000) *Self-Determination Theory* (SDT) promoted the psychological need for competence, autonomy, and relatedness in human motivation. Deci and Ryan (1980, 1985, 1991, 2000) further proposed that types of motivation are differentiated based upon the reasons or goals that underlie the action. *Intrinsic motivation* refers to action based upon an inherent interest or enjoyment and comes from personal interest, curiosity, or values. *Extrinsic motivation* refers to doing something based upon a separable outcome, such as a reward system, grade, evaluation, or the opinions of others. More than 30 years of research has reinforced the notion that the "quality of experience and performance can be very different when one is behaving for *intrinsic* versus *extrinsic* reasons" (Ryan & Deci 2000a, 2000b, p. 55). Relatedly, Ryan and Stiller (1991) found that *intrinsic motivation* is an important phenomenon in education. Nevertheless, many learning tasks are designed with *extrinsic motivation* in mind, which can result in resentment, resistance, and disinterest if the motivation is externally propelled (Ryan & Deci, 2000a). When learners self-endorse tasks that are attached to an extrinsic motivator, the impetus to act is derived from internal volition, but the motivator itself is still external to the learner and thus extrinsic by definition. Understanding the differences between intrinsic and extrinsic motivation are important to researchers and practitioners, because the differences help identify ways in which to foster each type of motivation in learners.

Defining Learner Interest

Learner interest as a concept extends beyond the basic feeling or emotion that drives a person to action. Interest is not specifically a type of motivation, but plays a significant role in influencing motivation (Schunk, Pintrich, & Meece, 2008). Further, students interested in a topic may display motivated behaviors, such as choice of the activity, effort, persistence, and achievement. Exploring the effect of motivation on metacognition has indicated that when students attempt to complete a course, they are either interested in the content, motivated to attain a goal of importance, or both (Tobias, 2006). Incorporating motivational variables, such as interest, into multimedia design will become an important task if instruction is to provide learners with relevant learning experiences (Fletcher & Tobias, 2005). Harp and Mayer's (1997) study aimed at making scientific textbook lessons more interesting found that promoting cognitive interest could be done by adding signals for structural understanding such as summary illustrations with captions. Research is only beginning to fully explore what interest encompasses and to how help designers can incorporate interest into the design process.

Motivation and Learner Interest

Learner motivation as a consideration within learning design has a mixed history with regard to research and application. Originally, Keller's (1987) motivational design model supported the assertion that increased motivation and time on task increases learning outcomes. However, Brooks & Shell (2006) noted that very few references have been made to motivational design in instructional design literature. Keller's ARCS model, which is largely extrinsic in design, has historically been the only mention of motivation in design (Morrison, Ross, Kemp, & Kalman, 2011). Perhaps in response to this lack of focus, Keller (2010b) revisited motivational design to produce a generalized, systematic overview of learner motivation in instructional design. The result of Keller's work is a book for designers providing an overview of motivational theory, a systematic motivational design process, and tools to support motivational design activities. Keller provides specific detail on the topic of interest as a subset of motivation in terms of establishing a psychological basis for relevance of motivation in learning design. The attention is likely due to the established positive link between individual student interest and academic achievement. Schroff and Vogel (2010) asserted that interest is one of the critical positive emotions in learning contexts. Similarly, Schraw, Flowerday, and Lehman (2001) noted that interest increases learning and believed that promoting interest increases students' intrinsic motivation to learn. These findings also relate to the correlation between positive emotions, such as interest, and cognitive processes, including cognitive processing, decision-making, and creative problem-solving (Isen, Daubman, & Nowicki, 1987; Isen, Johnson, Mertz, & Robinson, 1985; Picard, 1997). Taking into consideration earlier challenges identified with technology-enhanced learning, it appears that specifically designing media to enhance learner interest could lead to better achievement. However, first it is important to better understand the theoretical foundations of interest and how it relates to motivation.

Learning as a result of motivation has been attributed to interest. Schunk (2008) has noted that interest plays a significant role in influencing motivation. Further, Fairchild, Horst, Finney, and Barron (2005) found that interest in an activity is actually the result of intrinsic motivation. Students interested in a topic may display motivated behaviors, such as choice of the activity, effort, persistence, and achievement. Hidi and Renninger (2006) suggested that as a motivational variable, interest triggers the engagement of learners with particular classes of objects, events, and ideas over time. Thus, the effect of interest on motivation is amplified since interest is grounded in both the affective and cognitive abilities of learners. Although Deci and Ryan (2000) proposed that *intrinsic motivation* is based upon inherent enjoyment, coming from within the learner, Hidi and Renninger (2006) found that content and environment can affect the development of interest. The information contained within a learning task, how the task is designed, and where the task is delivered all have the potential to stimulate or discourage the learner's interest.

Types of Interest

Interest, as a theory, is categorized into one of the two subgroups; individual interest and situational interest. Individual interest (II) resides within a person, associates positive feelings with a topic or activity, and attributes personal significance to the topic or activity (Rathunde, 1993; Renninger, 2000; Renninger, Hidi, & Krapp, 1992; Schiefele, 1991). Individual interest is also referred to as personal interest, because as Dewey (1913, 1933, 1938) noted, interest is an active state based on real objects with a highly personal meaning. Situational interest (SI) emerges as a response to features or effects within an environment (Hidi & Anderson, 1992; Hidi & Baird, 1986; Hidi & Renninger, 2006; Krapp, 2002). Examining situational interest further, there are attentional and affective reactions that can be differentiated into *triggered-SI* and *maintained-SI* (Hidi & Baird, 1986; Hidi & Harackiewicz, 2000; Hidi & Renninger, 2006; Krapp, 2002; Mitchell, 1993). Tr*iggered-SI* is the initiation or arousal of interest (Hidi, 2001; Hidi & Harackiewicz, 2000; Hidi & Renninger, 2006). *Maintained-SI* is where interest is held and individuals begin to connect with the content (Hidi, 2001; Mitchell, 1993). The revelation is that the way learning content is displayed has an impact on the triggering of *situational interest* and how well learners maintain their *situational interest* throughout the duration of the learning activity.

Learning design strategies that take into account individual and situational interest during the design of instruction have the potential to help students become engaged and focused on the content. The effects of *triggered-SI* can be temporary if *maintained-SI* is not adequately considered. The results of a validity study on the Situational Interest Survey (SIS) by Linnenbrink-Garcia et al. (2010) found that *triggered-SI* reflects a positive affective reaction to the manner in which material is presented and *maintained-SI* refers to the reaction learners have to the material. Based upon the positive affective reaction to material presentation, it will be important to continue to examine situational interest across educational settings to further investigate what instructional practices can be designed to promote situational interest.

Using Learner Interest

Both types of interest have the potential for a positive impact on learners. Hidi and Baird (1988) found that *situational interest*, while intrinsic in nature, is encouraged by extrinsic factors. Attempting to design materials aimed at affecting individual interest is challenging and impractical. However, improving *situational interest* in learning environments should be a fundamental concern (Park & Lim, 2007). One method of designing for *situational interest* is through vividness of text (Schraw et al., 2001), where vividness is defined as "segments that stand out because they create suspense, surprise, or are otherwise distinctive" (p. 217). The effect of vividness was found by Schraw, Bruning, and Svoboda (1995) to be related positively to interest and recall. Hidi and Baird (1988) also noticed an increase in reading comprehension when studying *situational interest* and cognitive performance. There are specific benefits of *situational interest* related to learning. First, *triggered-SI*, which is typically supported externally, precedes the development of a predisposition to repeated engagement with content. Second, *maintained-SI* includes focused attention and persistence over time and can be preserved through meaningfulness or personal involvement (Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000). Therefore, learning strategies that take *situational interest* into consideration when designing instruction have the potential to help students be engaged and focused. As learners begin to gravitate towards activities that interest them, learning interest will become harder for researchers and practitioners to consider and apply if it is not thoroughly investigated.

How to Measure Interest

Having a firm grasp on the theoretical frameworks of multimedia design and situational interest are only the beginning. Once it is clear what to design and how to design it, there still remains a task of measuring *SI*. Linnenbrink-Garcia et al., (2010) created a scale known as the SIS. The original contexts for SIS development and testing were traditional classroom environments. The first pilot study was conducted in a post-secondary introductory psychology class. The second and third pilot studies considered middle and high school classrooms as a means of broadening the applicability of the scale. After carefully considering the validity of the tool, Linnenbrink-Garcia et al. (2010) specifically noted that it would "be important to continue to test the utility of these measures in other domains and age groups" (p. 667). What then would the survey look like if applied to multimedia environments? Table 5.1 details the original SIS items and resulting modified instrument statements as they might look in the context of multimedia. The proposed new statements were submitted to the original instrument authors for evaluation in order to address initial validity concerns related to Standard 1.4 from the Standards for Educational and Psychological Testing, which holds the researcher responsible for using a scale in a way that has not been previously validated (AERA, APA, & NCME, 1999). Documented correspondence with the experts is available for review.

Future Applications

Initial attempts to use and validate the proposed *Situational Interest Survey for Multimedia* (SISM) are currently underway. The new scale has already been used in a continuing education environment for adult learners who must complete

Table 5.1 SIS Items

Interest type	Original	New
SI-triggered	1. My math teacher is exciting	1. The multimedia presentation was interesting
SI-triggered	2. When we do math, my teacher does things that grab my attention	2. The multimedia presentation grabbed my attention
SI-triggered	3. This year, my math class is often entertaining	3. The multimedia presentation was often entertaining
SI-triggered	4. My math class is so exciting it's easy to pay attention	4. The multimedia presentation was so exciting, it was easy to pay attention
SI-maintained	5. What we are learning in math class this year is fascinating to me	5. What I learned in the multimedia presentation is fascinating to me
SI-maintained	6. I am excited about what we are learning in math class this year	6. I am excited about what I learned in the multimedia presentation
SI-maintained	7. I like what we are learning in math this year	7. I like what I learned in the multimedia presentation
SI-maintained	8. I find the math we do in class this year interesting	8. I found the information in the multimedia presentation interesting
SI-maintained	9. What we are studying in math class is useful for me to know	9. What I studied in the multimedia presentation is useful for me to know
SI-maintained	10. The things we are studying in math this year are important to me	10. The things I studied in the multimedia presentation are important to me
SI-maintained	11. What we are learning in math this year can be applied to real life	11. What I learned in the multimedia presentation can be applied to my job
SI-maintained	12. We are learning valuable things in math class this year	12. I learned valuable things in the multimedia presentation

regulatory training for employment purposes. This use not only extends the original SIS beyond the original learners in middle, secondary, and post-secondary classrooms, but it also transforms the scale for an entirely new frame of reference. A reciprocal relationship exists between research and practice. Technology can enhance instruction which then provides novel opportunities for research to examine the practice and prescribe both future application and continuing research (Salomon & Almog, 1998). As studies in educational psychology continue to adapt to the ever-growing field of instructional technology, it is important that new studies provide practical application of research findings. Use of the SISM has the potential to address the earlier described problem of stimulating learner interest in multimedia environments as well as contribute to the relationship between research and practice.

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Chapter 6
The Effects of Visual and Textual Annotations on Spanish Listening Comprehension, Incidental Vocabulary Acquisition, and Cognitive Load

Michael E. Cottam and Wilhelmina C. Savenye

Introduction

Online learning is becoming more and more pervasive in higher education institutions. According to the Sloan-C report (All & Seaman, 2006) more than 3.5 million students are enrolled in online courses in the United States. That number represents a 9.7 % increase over the previous year, which far exceeds the 1.5 % growth rate for higher education enrollments as a whole over the same time period. The Sloan-C report also indicates that 69 % of institutions in the United States expect student demand for online education to grow and 83 % plan to increase their online course offerings (All & Seaman, 2006).

Concurrent with the overall increase in online education, over the last decade foreign language course offerings have increased dramatically in distance learning catalogues across the country (White, 2003). Also according to White (2003) language courses vary in the technology they use and the teaching and learning activities they employ. Some rely heavily on the latest technology, while others use a mix of well-established and emerging technologies. Some are offered in an asynchronous format, while others have at least some synchronous virtual meetings. However, irrespective of delivery format or technology used, the learning goals are the same.

The goals of modern foreign language instruction include development of multiple language competencies. The American Council on the Teaching of Foreign Languages (ACTFL) establishes national standards for language learning. In their standards document, the council states, "Communication is at the heart of second

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language study, whether the communication takes place face-to-face, in writing, or across centuries through the reading of literature" (American Council on the Teaching of Foreign Languages, 2001, p. 3). Communication takes several forms and requires skills in reading, writing, listening, and speaking, which are reflected in the ACTFL proficiency guidelines.

Although all of the language skills are equally important, in this study we focused on the receptive communication skill of Spanish listening comprehension among beginning-level students whose native language was English. More specifically, we examined one type of multimedia learning activity intended to improve students' Spanish listening skills.

Acquiring language skills requires extensive second language input at an appropriate level (Gass & Selinker, 1994; Krashen, 1985; Lafford & Salaberry, 2003). Krashen states that "We acquire by understanding language that contains structure a bit beyond our current level of competence ($i+1$). This is done with the help of context or extralinguistic information" (1982, p. 21). Participants in the current study, due to their progress in college Spanish courses, were near the novice-high level in the ACTFL proficiency scale. The proficiency guidelines at this level state, "At times, but not on a consistent basis, the Novice-High level reader may be able to derive meaning from material at a slightly higher level where context and/or extralinguistic background knowledge are supportive" (American Council on the Teaching of Foreign Languages, 2001).

In the classroom, listening comprehension instruction commonly includes listening to the teacher, other students, and recorded language samples, while at the same time observing extralinguistic cues such as body language, tone of voice, facial expressions, and prepared visual aids. In a fully asynchronous online course, the main form of aural input is audio or video recordings from the instructor and from other publisher-prepared materials. Such materials sometimes lack the extralinguistic information that makes the aural input comprehensible to students. Adding multimedia components, such as videos or pictures, to accompany the words, may help to improve the comprehensibility of the language input students receive. Two key theories help to explain why this may be so: cognitive load theory and the theory of multimedia learning.

Cognitive Load Theory

Cognitive load theory is concerned with working memory limitations and strategies to overcome those limitations (Sweller, 1999, 2005). This theory is based upon some basic assumptions about human cognitive architecture, long-term memory, and working memory.

Long-term memory capacity is very large and plays a central role in learning (Sweller, 2005). Long-term memories are organized into schemas, which are described as "cognitive constructs that allow multiple elements of information to be categorized as a single element" (Sweller, 2005, p. 21). Learning involves schema acquisition and subsequent practice can allow schema to be processed automatically rather than consciously (Sweller, 2003, 2005).

In contrast to long-term memory, working memory is very limited in capacity (about seven items can be held in working memory at a time) and duration (items remain for only a few seconds) (Miller, 1956; Sweller, 2005). Baddeley (1986, 1992, 1999) describes working memory as being made up of an executive function and two subsystems: a visuo/spatial system and an auditory loop. This division of labor within memory has led other researchers, such as Penny (1989), to find that using both subsystems can increase the capacity of working memory, taking advantage of the modality effect and the split-attention effect later identified by Sweller (2003).

Cognitive load theory describes three different types of load on our memory systems: intrinsic cognitive load, extrinsic cognitive load, and germane cognitive load (Sweller, 1999, 2005). Intrinsic cognitive load is created by the natural complexity of the material to be learned, while extrinsic cognitive load is characterized as that load caused by inefficient instructional design that requires energy to be spent in things other than schema acquisition (Sweller, 2005). Germane cognitive load is that load created by the effort used to create and to make schema automatic (Sweller, 2005). The goal of instruction, therefore, should be to reduce extraneous cognitive load and increase germane cognitive load.

In spite of years of study, research into cognitive load has been limited principally to the areas of math, science, and technology education "for reasons of convenience" (Sweller, 1999, p. 2). However, Sweller (1999) has asserted that cognitive load theory could be generalized to nontechnical, language-based subjects as well. Indeed, within the literature in multimedia learning theory several researchers apply cognitive load theory to their findings.

Multimedia Learning

Mayer, in his generative theory of multimedia learning, contends that students learn more deeply when information is presented in both verbal (written or spoken) and pictorial (illustrations, photos, animations, or videos) forms (Mayer, 2001). In his description of the multimedia principle he states, "When words and pictures are both presented, students have an opportunity to construct verbal and pictorial mental models and to build connections between them. When words alone are presented, students have an opportunity to build a verbal mental model but are less likely to build a pictorial mental model and make connections between the verbal and pictorial mental models" (Mayer, 2001, p. 63).

Mayer examined the presentation and learning of mechanical systems, such as how a pump works and how lightning is formed (Leahy, Chandler, & Sweller, 2003; Mayer, 2001; Moreno & Mayer, 2000, 2002). Subsequently, other researchers extended the application of multimedia learning theory to other contexts, including foreign language instruction, which is discussed later in this article.

Multimedia Theory and Second Language Acquisition

Reading comprehension was among the first second language skills to be investigated in light of multimedia learning theory (Chun & Plass, 1996a, 1996b). Several researchers have investigated the effects of vocabulary annotations on the skill of second language reading comprehension (Ariew & Ercetin, 2004; Chun & Plass, 1996a, 1996b). Vocabulary annotations, as defined by these researchers, are inline hypermedia glossaries that may include textual definitions and pictorial illustrations. Typical instructional reading tasks may not generally follow Mayer's multimedia principle and may not include such illustrations or images to depict what the text describes. Researchers have investigated the effects of such annotations on vocabulary acquisition and reading comprehension.

Chun and Plass (1996a, 1996b) and Plass, Chun, Mayer, and Leutner (1998) found that annotations with both textual and visual information aided students' second language reading comprehension and incidental vocabulary learning more than did textual information alone. Dubois and Vial (2000) also noted that students are able to memorize words better when both textual and visual information is provided. In three separate studies, Yeh and Wang (2003), Yoshii (2006), and Yoshii and Flaitz (2002) also found that students in a text-plus-picture annotation treatment outperformed those in text-only and picture-only treatments on vocabulary recall assessments. In contrast, although Ariew and Ercetin (2004) found that students had positive attitudes towards visual annotations, in these studies there was a negative effect of such annotations on reading comprehension.

The preceding studies all included annotation in the learners' first language and seem to have established that annotations are helpful to students during reading tasks. Yoshii (2006) expanded the research examining different types of annotations. He investigated the effects of annotations supplied in the learners' first language compared to annotations in the students' second language. He found a significant effect for his text+picture treatment over text-only treatment, but also found that text annotations in either language were effective for incidental vocabulary learning.

Other researchers have focused not on reading comprehension, but on students' listening comprehension skills and vocabulary learning. In his multimedia research on listening activities indicated that students performed better on comprehension and vocabulary assessments if they were presented with a multimedia listening activity rather than audio or video alone. Jones and Plass (2002) and indicated that the effects seen in reading comprehension and incidental vocabulary acquisition studies are also present on listening comprehension tasks. Participants who accessed both verbal and visual annotations performed better on vocabulary recall as well as on listening comprehension. In a study on the effects of illustrations on TOEFL test takers' listening comprehension, Ginther (2002) found a positive effect for the presence of images as well.

Research Design

The design of the current study was similar to Jones and Plass (2002) work to investigate the effects of visual and textual annotations in a multimedia listening activity on student vocabulary acquisition and aural comprehension. The present study also included a measure of cognitive load, which had been discussed, but not previously measured in studies of second language acquisition or other language-based material (Jones, 2004; Jones & Plass, 2002; Sweller, 1999).

Furthermore, whereas most research on multimedia theory and cognitive load theory has been conducted in laboratory settings with content such as math, statistics, and well-defined mechanical (Sweller, 1999) systems, in this study we examined the theory in an actual online course environment with students enrolled in elementary-level Spanish courses at an online community college and a large university in the southwestern United States.

The independent variables in the study were visual and textual annotations. Visual annotation consisted of two levels: visuals included or excluded. The visual annotations, when included, were pictorial representations of the vocabulary term. For instance, the key word *cuerno* (horn) was illustrated with a photograph of a bull's horn. Textual annotation also consisted of two levels: included or excluded. Textual annotations, when included, were English translations of the key words. For the word *cuerno* participants saw the word "horn" beside the keyword in Spanish. Participants in the combination treatment saw both the picture and the translation.

The dependent variables in the study were incidental vocabulary learning, listening comprehension, and cognitive load. We also examined student attitudes and time-in-program. The research questions were:

1. What are the effects of textual and visual annotations on aural language comprehension and vocabulary acquisition?
2. What are the effects of textual and visual annotations on cognitive load?
3. What are the effects of textual and visual annotations on student attitudes?

Methods

Participants were recruited from students enrolled in first-year college-level Spanish classes. Initially, participation was offered exclusively to online students at an online community college. Perhaps due to the fact that the study was not a required part of the course, very few students responded to the invitation. Therefore the invitation was also extended to students at a university in the area in hopes of obtaining a larger sample. All students who elected to participate, no matter in which college they were enrolled, did so in an online environment outside of the normal structure of the class. In total, 35 students participated in the study.

The activity, posttest, and survey were completely voluntary and anonymous. No points or extra credit were offered for participation. However, at the end of the activity, participants were given the opportunity to enter a drawing for one of four $100 prizes.

Students who chose to participate in the study accessed a hyperlink which allowed them to be randomly assigned to one of four versions of the online Spanish listening activity. Random assignment was accomplished by a computerized random number generator, such that each student was randomly assigned to one of the four versions of the activity.

Materials

The content of the listening activity was an original, researcher-written description of the Festival of San Fermín and the Running of the Bulls in Pamplona, Spain. The lead researcher is a Spanish faculty member and instructional designer. He collaborated with another Spanish faculty member at the online community college to select the topic and create a basic outline before developing the materials. The topic was chosen for its general appeal to language learners and those interested in foreign travel. The topic also prompts the use of new, unfamiliar vocabulary, vivid descriptions, and memorable images. Furthermore, cultural festivals are a common topic for beginning and intermediate foreign language courses.

A total of 35 key words in the listening passage were identified to receive annotation support in the activity. Words were selected based on the lead researcher's experience with beginning-level Spanish students and knowledge of the course content. Key words were those deemed to be more unfamiliar to students at this level of instruction and thus were more likely to require instructional support within the activity. A subset of the most unfamiliar 25 key terms was used to assess incidental vocabulary learning in the posttest.

The activity began with an introductory screen (Fig. 6.1) containing instructions on how to navigate the software. The help option, accessible by a button at the top right of the screen, was available throughout the program. Following the instructions were two screens of information about the Running of the Bulls in English. This design is similar to the design of the program used in the Jones and Plass (2002) study, which also included introductory screens in English before presenting the listening passage. The pages served as an advance organizer and were intended to activate students' existing knowledge of the topic since they may have seen or heard of this festival previously. Each screen of introductory text was accompanied by a photograph of the festival.

Following the introduction, students were presented with five screens of Spanish listening content. The current screen number and the total number of screens in the program appeared at the bottom of the screen so that participants would always know where they were within the program. Participants could navigate forwards and backwards through the activity or access individual pages freely, with no time

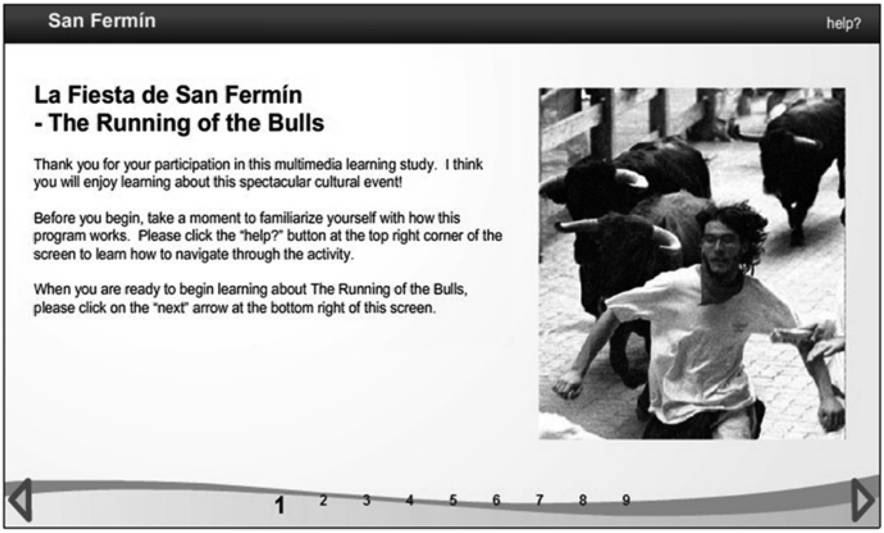

Fig. 6.1 Introduction screen

or sequence restrictions. Although participants had complete control over their movement throughout the program, each new page entry was recorded and time-stamped by the program and a log was sent to the researcher for later analysis.

Upon advancing to a new listening screen, an image representing the topic of the segment appeared on screen and the audio narrative automatically began to play. Each screen contained audio player controls which allowed the student to play, pause, stop, and replay the narration.

Along with the audio controls, the left side of the screen included the seven key words that would be heard within the segment. On mouse-over, the selected key word would highlight, indicating that it was an active hyperlink to more information. Upon clicking a key word, an audio icon appeared which informed students that they could hear the word pronounced individually. Simultaneously, annotations of the selected key word appeared on the right side of the screen.

There were four versions of the activity, which varied in the types of vocabulary annotations that appeared for key words of the spoken text. The variations were: (1) no annotations ($N=7$), (2) textual definitions only ($N=14$), (3) visual illustrations only ($N=7$), and (4) a combination of both types of annotations ($N=7$). Textual annotations consisted of simple English translations while visual illustrations were all photographic representations of the key words. As needed, portions of the photographs contained arrows or circles to indicate precisely which part of the photo represented the key word. For example, upon selecting a key word in the textual-definitions program, the keyword and its definition appeared on the right side of the screen (Fig. 6.2). In contrast, accessing the same key word in the visual illustrations only treatment displayed a photograph with the key word (Fig. 6.3) and in the text and visual combination treatment the textual definition appeared along with an illustration (Fig. 6.4).

Fig. 6.2 Listening activity screenshot for the textual definitions only treatment

Fig. 6.3 Listening activity screenshot for the visual illustrations only treatment

After the final listening screen, participants were directed by hyperlink to the online posttest and survey appropriate to their version of the activity. The survey and quiz were created with different software and were hosted on a different server.

The posttest consisted of one open-ended comprehension question and 25 multiple-choice vocabulary questions. This assessment was similar to the posttest used

Fig. 6.4 Listening activity screenshot for the combination textual definitions and visual-illustrations treatment

in the Jones and Plass (2002) study, which used the same type of comprehension and vocabulary quizzes. The comprehension question asked participants to "Please summarize what you have learned about San Fermines and the Running of the Bulls. Include everything you can remember and write in English." Because participants were beginning-level Spanish students, English was used to assess comprehension so that their limited Spanish language proficiency and writing ability would not interfere with the measurement of their comprehension. The researcher identified 32 distinct propositions in the content of the listening activity and participant responses were evaluated according to the number of propositions identified.

The vocabulary quiz consisted of 25 multiple-choice items. The question stems provided a key word in Spanish and asked participants to select the correct English translation from a set of four possible answers. The translations were identical to the textual annotations provided in two of the treatments. A sample question follows:

Select the correct translation: el herido

(a) Belt
(b) Balcony
(c) Injury (correct answer)
(d) Horns

Following the vocabulary quiz, but within the same assessment screen, students were presented with a series of survey questions. The survey consisted of five cognitive load questions, 14 Likert-type attitude questions, and three open-ended questions.

The five cognitive load measurement questions were based on the NASA-TLX assessment, originally developed by Hart and Staveland (1988) to measure cognitive load. The NASA-TLX measure was selected because it is the most commonly used measure of cognitive load and because it has a good record of validity and reliability (Hill et al., 1992). Gerjets, Scheiter, and Catrambone (2004) and Scheiter, Gerjets, and Catrambone (2006) successfully used a modified version of the NASA-TLX to measure cognitive load in their research and Su (2007) followed their model in her dissertation study. The fifth question from the survey, which addresses the students' perceived stress level, follows:

How stressed (insecure, discouraged, irritated, annoyed) did you feel during the learning task?

	1	2	3	4	5	6	7	8	9	10	
Not stressed at all	○	○	○	○	○	○	○	○	○	○	Very stressed

The attitude portion of the questionnaire included 14 Likert-type questions to elicit general reactions to the listening activity. Participants were asked for their opinions about the activity's organization, relevance, interest, ease of use, and its ease of navigation. Three sample questions from the survey follows:

		1	2	3	4	5	
The program was well designed and organized	Strongly disagree	○	○	○	○	○	Strongly agree
The topic of the program was relevant to my Spanish study	Strongly disagree	○	○	○	○	○	Strongly agree
The listening activity helped me to learn about the cultural topic	Strongly disagree	○	○	○	○	○	Strongly agree

Participants were also asked to what extent the activity helped them learn new vocabulary and new cultural information and whether they would like to have more activities of this type within the class. Additionally, depending on the treatment group, they were asked to indicate how hearing individual key words, reading translations, and seeing illustrations helped them to understand the description and to learn new vocabulary. The text translation and illustration questions were only asked of participants in the corresponding treatment groups. Three sample questions from this part of the survey follows. The all-capital letter formatting of LEARN and UNDERSTAND was used in the survey to emphasize the difference between question pairs.

		1	2	3	4	5	
Hearing the keywords pronounced alone helped me to LEARN the new words	Strongly disagree	○	○	○	○	○	Strongly agree
Reading the English translations of keywords helped me to UNDERSTAND the story	Strongly disagree	○	○	○	○	○	Strongly agree
Seeing the graphics illustrating keywords helped me to LEARN the new words	Strongly disagree	○	○	○	○	○	Strongly agree

Three open-ended questions followed, which asked participants how the vocabulary annotations could be made more effective, what they liked best about the activity, and what could be done to improve it. A sample open-ended question from the survey follows:

How could we make the vocabulary (definitions, pronunciations, illustrations) more effective for you?

Participants' time-in-program was also logged by the instructional program and data were sent to the researcher via email for collection and analysis. The log included a unique, randomly generated identification number so that the time stamps could be correlated with the treatment group and survey responses of the correct participant. Data from the logs were entered into a spreadsheet and the time each student spent on each individual screen, as well as the overall time spent in-program were calculated.

Data Analysis

Posttest and survey results data were extracted from the online assessment program and entered into SPSS for analysis. Separate 2×2 Analysis of Variance (ANOVA) was performed to evaluate the effects of textual definitions and visual illustrations on aural comprehension, vocabulary acquisition, and cognitive load. Descriptive statistics were calculated on the attitudes section of the questionnaire and the time-in-program logs.

Results

Results for the aural comprehension posttest, vocabulary posttest, and cognitive load survey results are presented below in order according to the three research questions. The first research question is related to the effects of textual

Table 6.1 Means and standard deviations for aural comprehension measure

Textual-definitions treatment		Visual-illustrations treatment: Visual illustrations excluded	Visual-illustrations treatment: Visual illustrations included	Total
Textual definitions excluded	*M*	5.29	10.14	7.71
	SD	2.93	5.64	4.99
	n	7	7	14
Textual definitions included	*M*	7.29	11.29	8.62
	SD	4.50	6.56	5.45
	n	14	7	21
Total	*M*	6.62	10.71	8.26
	SD	4.08	5.90	5.22
	n	21	14	35

Note: The maximum score was 32 comprehension propositions recalled

and visual annotation on aural comprehension and on vocabulary acquisition. We will present results from the comprehension and vocabulary measures separately.

Aural Comprehension

The mean and standard deviation for aural comprehension performance by textual definitions (excluded and included) and visual illustrations (excluded and included) are presented in Table 6.1. The overall mean score for all participants was 8.26 (SD = 5.22). The mean score for participants in the textual definitions excluded treatment was 7.71 (SD = 5.00), while the overall mean for the textual definitions included treatment was 8.62 (SD = 5.45). The overall mean for the visual illustrations excluded treatment was 6.62 (SD = 4.08) and the overall mean score for the visual illustrations included treatment was 10.71 (SD = 5.90). Participants in the no-annotations treatment (textual definitions and visual illustrations excluded) achieved a mean score of 5.29 (SD = 2.93) while students in the visual illustrations only (textual definitions excluded) treatment scored a mean of 10.14 (SD = 5.64). The mean for the textual definitions only treatment (visual illustrations excluded) was 7.29 (SD = 4.50) which contrasts with a mean score of 11.29 (SD = 6.56) for the combination treatment of textual definitions and visual illustrations.

A 2 × 2 ANOVA was conducted to examine the effects of the visual-illustrations treatment and the textual-definitions treatment on aural comprehension posttest scores. Table 6.2 provides a summary of the ANOVA scores. The results indicated a main effect for the visual-illustrations treatment, $F(1, 35) = 6.38$, $p < .05$. There was no significant effect for the textual-definitions treatment and there were no significant interactions between treatments.

Table 6.2 ANOVA summary table for comprehension posttest achievement scores by textual definition and visual illustration conditions

Source	*df*	*F*	Partial η^2	*p*
Textual-definitions treatment	1	.80	.025	.38
Visual-illustrations treatment	1	6.38	.017	.02*
Text × visual	1	.06	.002	.81
Error	31	(762.57)		

Values enclosed in parentheses represent mean square errors
$^{*}p<.05$

Table 6.3 Means and standard deviations for vocabulary acquisition posttest

		Visual-illustrations treatment		
Textual-definitions treatment		Visual illustrations excluded	Visual illustrations included	Total
Textual definitions excluded	*M*	16.29	20.29	18.29
	SD	3.50	4.39	4.34
	n	7	7	14
Textual definitions included	*M*	21.21	20.00	20.81
	SD	4.02	3.37	3.78
	n	14	7	21
Total	*M*	19.57	20.14	19.80
	SD	4.46	3.76	4.14
	n	21	14	35

Note: The maximum score was 25 points

Vocabulary Acquisition

The mean scores and standard deviations for vocabulary acquisition posttest performance by textual definitions (excluded and included) and visual illustrations (excluded and included) are presented in Table 6.3. The overall mean score for all participants was 19.80 (SD = 4.14). The mean score for participants in the textual definitions excluded treatment was 18.29 (SD = 4.34), while the overall mean for the textual definitions included treatment was 20.81 (SD = 3.78). The overall mean for the visual illustrations excluded treatment was 19.57 (SD = 4.46) and the overall mean score for the visual illustrations included treatment was 20.14 (SD = 3.76). Participants in the no-annotations treatment (textual definitions and visual illustrations excluded) achieved a mean score of 16.29 (SD = 3.50) while students in the visual illustrations only (textual definitions excluded) treatment scored a mean of 20.29 (SD = 4.39). The mean for the textual definitions only treatment (visual illustrations excluded) was 21.21 (SD = 4.02) which contrasts with a mean score of 20.00 (SD = 3.37) for the combination treatment of textual definitions and visual illustrations.

Table 6.4 Means and standard deviations for participant ratings of task demand (1 = easy, 10 = demanding)

		Visual-illustrations treatment		
Textual-definitions treatment		Visual illustrations excluded	Visual illustrations included	Total
Textual definitions excluded	*M*	6.43	7.00	6.69
	SD	2.76	2.10	2.39
	n	7	7	14
Textual definitions included	*M*	5.07	5.57	5.24
	SD	1.82	1.90	1.81
	n	14	7	21
Total	*M*	5.52	6.23	5.79
	SD	2.21	2.05	2.14
	n	21	14	35

A 2×2 ANOVA was conducted to test the effects of the visual-illustrations treatment and the textual-definitions treatment on vocabulary acquisition posttest scores. The ANOVA yielded no significant difference for any of the variables, nor were there any interaction effects.

Cognitive Load

The Cognitive Load measure consisted of five questions to address various aspects of cognitive load. All questions were scored on a scale of 1–10 and each is presented separately below.

Task demand. The question, "How much mental and physical effort was required? Was the learning task easy or demanding?" was rated on a scale of one to ten, from "easy" to "demanding." The mean scores and standard deviations for this question by textual definitions (excluded and included) and visual illustrations (excluded and included) are presented in Table 6.4.

The overall mean score for all participants was 5.79 (SD = 2.14). The mean rating for all participants was 5.79 (SD = 2.14). The mean rating for participants in the textual definitions excluded treatment was 6.69 (SD = 2.39), while the mean for the textual definitions included treatment was 5.24 (SD = 1.81). The overall mean for the visual illustrations excluded treatment was 5.52 (SD = 2.21) and the overall mean rating for the visual illustrations included treatment was 6.23 (SD = 2.05). Participants in the no-annotations treatment (textual definitions and visual illustrations excluded) gave a mean rating of 6.43 (SD = 2.76) while students in the visual illustrations only treatment (textual definitions excluded) responded with a mean of 7.00 (SD = 2.10). The mean for the textual definitions only treatment (visual illustrations excluded) was 5.07 (SD = 1.82) compared with a mean rating of 5.57 (SD = 1.90) for the combination treatment of textual definitions and visual illustrations.

Table 6.5 Means and standard deviations for participant ratings of hard work (1 = not hard at all, 10 = very hard)

		Visual-illustrations treatment		
Textual-definitions treatment		Visual illustrations excluded	Visual illustrations included	Total
Textual definitions excluded	*M*	6.57	5.83	6.05
	SD	2.94	2.14	2.16
	n	7	7	14
Textual definitions included	*M*	5.79	5.14	5.57
	SD	1.72	3.02	2.18
	n	14	7	21
Total	*M*	6.23	5.46	5.82
	SD	2.52	2.57	2.30
	n	21	14	35

A 2×2 ANOVA was conducted to test the effects of the visual-illustrations treatment and the textual-definitions treatment on the student ratings on the "demanding" question. The results indicated that there were no main effects for either variable and there were no interaction effects *Hard work*. The mean scores and standard deviations for the question, "How hard did you have to work to understand the contents of the learning environment?" are presented in Table 6.5 by textual definitions (excluded and included) and visual illustrations (excluded and included). This question was rated on a ten-point scale, from "not hard at all" to "very hard." The mean rating for all participants was 5.82 (SD = 2.30). The overall mean rating for participants in the textual definitions excluded treatment was 6.05 (SD = 2.16), and the overall mean for the textual definitions included treatment was 5.57 (SD = 2.18). The overall mean for the visual illustrations excluded treatment was 6.23 (SD = 2.52) while the overall mean score for the visual illustrations included treatment was 5.46 (SD = 2.57). Participants in the no-annotations treatment (textual definitions and visual illustrations excluded) gave a mean rating of 6.57 (SD = 2.94) while students in the visual illustrations only (textual definitions excluded) treatment responded with a mean of 5.83 (SD = 2.14). The mean for the textual definitions only treatment (visual illustrations excluded) was 5.79 (SD = 1.72) compared with a mean rating of 5.14 (SD = 3.02) for the combination treatment of textual definitions and visual illustrations.

A 2×2 ANOVA was conducted to test the effects of the visual-illustrations treatment and the textual-definitions treatment on student ratings on the "hard work" question. The results indicated that there were no main effects for either variable and there were no interaction effects.

Feeling of success. The mean scores and standard deviations for the question, "How successful do you think you were in your attempt to understand the contents of the learning environment?" are presented in Table 6.6 by textual definitions (excluded and included) and visual illustrations (excluded and included). This question was also rated on a ten-point scale, from "not successful" to "very successful." The mean rating for all participants was 5.53 (SD = 2.18).

Table 6.6 Means and standard deviations for participant ratings of feeling of success (1 = not successful, 10 = very successful)

Textual-definitions treatment		Visual-illustrations treatment: Visual illustrations excluded	Visual-illustrations treatment: Visual illustrations included	Total
Textual definitions excluded	*M*	3.71	5.83	4.69
	SD	1.80	1.60	1.97
	n	7	7	14
Textual definitions included	*M*	5.57	7.00	6.05
	SD	2.34	1.53	2.18
	n	14	7	21
Total	*M*	4.95	6.46	5.53
	SD	2.31	1.61	2.18
	n	21	14	35

Table 6.7 ANOVA summary table for feeling of success

Source	*df*	*F*	Partial η^2	*p*
Textual-definitions treatment	1	4.45	.13	.04*
Visual-illustrations treatment	1	6.12	.17	.02*
Text × visual	1	.91	.63	.23
Error	30	(117.69)		

Values enclosed in parentheses represent mean square errors
$^{*}p > .05$

The overall mean rating for participants in the textual definitions excluded treatment was 4.69 (SD = 1.97), while the overall mean for the textual definitions included treatment was 6.05 (SD = 2.18). The overall mean for the visual illustrations excluded treatment was 4.95 (SD = 2.31) and the overall mean rating for the visual illustrations included treatment was 6.46 (SD = 1.61). Participants in the no-annotations treatment (textual definitions and visual illustrations excluded) responded with a mean rating of 3.71 (SD = 1.80) while students in the visual illustrations only (textual definitions excluded) treatment recorded a mean of 5.83 (SD = 1.60). The mean for the textual definitions only treatment (visual illustrations excluded) was 5.57 (SD = 2.34), which contrasts with a mean rating of 7.00 (SD = 1.53) for the combination treatment of textual definitions and visual illustrations.

A 2 × 2 ANOVA was conducted to test the effects of the visual-illustrations treatment and the textual-definitions treatment on student responses to the "feel successful" question. Table 6.7 provides a summary for the ANOVA scores. The results indicated a main effect for the textual-definitions treatment, $F(1, 35) = 4.45$, $p < .05$, and for the visual-illustrations treatment, $F(1, 35) = 6.12$, $p < .05$. Scores were significantly higher for participants who received textual translations as compared to those who did not. Likewise students scored higher on the posttest in the visual illustrations included groups as compared to those in the visual illustrations excluded groups. There were no interaction effects.

Table 6.8 Means and standard deviations for participant ratings of navigation effort (1 = low effort, 10 = high effort)

Textual-definitions treatment		Visual-illustrations treatment: Visual illustrations excluded	Visual-illustrations treatment: Visual illustrations included	Total
Textual definitions excluded	*M*	2.71	2.33	2.54
	SD	2.06	1.97	1.94
	n	7	7	14
Textual definitions included	*M*	3.93	3.43	3.76
	SD	2.87	3.36	2.97
	n	14	7	21
Total	*M*	3.52	2.92	3.29
	SD	2.64	2.75	2.66
	n	21	14	35

Navigation effort. The mean scores and standard deviations for the question, "How much effort did you have to invest to navigate the learning environment?" are presented in Table 6.8 by textual definitions (excluded and included) and visual illustrations (excluded and included). This question was scored on a ten-point scale, from "low effort" to "high effort." Therefore, the lower the score, the more easy it was for participants to navigate the program and the lower their level of extrinsic cognitive load. The mean rating for all participants on this question was 3.29 (SD = 2.66), indicating that all participants found the program relatively easy to navigate. The overall mean rating for participants in the textual definitions excluded treatment was 2.54 (SD = 1.94), while the overall mean for the textual definitions included treatment was 3.76 (SD = 2.97). The overall mean for the visual illustrations excluded treatment was 3.52 (SD = 2.64) and the overall mean rating for the visual illustrations included treatment was 2.92 (SD = 2.75). Participants in the no-annotations treatment (textual definitions and visual illustrations excluded) responded with a mean rating of 2.71 (SD = 2.06) while students in the visual illustrations only (textual definitions excluded) treatment rated this question with a mean of 2.33 (SD = 1.97). The mean for the textual definitions only treatment (visual illustrations excluded) was 3.93 (SD = 2.87), which contrasts with a mean of 3.43 (SD = 3.36) for the combination treatment of textual definitions and visual illustrations.

A 2 × 2 ANOVA was conducted to test the effects of the visual-illustrations treatment and the textual-definitions treatment on student responses to the "ease of navigation" question. The results indicated no main effects for either treatment and no interaction effects.

Stress levels. The mean scores and standard deviations for the question, "How stressed did you feel during the learning task?" are presented in Table 6.9 by textual definitions (excluded and included) and visual illustrations (excluded and included). Participants rated the question on a ten-point scale, from "not at all" to "extremely." The mean rating for all participants was 3.18 (SD = 2.43), indicating a relatively low-stress level. The overall mean rating for participants in the textual definitions

Table 6.9 Means and standard deviations for stress levels (1 = not at all, 10 = extremely)

Textual-definitions treatment		Visual-illustrations treatment: Visual illustrations excluded	Visual illustrations included	Total
Textual definitions excluded	*M*	3.43	3.00	3.23
	SD	2.30	3.63	2.86
	n	7	7	14
Textual definitions included	*M*	3.21	3.00	3.14
	SD	2.36	2.00	2.20
	n	14	7	21
Total	*M*	3.29	3.00	3.18
	SD	2.28	2.74	2.43
	n	21	14	35

excluded treatment was 3.23 (SD = 2.86), while the overall mean for the textual definitions included treatment was 3.14 (SD = 2.20). The overall mean for the visual illustrations excluded treatment was 3.29 (SD = 2.28) and the overall mean rating for the visual illustrations included treatment was 3.00 (SD = 2.74). Participants in the no-annotations treatment (textual definitions and visual illustrations excluded) responded with a mean rating of 3.43 (SD = 2.30) while students in the visual illustrations only (textual definitions excluded) treatment rated this question with a mean of 3.00 (SD = 3.63). The mean for the textual definitions only treatment (visual illustrations excluded) was 3.21 (SD = 3.26), which contrasts with a mean of 3.00 (SD = 2.00) for the combination treatment of textual definitions and visual illustrations.

A 2 × 2 ANOVA was conducted to test the effects of the visual-illustrations treatment and the textual-definitions treatment on student responses to the "stress" question. The results indicated no main effects for either treatment and no interaction effects.

Participant Attitude Survey Scores by Item

A set of Likert-type questions was used to measure student perceptions of how well the program was designed. Table 6.10 contains a full list of questions along with mean scores and standard deviations for participant responses. Questions are presented in the order in which they appeared to study participants. For ease of data presentation, the questions are numbered from 1 to 14 although in the survey the items were numbered 36 and 37 with multiple prompts in each question. The response scale was from one to five, from strongly disagree to strongly agree, thus a higher number indicates stronger agreement with the given statement. The range of mean scores was from 3.17 to 4.66, and the overall mean score for all questions was 4.06 (SD = .44).

Table 6.10 Overall mean scores and standard deviations for attitude survey questions

Item	Mean	SD
1. The program was well designed and organized	4.11	1.08
2. The topic of the program was relevant to my Spanish study	4.17	1.18
3. The story was interesting to me	4.06	1.24
4. Instructions within the program were clear and easy to follow	4.43	.95
5. Navigation within the program was easy to understand	4.66	.80
6. The listening activity helped me to learn new vocabulary	3.77	1.14
7. The listening activity helped me to learn about the cultural topic	4.11	1.13
8. I would like to have more listening activities of this type to help me understand spoken Spanish	3.60	1.33
9. Hearing the keywords pronounced alone helped me to LEARN the new words (all groups)	3.34	1.21
10. Hearing the keywords pronounced alone helped me to UNDERSTAND the story (all groups)	3.17	1.22
11. Reading the English translations of keywords helped me to LEARN the new words (textual definitions only and combination groups)	4.33	.91
12. Reading the English translations of keywords helped me to UNDERSTAND the story (textual definitions only and combination groups)	4.29	.96
13. Seeing the graphics illustrating keywords helped me to LEARN the new words (visuals only and combination groups)	4.21	.97
14. Seeing the graphics illustrating keywords helped me to UNDERSTAND the story (visuals only and combination groups)	4.57	.76

Note: All items were rated on a five-point scale from strongly disagree to strongly agree

The first eight questions elicited participant attitudes towards the overall design of the instructional program. In response to the design and organization question participants gave a mean score of 4.11 (SD = 1.08). Participants also rated the relevance of the program positively, resulting in a mean score of 4.17 (SD = 1.18). The interest of the story was rated favorably with a mean score of 4.06 (SD = 1.24). Participants rated the clarity of the instructions with a mean of 4.43 (SD = .95) and ease of navigation with a mean of 4.66 (SD = .80). The statement that the program helped them learn new vocabulary was rated lower, with a mean of 3.77 (SD = 1.14). Participants indicated that the program helped them learn about the cultural topic with a mean score of 4.11 (SD = 1.13). The lowest scoring question of this section of the survey was the statement that they would like to have more activities of this type in their regular Spanish class, which scored a mean of 3.60 (SD = 1.33).

Questions 9 through 14 of Table 6.10 are related to the effectiveness of the vocabulary annotations participants accessed within the program. Questions 9 and 10 were given to participants in all treatments, while questions 11 and 12 were only given to participants in the textual-definitions-included treatment and questions 13 and 14 were offered only to participants in the visual-illustrations-included treatment.

Questions 9 and 10 were the two lowest-rated items in the survey. Question nine, "Hearing the keywords pronounced alone helped me to learn the new words" had a mean score of 3.34 (SD = 1.21). Participants rated question 10, "Hearing the keywords pronounced alone helped me to understand the story" with a mean of 3.17 (SD = 1.22).

Table 6.11 Vocabulary aid improvements: summary of participant responses

	Responses by annotation treatment				
Item	None	Text	Visual	Both	Total
38. How could we make the vocabulary pronunciation aids more effective for you?					
Vocabulary aids were acceptable	2	3	3	3	11
(More/better) visual illustrations	0	4	3	0	7
(More) textual definitions or translations	2	0	1	0	3
Vocabulary practice activities	1	1	0	0	2
Video illustrations	0	0	0	1	1
Full transcript of audio	0	1	0	0	1
Other	1	3	1	3	8

Note: Annotation treatment group names in the responses columns refer to no-annotations, textual-definitions-only, visual-illustrations-only, and both-annotation types, respectively

The textual-definitions questions, numbers 11 and 12, were rated more highly, however. Question 11, “Reading the English translations of keywords helped me to learn the new words” had a mean rating of 4.22 (SD = .91). Question 12, “Reading the English translations of keywords helped me to understand the story” had a mean score of 4.29 (SD = .96).

Likewise, visual-illustration questions, numbers 13 and 14, were rated highly. “Seeing the graphics illustrating keywords helped me to learn the new words,” question 13 had a mean score of 4.21 (SD = .97). Question 14, “Seeing the graphics illustrating keywords helped me to understand the story” received the second highest score of the survey with a mean of 4.57 (SD = .97).

Open-Ended Survey Question Responses

Participants responded to three open-ended questions at the end of the survey. Actual question numbers in the survey were 38, 39, and 40. Each question is presented in turn below, with participant responses from each treatment group.

Vocabulary aid improvements. The first open-ended question, number 38, was “How could we make vocabulary aids (and definitions/illustrations) more effective?” The words in parentheses varied based on the treatment group since groups received different types of vocabulary annotations. Table 6.11 contains a summary of responses to this question. We will describe the overall results first and then summarize responses by treatment group.

Of the 35 participants in the study, 30 responded to this question. The most common response, 11 responses total, for all groups was that the vocabulary aids were acceptable in their current form. This even was true for the no-annotations group, which only received keyword pronunciation helps. The second most common response, with seven respondents, was that they would like to see more or better visual illustrations. Three responses indicated a desire for more textual definitions. None of those comments came from the textual-definitions-only group or the both-annotations group, which both accessed keyword definitions. Other respondents indicated a desire for practice activities prior to the test (one response), a desire for video illustrations (one response), and a desire for a full transcript of the audio to read (one response). Responses that fell into the "other" category dealt with potential technical issues on the student's computer, included comments that did not directly answer the question, or referred to the posttest rather than the listening activity itself.

Six of seven participants in the no-annotations group responded to this question. Two of the six students stated that the activity was just "fine"; however, two other students requested translations of key words. One of the seven students wanted vocabulary exercises and one other student simply stated that the words were new.

Eleven of the 14 participants in the textual-definitions-only group responded to this question. Three of the 14 students were satisfied with what they saw; writing that the program is "good as it is" or that it is "already effective." Three others commented that they would like to have had a picture to accompany the definition. One participant wanted an introduction screen with all of the keywords listed in one place. One participant wanted to see the keywords used in a sentence or have vocabulary practice activities. One participant wanted the "whole speech in English and Spanish… written out so it can be seen." One participant stated that he or she "did not fully understand all of the words."

All seven participants in the visual-illustrations-only group responded to this question. Their responses reflected similar ideas to the textual-definitions-only group. Three of the seven students liked the activity as it was. One wanted more pictures and one wanted text translations along with the pictures. One participant commented that some of the illustrations were ambiguous. She couldn't tell if a picture of a park with a shade tree meant grass or tree. She wrote that she learned the word while taking the quiz since tree wasn't an option. One student claimed that he or she, "did not have the pics to see" although no other reports of program malfunction have come to the researcher's attention.

Six of the seven participants in the both-annotations treatment group responded to this question. Two of the six respondents stated that they couldn't think of any way to improve the program. One person stated that the "illustrations were very good as well as the pronunciation aids," but requested adding more vocabulary keywords. One student suggested including both English and Spanish pronunciation. Another participant expressed a desire for video instead of still photos for some words. One participant asked for the ability to click on individual words to hear them before moving on to the next screen. Since this was a feature of the program, evidently it was not clear enough to this student that you can click on individual key words at any time to hear them pronounced.

Program likes. The second open-ended question, number 39, was, "What did you like best about the program?" A summary of participant responses is found in Table 6.12. Again, we will describe the overall results and then discuss responses from each treatment group in turn.

Of the 35 participants, 32 responded to this question. The most common responses were that they liked the visual illustrations (six responses) and that they

Table 6.12 Program likes: summary of participant responses

	Responses by annotation treatment				
Item	None	Text	Visual	Both	Total
39. What did you like best about the program?					
Navigation and program structure	0	3	1	2	6
Visual illustrations	0	2	3	1	6
Cultural topic or story	3	0	0	2	5
Pronunciation aids	2	0	1	1	4
Pace of the audio	1	1	0	2	4
Learning new vocabulary	0	2	0	0	3
Textual definitions	0	2	0	0	2
Listening activity	0	2	0	0	2
Key words listed	0	0	2	0	2
Other (multiple-choice questions)	1	0	0	0	1

Note: Annotation treatment group names in the responses columns refer to no-annotations, textual-definitions-only, visual-illustrations-only, and both-annotation types, respectively

liked the navigation and program structure (six responses). The cultural topic was another favorite (five responses) as was the pace of the audio (four responses) and the pronunciation aids (four responses). Learning new vocabulary, seeing textual definitions, the listening activity format, and the list of key words each received two comments.

All seven participants in the no-annotations group responded to this question. Two commented that they liked hearing the pronunciation of key words and one stated a liking for the "clear and slow reading." Three comments noted a liking for the story or content. For example, one participant wrote that the cultural topic was "fascinating" and another called the activity "fun." Two participants wrote that they liked the multiple-choice questions, which were in fact part of the assessment, not the activity.

Twelve of 14 participants in the textual-definitions-only group responded to this question; one of which gave multiple items in the response. Four participants wrote that they liked the structure of the program; commenting on the simplicity of the program, how easy it was to navigate, how you could pause and replay sections, and how the program was divided into brief sections. Three participants stated that they liked the fact that it was a listening activity. Two participants stated that they liked learning the new vocabulary and two others liked the fact that they could see the definitions in English. Two students stated that they liked the visuals included in the presentations, even though this group only saw decorative images for each of the five listening segments, not illustrations of keywords. One participant stated a preference for the slow speed of the speech in the presentation.

All seven of the participants in the visual-illustrations-only group responded to this question. Three of the seven participants mentioned a preference for the visual-illustrations of key words. Two wrote that they liked the fact that there were key-words listed on screen. One participant liked the easy navigation, another liked the slow speed of the speech, and another liked the pronunciation aids.

Table 6.13 Program improvements: summary of participant responses

	Responses by annotation treatment				
Item	None	Text	Visual	Combo	Total
40. What could be done to improve the program?					
(More) textual definitions or translations	3	3	1	0	7
(More/better) visual illustrations	0	3	2	0	5
Nothing	0	1	1	3	5
Full transcript of audio	1	2	0	1	4
Vocabulary practice activities	2	0	0	1	3
Video illustrations	1	1	1	0	3
Slower audio	0	1	1	0	2
Other (technical, instructions)	0	2	1	1	3

Note: Annotation treatment group names in the responses columns refer to no-annotations, textual-definitions-only, visual-illustrations-only, and both-annotation types, respectively

Six of the seven participants in the combination-annotations group responded to this question. Three of the six participants liked the topic, describing it as "interesting." Two of the six participants commented on the manageable speed of the speech, one stating that it was "natural but was just slow enough for me to follow." One mentioned that the navigation was easy and visual layout of the program was "pleasing to the eye." Another participant stated a preference for hearing the pronunciation of key words. *Program improvements*. The final open-ended question, number 40, was, "What could be done to improve the program?" A summary of participant responses is found in Table 6.13.

Of the 35 participants, 32 responded to this open-ended question. The most common response was a desire for more textual definitions or translations (seven responses). Five comments indicated that there was a need for more visual illustrations and five stated that the program needed nothing. Four participants asked for a full transcript of the audio that they could read while listening. Three students requested practice activities and three other respondents wanted video illustrations. Although in the previous question, participants said that the speed of audio was the strength of the program, two responses to this question asked for the audio to be slowed down. Three responses fell into the "other" category because they did not address the question directly.

All seven participants in the no-annotations group responded to this question. Three of the seven participants listed a desire for English translations and definitions; one of these three wanted a complete translation of the story in English. Two of the seven participants requested practice activities after each screen; one of the two stating that it would improve comprehension. One of the seven participants stated a desire for a video presentation and another asked for text to read along in Spanish.

Eleven of the 14 participants in the textual-definitions-only group responded to this question. Three of the 11 respondents requested pictures of the keywords. Three participants wanted more translations of keywords and one of these three wanted a translation of the entire story. One participant stated that nothing is needed, one

Table 6.14 Time-in-program

Group	Range	Mean	SD
No-annotations group	.50–17.22	7.49	5.90
Textual-definitions-only group	2.52–17.78	8.19	3.99
Visual-illustrations-only group	6.28–37.32	12.03	11.22
Both-annotations group	8.70–89.33	24.81	29.03
Overall	.50–89.33	12.14	15.07

Note: Times are expressed in minutes

asked for slower talking, and another wanted videos instead of images. One participant listed a possible technical problem, stating that the sound faded out during the presentation.

All seven of the participants in the visual-illustrations-only group responded to this question. Two of the respondents wanted more pictures in the program. One participant requested slower speech, and another one asked for some indication that a keyword had been accessed already. One respondent wanted motion multimedia instead of static photographs. One participant expressed frustration with the level of the program, stating that she listened to each section three or four times and then gave up and moved on. One participant noted that no improvement was needed.

All seven participants in the combination group responded to this question. Three participants commented that nothing was needed. However, one participant requested more vocabulary and a list of words at the beginning and end before taking the quiz. Another asked for full text so that students could read along with the audio. *Participant time in program.*

Additional data were collected to investigate time-in-program. The time participants spent in the program was captured in a log and sent to the researcher via email. Logs only recorded time participants spent in the introduction and on the listening screens. Time was not captured for the quiz or survey.

Since this activity was not done in a controlled environment, the data reflect inconsistencies among the way participants completed the program, making statistical analysis and comparisons problematic. A few of the logs indicated that the program was likely sitting idle for long periods of time, in one case for 9 min on the opening screen, but in another case it was idle for 1 h and 23 min on one presentation screen. Other logs indicated that the participant didn't spend enough time in the program to listen to the presentation. One participant in the no-annotations treatment group was in the entire program for a total of 30 s and another was in-program for 50 s. Given these limitations, the time students spent in the program will be examined.

Table 6.14 lists the time-in-program, means and standard deviations for each treatment group. The overall mean time spent in-program for all participants was 12.14 min (SD = 15.07) and the range of times was from .50 to 89.33 min. The lowest time-in-program was recorded for the no-annotations group with a mean time of 7.49 min (SD = 5.90) and a range of .40–17.22 min. The next highest time was recorded for the textual-definitions-only group with a mean of 8.19

(SD = 3.99) and a range of 2.52–13.97 min. The second highest time was recorded for the visual-illustrations-only group with a mean time of 12.03 min (SD = 11.22) and a range of 6.28–37.32 min. The highest time-in-program was recorded for the both-annotations group with a mean of 24.81 min (SD = 29.03) and a range of 8.70–89.33 min.

Discussion

This study included an examination of the effects of textual and visual annotations on Spanish listening comprehension, incidental vocabulary acquisition, and cognitive load. Students who participated in the study were assigned to one of four variations of an online listening activity about the Sanfermines and the Running of the Bulls in Pamplona, Spain. Depending on the treatment group, participants received no keyword annotations, textual annotations only, visual annotations or both types of annotations. Participants then completed a comprehension and vocabulary posttest along with a cognitive load and attitude survey. Additionally, an analysis time-in-program was completed through examining program-created time logs.

Aural Comprehension

Results of the Spanish comprehension posttest indicated a significant difference for the visual-illustrations treatment. Students who received visual illustrations of keywords in the program scored higher on the posttest, recalling more propositions from the story than those participants who did not.

No other significant differences were found for aural comprehension; however, the scores for students in the textual-definitions-included treatment groups scored slightly higher than those in the textual-definitions-excluded treatments. The students in the both-annotations group scored slightly higher than did students in any of the other groups as well, but not significantly so. Earlier studies (Ginther, 2002; Jones & Plass, 2002; Yoshii, 2006) found significant differences for the textual-annotation treatments in their studies. With more participants the differences observed in this study may result significant for this population as well.

This result is similar to findings in earlier listening comprehension studies (Ginther, 2002; Jones & Plass, 2002; Yoshii, 2006). On the other hand, the result partially contrasts with Ariew and Ercetin (2004) who found that students liked the illustrations in their studies but that they also had a negative effect on comprehension.

Krashen's monitor model of second language acquisition (Gass & Selinker, 1994; Krashen, 1985; Lafford & Salaberry, 2003) offers some explanation for the results of the current study. According to the monitor model, students acquire language by attending to aural input that is just above their current level of competency, but the input can only become intake and be acquired if the student has sufficient extralinguistic cues to make sense of what he or she is hearing. The addition of pictures in the visual-illustrations treatment may satisfy this requirement.

The results also support Mayer's multimedia theory of learning. The multimedia principle and the modality principle indicate that students learn better when information is presented in verbal and pictorial forms (Low & Sweller, 2005; Mayer, 2001). By adding images to the aural Spanish language presentation, the language became more comprehensible for students and they were able to construct verbal and pictorial mental models of the content, resulting in improved comprehension posttest scores.

Incidental Vocabulary Acquisition

Results of statistical analysis on the vocabulary posttest indicated no significant difference for textual definitions or visual illustrations. However, scores were lower for the no-annotations group than the other three groups. Having annotations of some type seems to have made a difference, although not enough to reach a statistically significant level. Earlier studies (Ginther, 2002; Jones & Plass, 2002) resulted in significance for this variable, indicating that annotations improved vocabulary acquisition as well as comprehension. Therefore, with more participants significant differences may emerge.

One factor that may have had a role in the vocabulary posttest results is the type of assessment questions that students were given. Jones (2004) found that students performed better on posttest items that matched the content of the treatment they received in the program. That is, if a student received visual illustrations in the program, they were better able to answer test items that included a picture as compared to those that used translations as the prompts. Likewise, students who received textual definitions in-program performed better on the post test when given text rather than pictorial vocabulary prompts. If students in the visual-illustrations treatments for this study were tested with items that matched the presentation they saw, they may have performed significantly better.

Attitude survey results reflect the posttest findings and suggest alignment between learning achievement and student preferences. Students agreed more strongly with the statement that the keyword illustrations helped them to learn about the cultural topic than with the statement that the keyword illustrations helped them to learn vocabulary. Another pair of attitude survey items also reflects the posttest results for aural comprehension and vocabulary acquisition. Students rated their agreement with the statement that the activity helped them learn about the cultural topic higher than they rated the statement that the program helped them learn vocabulary.

Cognitive Load

Prior to this study, cognitive load had not been measured in other research on visual and textual annotations in Spanish listening or reading comprehension activities. Drew conclusions from their research results to support cognitive load theory, but did not attempt to measure it directly or indirectly via survey or other instrumentation. Jones and Plass (2002) and Jones (2004) both encouraged research in this area.

The cognitive load measure for the current study consisted of five questions based on the NASA-TLX instrument developed originally by Hart and Staveland (1988) and subsequently modified and used by other researchers (Gerjets et al., 2004; Scheiter et al., 2006; Su, 2007). Only one of the five questions resulted in significant differences among treatment groups: feeling of success. It is possible that the instrument is less sensitive than the original survey due to the fact that the survey tool had only ten gradations for each item response instead of the 20 gradations in the original. Each of the cognitive load questions are discussed in turn below in the order in which they were presented to students.

Task demand. Task demand relates to the *intrinsic* dimension of cognitive load since the question attempts to measure how naturally complex the learning task was for students. Although not statistically significant, results of the task-demand question indicated that those who received visual annotations thought the program was easier than those who did not. Likewise those who received textual annotations indicated that the task was easier than those who did not. In fact, the textual-definitions treatment approached significance with a p value of .08, while the visual-annotations treatment had a much higher *p* value.

Interestingly, the visual-illustrations-only group rated the task more difficult than the other three groups. It may be that this group was frustrated by some of the images which did not offer clear definitions in and of themselves without understanding the context of the audio. One of the open-ended responses to the survey indicated this, stating that the image of grass (*hierba*) was unclear until she reached the quiz and saw that *tree*, which was on the edge of the visual illustration for *hierba*, was not one of the options.

Hard work. The cognitive load question asking students to rate how hard they worked addressed the *germane* dimension of cognitive load since it attempts to measure the amount of effort a student had to put into understanding the content. Results were not significant for this question either, but a trend can be seen in the data. Students who received textual definitions rated their work level lower than those who did not. Likewise, students who received visual illustrations indicated a lower level of hard work than those who did not. Students in the no-annotations group rated their work level the hardest and the both-annotations group rated their work level the lowest. This was again reflected in the attitude survey as students expressed greater satisfaction with the program in the both-annotations group. More students in the no-annotations group requested vocabulary annotations in their responses to open-ended survey questions.

Feeling of success. This is the only one of the five questions that resulted in significant differences for the visual and textual annotations treatments. It is also a question that may not clearly map directly to any one of the three types of cognitive load. Participants who received textual definitions for keywords felt more successful than those who did not. Likewise, participants who received visual illustrations for keywords felt more successful than those who did not. The no-annotations group felt the least successful and the both-annotations group felt the most successful. The open-ended survey responses reflect this attitude as well, with several students in the no-annotations group requesting more vocabulary aids and more participants in the other groups expressing satisfaction with the existing program.

Navigation effort. The navigation effort question addresses the *extrinsic* dimension of cognitive load. If a program is difficult to navigate, it can place extra, unnecessary cognitive load on students. There was no significant difference among treatments for this question. All groups rated their navigation effort very low for this program, scoring the question in the two-to-three range on the ten-point scale. Since variations of the program were almost identical in regards to navigation, the fact that there is no difference among the groups could have been expected. These results also indicate that the program was well designed and did not interfere with student learning.

Stress levels. Like navigation effort, stress levels were also rated low by all participants, around a three on the ten-point scale. The fact that students were not stressed may be due to the fact that this was a completely optional activity for them and was not a graded part of their regular class work. This result also indicates an effective activity for language learning. Krashen's monitor model of second language acquisition lists a low affective filter as a requirement for language acquisition (Gass & Selinker, 1994; Krashen, 1985; Lafford & Salaberry, 2003), meaning that students are able to intake more of the comprehensible input when they are not overly stressed about the learning task.

Student Attitudes

Some attitude data have been discussed in combination with the results above; however, the overall survey results are remarkable in and of themselves. Results indicate that students, regardless of their treatment group, felt the program was well designed, that it was relevant and interesting to them. Likewise, they rated the navigation and instructions very positively. There were no negative mean ratings on any of the survey items and only four of the 14 items were rated less than four points on a five-point scale. This indicates that the program was likely not a contributor to cognitive load and that any one of the treatments was likely beneficial to student learning.

Open-ended responses were also remarkable. When asked what they would like to improve in the program, students tended to ask for the other treatments that they didn't receive. Those in the no-annotations group wanted to see definitions and illustrations. Those who did not see illustrations wanted to see pictures. Those who did not see definitions asked to see them. Those students who saw both wanted to see more illustrations. This reflects some of the attitudes that Sakar and Ercetin (2005) found in their study. Students wanted to see the illustrations, whether or not they resulted beneficial to their comprehension.

Time-in-Program

The data and results of the time-in-program analysis reflected the fact that the participants were not in a controlled environment. Whereas previous studies were conducted in laboratory environments under relatively controlled conditions, this research study was done in a more realistic setting. Students who take language courses online have more control over when and how they study. The data reflect that students sometimes were stuck on one screen for a long time, perhaps due to the home or office environment in which they may have been studying.

Additionally, the results of time-in-program may indicate support for the effects of time-on-task. Students who received more annotations spent more time in the program. Those same students tended to perform better on the posttests. Students who were not able to access vocabulary annotations spent less time overall and probably less time focused on the content of the cultural aural text. However, the data are inconclusive in this regard. There were too few students and the data collected from the program logs were not complete or clear enough for a reliable analysis.

Future Research

This line of research into listening comprehension in multimedia activities has some promising directions for the future. The multimedia listening activity appeared to be well received by students and the treatments appeared to aid their Spanish listening comprehension and vocabulary learning. Activities such as the one designed for this study could become more common in fully online courses as well as in supplementary materials for more traditional course delivery.

Further research could expand into a number of issues related to the current study. The inconclusive vocabulary assessment results for this study may be explained by further research into assessment item types, similar to Jones (2004) research. Perhaps the findings would be different if the assessment item types matched the annotation treatment group for each student.

The cognitive load measurement is another area that could be investigated further. There are a number of physiological measures that could be investigated to determine if they measure load any more precisely than survey measures. For example, Antonenko, Niederhauser, and Thompson (2007) and Gevins et al. (1998) have done some research into using electroencephalogram (EEG) to measure cognitive load. Brünken, Plass, and Leutner (2003) also discuss a direct measure of cognitive load using a dual-task approach. Reliable and valid methods of measuring cognitive load will likely be the key to advancing this line of research into multimedia learning.

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Part II
Trends and Issues in Library and Information Science

Chapter 7
Introduction

Stephanie A. Jones

Ever since the widespread adoption of personal computers in the schools in the early 1990s, educators have been striving to find methods to successfully integrate technology into the curriculum. Today this goal has become even more crucial with the adoption of the Common Core Standards by the majority of the states (http://www.corestandards.org/). Technology is woven throughout the Standards and is viewed not as a separate skill, but as a learning tool through which to gain knowledge and skills in all the subject areas. The adoption of the Common Core Standards has also had an impact on the school library program (Gewertz, 2012). Many school librarians are responding positively by using their expertise with technology, the inquiry process, and a wide variety of texts to help other educators as they implement the Standards. The three chapters in this section inform this movement by providing insights on technology, leadership, and literacy. The first chapter in this section reports on a study of school librarians as technology leaders.

School librarians who serve as technology leaders in their schools can play a vital role in the successful integration of technology into the school curriculum. In order to understand the factors that make some librarians successful in this endeavor, Smith conducted a mixed methods study of 401 school librarians who said that were technology leaders in their schools. The results of the study showed that the presence of specific factors affected the school librarian's ability to effectively fulfill the technology leadership role. These factors included a supportive administration and faculty, the necessary technology infrastructure and hardware, flexible scheduling that permitted collaboration, and an adequate budget. As expected, the absence of these factors had a negative impact on the leadership role. Additional barriers

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included restrictive policies such as filtering and mandated standardized testing. Smith also investigated the various types of leadership behaviors of these school librarians. The study revealed that they were early adopters of technology and served as role models who promoted the use of new technologies by offering technology professional development to their fellow educators. A large majority of these school librarians also said they were role models for the ethical use of digital information and technology. Smith concludes the chapter with several recommendations intended to encourage other school librarians to adopt a greater leadership role. She recommends that they should become involved in school technology planning, serve as formal mentors, and offer professional development to teachers in the use of new technologies for instruction. Smith also suggests that school librarians offer technology workshops to parents, thereby giving them the skills they need to help their children by reinforcing the curriculum at home.

Educators understand that parents have an advantage when it comes to understanding young people today. However, in order to best serve our students we also need that knowledge, particularly when it comes to students' behaviors with new technology. The study described in the chapter by Kimmel, Dickinson, and Doll helps to deepen our understanding of how teens interact with media. Twenty-one students in a school library course were tasked with observing the literacy behaviors of teens as they socialized in a variety of public locations such as shopping centers, movie theaters, and coffee shops. The resulting snapshots revealed that teens are surrounded by many types of text ranging from books and magazines to signs and logos to digital media on cell phones. Moreover the teens in the study moved seamlessly through these various media, engaging one another through talk, text, gestures, and touch. This ability to read, write, and interact across a variety of platforms, tools, and media has been termed transliteracy (Newman, 2010). Although research on this type of literacy is still in the early stages, studies such as the one described in this chapter provide valuable information to educators who are seeking ways that schools can be transformed to take advantage of the ways that teens today communicate.

One way that educators have been able to engage students in their learning is through digital storytelling which allows students to express their personal narrative using digital media. Typically digital storytelling is done individually; however, with the recent interest in participatory culture (Jenkins, 2006) more collaborative processes are being explored. Rebmann's chapter, "A Collaborative Approach to Digital Storytelling Projects," is a fascinating examination of this new approach. Rebmann focuses on a single case at an after school program in which a group of adults, including afterschool program coordinators, researchers, and service learning students, worked with 6-year-old Rebekah in the creation and production of her digital storytelling project. Rebmann closely examines the processes involved in the creation of the digital story and concludes that the collaborative process presents a variety of learning opportunities not only for the young students, but for the college age students as well, while engaging, motivating, and challenging all of them. School librarians who are seeking learning solutions for meeting the Common Core State Standards may find inspiration in this chapter on collaborative digital storytelling.

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Chapter 8
From Theory to Practice: An Examination of How School Librarians Implement Technology in Schools

Daniella Smith

Introduction

Technology has been infused into the fabric of education in the United States. The current generation of k-12 learners has grown up with technology as an integral part of their lives, so instructors struggle to engage them with traditional forms of teaching, such as lectures, drills, and practice (Palfrey & Gasser, 2008). As a result, instructors are beginning to view technology as a means to improve student achievement (Holland, 2001; Project Tomorrow, 2011). As such, the National Education Technology Plan (United States Department of Education, 2010, p. 8) urgently calls upon educators to use technology to "create engaging, relevant, and personalized learning experiences for all learners."

Technology promises to be an effective tool for improving student achievement because it enables teachers to evolve from teacher-centered instructional strategies to student-centered constructivist activities (Matzen & Edmunds, 2007). It is important to note that a teacher is unlikely to develop student-centered constructivist activities without undergoing professional development that emphasizes these activities. Research indicates that the more time teachers spend on professional development in technology, the more capable they feel using technology in the classroom (National Center for Education Statistics, 2000).

School librarians can help to train teachers in educational technology. They are suitable for this role because the field of school librarianship is heavily ingrained in the use of technology as a foundation for teaching information literacy skills.

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Moreover, studies have shown that school librarians can be instrumental in assisting teachers with integrating technology (Branch-Mueller & de Groot, 2011; Dutt-Doner, Allen, & Corcoran, 2005). According to *Empowering Learners*: *Guidelines for School Library Media Programs*, school librarians should "contribute expertise on such issues as curriculum development, use of technology, equity of information access, intellectual freedom, and intellectual property rights, among others" (American Association of School Librarians, 2009, p. 47). Fulfilling this role includes, but is not limited to, becoming early adopters of educational and technology tools, being an integral part of school committees, collaborating with and training school faculty, and sharing expertise with school stakeholders. Overall, accomplishing the technology leadership role is imperative because "interactive technology has come to permeate every aspect of daily life; leading businesses and organizations have changed the way they work in order to thrive…SLMSs must lead this revolution to make room for new models of teaching, learning, and organization to prepare learners" (American Association of School Librarians, 2009, p. 46).

In accordance with this role, the work of a school librarian often goes beyond teaching students to accepting technology duties (Brewer & Milam, 2006; Farmer, 2012). For example, Dutt-Doner et al. (2005) found that when school librarians learned Web 2.0 tools and then shared their knowledge of the tools with teachers, the teachers began to request their assistance with learning how to incorporate the tools into their own lessons. Thus, Dutt-Doner and colleagues concluded that school librarians should establish an ongoing partnership with teachers who need to manage the complex nature of today's classroom environment. In addition, Dutt-Doner et al. (2005) and Branch-Mueller and de Groot (2011) observed that school librarians facilitated reform in their schools by assuming proactive roles in assisting students and staff to acquire information literacy skills. Without the regular support of school librarians, the teachers and students most likely would not have applied the information literacy skills that they learned.

Despite the proven value of the librarians' technology integration role, studies related to best practices and strategies for this leadership role are still uncommon. Nevertheless, Mardis and Dickinson (2009) found that "preservice SLMSs pointed to mastery of technology and associated troubleshooting skills as an essential part of their preparation." Schultz-Jones, Faber, and Reed (2010)) added that technology implementation and technology continuing education are among the top concerns of new school librarians and experienced school librarians. These findings indicate that preservice and practicing school librarians need research-based training to completely accomplish their technology integration leadership role.

This study focuses on school librarians in Texas who identified themselves as technology leaders. The purpose of this study was to explore the types of technology integration leadership behaviors these school librarians engage in and the factors that facilitate and inhibit these behaviors. The following research questions guided the analysis.

Research Questions

1. What types of technology leadership behaviors do school librarians engage in?
2. What factors positively impact the technology leadership behaviors of school librarians?
3. What factors negatively impact the technology leadership behaviors of school librarians?

Literature Review

Technology Integration Barriers

Technology integration continues to be a priority for schools in the United States because of the importance the government places on it (United States Department of Education, 2010). The National Education Technology Plan encourages teachers to use technology to cultivate learning environments that infuse technology-based assessments, administer data-driven decisions, and empower students with engaging personalized learning experiences (United States Department of Education, 2010). These recommendations address research indicating that the benefits of technology have not been fully realized in the educational system. For example, the results of a nationwide study conducted for the National Center for Education Statistics (Gray, Thomas, & Lewis, 2010, p. 3) states that, "Teachers reported that they or their students used computers in the classroom during instructional time often (40 %) or sometimes (29 %)." Still, only 42 % of the survey respondents on a survey for school districts agreed that technology funding was adequate (Gray & Lewis, 2009). In the same survey, 58 % of the respondents replied that classroom teachers are prepared to integrate technology into instruction. The remaining 42 % represent a significant amount of teachers responsible for preparing students for their future. This illustrates that while technology is available, it is not always an integral component of instruction.

There are multiple factors responsible for impeding the implementation of technology in school curriculums. It has been suggested that one of the factors that influences teachers' behaviors toward technology implementation is school culture (Demetriadis et al., 2003; Vannatta & Fordham, 2004). Schein (2004, p. 17) defines organizational cultures as "a pattern of shared basic assumptions that was learned by a group as it solved its problem of external adaptation and internal integration, that has worked well enough to be considered valid." Typically, each new person who works within an organization is indoctrinated into the organizational culture. To be considered a valid member, they must adapt to the cultural norms. Therefore, when teacher attitudes express a strong propensity for avoiding technology, it can be difficult to achieve reform (Demetriadis et al., 2003). In response, Zhao and Frank

(2003) suggest that when interviewing prospective teachers, it is important to consider their adaptability or willingness to accept technology.

Even teachers who enjoy using technology find that the rapid development of technology is another deterrent for implementation. Teachers must spend a considerable amount of time designing lessons for each form of technology (Bauer & Kenton, 2005). Once teachers are acclimated to using a particular technology in the classroom and have created applicable lessons, they may find that they are encouraged to use a new technology. The constant switching and the need to develop strategies to use each new innovation can be discouraging. Teachers who are unsure if a new technology is applicable to their subject area may decide to avoid it until it has been proven to be successful. One way to combat this reaction to new technology is to provide sustainable professional development that includes the practical application of technology (Flanagan & Jacobsen, 2003).

In addition to practical applications for new technology, teachers need time to experiment with new technology as well (Bauer & Kenton, 2005). Today instruction frequently focuses on high stakes testing. Therefore teachers may feel it is more important to concentrate on proven instructional practices rather than try new strategies that may have inconclusive results (Smith, 2010). This is unfortunate because numerous teachers are experiencing a disconnect with their students because they are unable to engage their students while using traditional means of teaching (Levin & Arafeh, 2002; Project Tomorrow, 2011).

While technology develops rapidly, it is not always accessible for schools (Bauer & Kenton, 2005; Ertmer, Addison, Lane, Ross, & Woods, 1999). For example, filtering or blocking Internet content can cause a lack of access when computers are otherwise available (Chmara, 2010). Bauer and Kenton (2005) acknowledge the value of the Internet for educational purposes. However, a concern about the availability of inappropriate materials on the Internet led the United States Congress to pass the Children's Internet Protection Act (CIPA) in 2000 (Federal Communications Commission, 2012). CIPA is designed to protect children from lewd and dangerous Internet content by imposing filtering regulations on schools and libraries. If schools and libraries do not adhere to the requirements of CIPA, they are not likely to receive discounts on Internet access from the government. As a result, teachers and students are frequently not able to access materials that have the potential to enhance the quality of education offered to students.

Another factor that leads to a lack of accessibility is poor funding for technology (Ritzhaupt, Hohlfeld, Barron, & Kemker, 2008). Teachers commonly find that there are not enough computers for their students (Bauer & Kenton, 2005). Moreover, there are times when the software and hardware that is available is outdated. The outdated software in turn leads to numerous technical difficulties that can actually decrease the effectiveness of instruction.

Equal access to technology is directly related to accessibility for students. According to Flanagan and Jacobsen (2003), schools must determine if female students are being encouraged to use technology just as much as males. Moreover, students with disabilities need technology that can differentiate lessons according to their needs (Michael, 1998). Finally, there is always the issue of the digital divide, which precludes students from lower income households from having equal access to technology (Project Tomorrow, 2011). These students frequently do not have the basic computer skills that are essential to completing assignments or access to computers at home (Project Tomorrow, 2011). A lack of access to computers at home forces these students to rely on computers at the school library or at the public library (Gordon, Gordon, Moore, & Heuertz, 2003). Both types of libraries have limited hours. Therefore, teachers may choose to avoid technology when their students cannot access it at home.

Technology Integration Enablers in Schools

While there are factors that impede technology integration, there are also factors that support it. For instance, school districts are aware of the need to build support systems or infrastructures to facilitate technology integration. One supportive action is to hire a district-level professional to provide leadership for technology integration. A study indicates the preponderance of school districts (84 %) that have a person who serves in a technology integration leadership role (Gray & Lewis, 2009). Furthermore in the same study, 95 % of school districts in the United States reported offering professional development for teachers to help them use technology for instruction.

Leadership within individual schools should reinforce leadership on the district level. In essence, school administrators should cultivate a shared vision for technology integration by implementing the actions described in a school technology plan. A collective vision and technology plan must incorporate all of the school stakeholders, such as the administrators, students, teachers, and parents (Baylor & Ritchie, 2002). It is beneficial for administrators to inform stakeholders about how technology aligns with the curriculum (Staples, Pugach, & Himes, 2005). This is important because the school administrator provides direct leadership, and his or her enthusiasm for technology can shape how stakeholders react to reform with regard to technology.

Another way to provide leadership in schools is to use teachers and technology professionals as catalysts for reform. Robust technical support is indispensible to making technology integration in the classroom systematic and it adds value to the curriculum (Liu & Szabo, 2009). Flanagan and Jacobsen (2003) note that technology thrives in schools when teachers have access to and regularly use technology to create engaging student-centered lessons. This creates an atmosphere where teachers are role models that provide examples of successful implementation. The teachers that are technology role models can be thought of as champions of innovation. It is possible for school administrators to develop champions of innovation through recruitment, coaching, mentorship, recognition of innovation, and giving teachers the chance to improve through trial and error (Howell, 2005).

While administrators can delegate some responsibilities to teachers or technical staff, it is important for them to oversee the technology integration process. School administrators complete leadership training before they assume their positions. However, teachers and technology staff complete training that is specific to their areas of expertise. Naturally, this training does not emphasize leadership; therefore, many teachers and technologists are not prepared for such responsibilities. Technical expertise does not transfer to administrative powers. Delegating administrative powers to people who are not equipped to fulfill them can lead to animosity and hamper efforts to integrate technology. With oversight, innovative teachers and technical personnel can be instrumental to achieving the goals of the school technology plan (Staples et al., 2005). Moreover, all school stakeholders should be part of the planning process in order to create an implementation model that fits the needs of all stakeholders (Liu & Szabo, 2009; Ramirez, 2011). Ritzhaupt et al. (2008, p.8) reported, "Misaligned technology plans might result in inappropriate spending (e.g., not purchasing all components necessary for successful implementation of technology or unfunded technology initiatives)."

The availability of professional development coincides with technology plans. Plans cannot be fulfilled if teachers have not been properly trained to use the technology that is included (Ertmer et al., 1999; Liu & Szabo, 2009; Michael, 1998). According to Flanagan and Jacobsen (2003), professional development is more effective when it is presented on a continuous basis and offers examples of how the technology can be implemented in the classroom. It is also advantageous to not require teachers to use technology in the classroom until they have received training. Another way to help teachers with varying levels of expertise is to allow them to request professional development that is personalized for their needs (Michael, 1998). Incentives like equipment and paid professional development can persuade teachers to attend in training opportunities (Liu & Szabo, 2009). In turn, teachers who attend professional development to learn new skills are more likely to be confident in their capacity to integrate technology into the school curriculum (Ertmer et al., 1999; Smith, 2010).

Methodology

Population

Invitations were emailed to 1,000 school librarians employed in Texas K-12 libraries. Data collection began in December 2011 and concluded in May 2012. A total of 401 respondents indicated that they were technology leaders within their schools. This analysis focuses on these participants who represented elementary (42 %), middle (26 %), and high school (21 %) librarians. The remaining participants (35 %) worked in libraries with combined grade levels. In addition, most of the respondents had master's degrees (85 %) and were female (95 %).

Data Collection and Analysis

The results reported for this study are a subset of the information collected for a larger study. The survey developed for the study was designed to collect demographic data and information about the technology integration leadership behaviors of the participants. The survey was pre-tested twice with school librarians to ensure it reflected the technology integration behaviors of school librarians. Suggestions were incorporated into the final version of the survey.

The survey questions discussed in this paper for Research Question 1 use the technology leadership behaviors described by the ISTE School Library Media Special Interest Group (2010) as a foundation for analysis. Research Questions 2 and 3 examine the factors that impede or assist school librarians in performing these activities. These activities are used as a framework because ISTE is a professional organization that specializes in incorporating educational technology in schools. The special interest group was formed specifically to address the school librarian's role in implementing technology. According to the group, school librarians are instrumental in infusing technology by performing several activities, including the following:

- Serving as information literacy and educational technology specialists.
- Helping students to become digital citizens.
- Collaborating with the school community to prepare students with twenty-first century skills.
- Providing professional development.
- Providing access to technology and educational resources in a variety of formats.
- Serving as a leader who helps to embed technology into the curriculum.

Qualtrics, an online survey software, was used to conduct this mixed methods study. A mixed methods design was implemented because there is little research to support the technology integration leadership role of school librarians (Smith, 2010). According to Creswell and Plano (2007, p. 12), "Mixed methods research helps answer questions that cannot be answered by quantitative or qualitative approaches alone." Therefore this design was appropriate for gaining a better understanding of the close-ended questions that were included in the survey.

When the data collection concluded, the Statistical Package for the Social Sciences (SPSS) was used for the quantitative analysis for Research Question 1. The software Nvivo was used to code the qualitative data obtained from the open-ended questions into themes to answer Research Questions 2 and 3. The findings of this report present frequencies for the statements related to technology integration leadership behaviors as well as the enablers and barriers that affect these behaviors.

Findings

Research Question 1: What Types of Technology Leadership Behaviors Do School Librarians Engage in?

The analysis of Research Question 1 revealed that school librarians participate in a variety of activities that provide a foundation for technology integration. These activities coincide with the technology leadership behaviors described by the ISTE

School Library Media Special Interest Group (2010). The results indicate that school librarians support technology integration by adopting technology, acting as role models, providing technology training, teaching digital citizenship, creating collaborative partnerships, and ensuring equitable access to materials.

Mentoring

The participants were asked if they mentor other educators. A majority (55 %) of the participants in this study did not mentor other educators. The low percentage of people indicating that they were mentors could be a result of school librarians leading by example instead of developing formal mentoring relationships. This is a characteristic that is emphasized in transformational leadership (Kousez & Posner, 2007). Mentoring is also a collaborative behavior that improves the professional practice of educators and enables them to teach new skills to students (Daresh, 2003).

The Adoption of Technology

The participants were asked if they were the first to try out new technologies in their schools. Most of the participants of this study were early adopters of technology. Eighty-two percent (82 %) agreed or strongly agreed that they tried new technologies before their peers. The remaining participants were neutral (14 %) or did not agree with the statement to some degree (4 %). This behavior coincides with the activity of serving as an information literacy and educational technology specialist. Trying new technology before peers signifies that the participants are champions of innovation that lead technology integration by serving as role models (Martinsons, 1993).

In addition to being champions of innovation, school librarians need to promote a shared vision of technology integration. Most of the self-identified technology leaders in this study work to promote a shared vision of technology integration in their schools. For example, 91 % selected that they always or frequently promote a shared vision. A small portion of the participants remarked that they rarely (7 %) do so or did not believe that it was their job (1 %) to promote a shared vision of technology integration.

Technology Training

The training of teachers and parents is an activity that reflects the school librarian's ability to serve as an information literacy and educational technology specialist. These are roles that are often assumed by school librarians (Brewer & Milam, 2006; Scholastic, 2008). Therefore the participants were asked how often they provided technology professional development to other educators. They were also asked if they provided technology workshops for parents.

A majority (63 %) of the respondents noted that they always or frequently provided professional development for other educators. There were other participants that provided professional development less frequently, with 31 % stating that they rarely provided professional development, and 2 % who said they never provided professional development. Finally, 5 % noted that it was not their job to provide professional development.

Another question asked if the participants offered technology workshops for parents. The participants were less likely to provide this type of training. A majority (75 %) stated that they never or rarely provide technology workshops for the parents. Another 15 % stated that it was not their job to do so. A few (8 %) of the participants stated they always or frequently provided the workshops. This reveals that school librarians do not address the technology integration needs of parents as part of the school community.

Digital Citizenship and Equitable Access

A question was included in the survey that asked the participants if they were role models for the responsible and ethical use of digital information and technology. Ninety-seven percent (97 %) of the participants selected that they always or frequently act as a role model. The remaining 3 % stated that they rarely engaged in this activity. This activity relates to acting as a leader who assists with embedding technology into the curriculum and helping students to become digital citizens.

Another component of teaching students to become digital citizens who use technology responsibly is to provide them with access to information. A question was included in the survey to inquire about if school librarians provide students with equitable access to appropriate digital tools and resources to meet the needs of students. When considering the equitable access to information, 86 % of the respondents stated that they frequently or always ensure equitable access. Nine percent (9 %) stated that they rarely do this, with 5 % stating that it is not their job.

Collaborative Partnerships

School librarians are expected to connect technology with learning objectives. Working as part of a team to learn about new technologies and utilize them reinforces this skill. The participants were asked if they are involved in learning communities to explore how technology can improve student learning. Most (78 %) of the participants in this study stated that they always or frequently participated in learning communities to learn how to improve student learning with technology. The remaining participants rarely (19 %) or never (2 %) participated in these learning communities.

In addition to the question about participating in learning communities, the survey inquired about the participants' involvement in the technology planning process. A majority (56 %) of the respondents were active participants in the planning process for integrating technology into the school curriculum. Thirty percent (30 %)

rarely participated, 7 % never participated, and 7 % noted that it was not their job to participate in such an activity.

Research Question 2: What Factors Positively Impact the Technology Leadership Behaviors of School Librarians?

Three hundred and fourteen respondents shared information about the factors that help them to implement technology in their schools. Fifteen themes emerged from the explanations. Figure 8.1 is an overview of these themes. The themes were as follows:

- Administration: refers to when school administrators act as leaders for technology integration by performing actions such as distributing leadership responsibilities, embracing technology, inspiring a common vision for integration, providing satisfactory staffing, and supporting the school community with adequate budgets.
- Infrastructure: the availability of buildings that are equipped for technology and cooperative personnel that are willing to support the technology integration role by offering timely installation, maintenance, and professional development.
- Personal motivation: exists when school librarians personally enjoy using technology, researching new technology, and using it to empower their school communities.
- Equipment: the availability of functional, up-to-date technology relevant to learning objectives.
- Professional development: sufficient access to relevant training that supports the school curriculum and specifies applicable lesson plans.
- Teacher attitudes: teachers that accept technology and are willing to apply it to their lessons.
- Collaboration: the availability of school community partners that co-teach, and share lessons and ideas that include technology.
- Time: a flexible schedule that allows the librarian to work with the school community in activities such as co-teaching and teaching information literacy skills to students.
- Budget: the existence of financial support for purchasing technology to reinforce the school curriculum.
- Stakeholder needs: a school librarian's willingness to engage in technology integration activities in order to support the educational requirements of the school community.
- Perceptions of the school librarian: the belief that the school librarian is an expert that can offer professional development and teach information literacy skills.
- Leadership role: the incorporation of the school librarian in leadership responsibilities such as planning the school curriculum and being the school technology administrator.

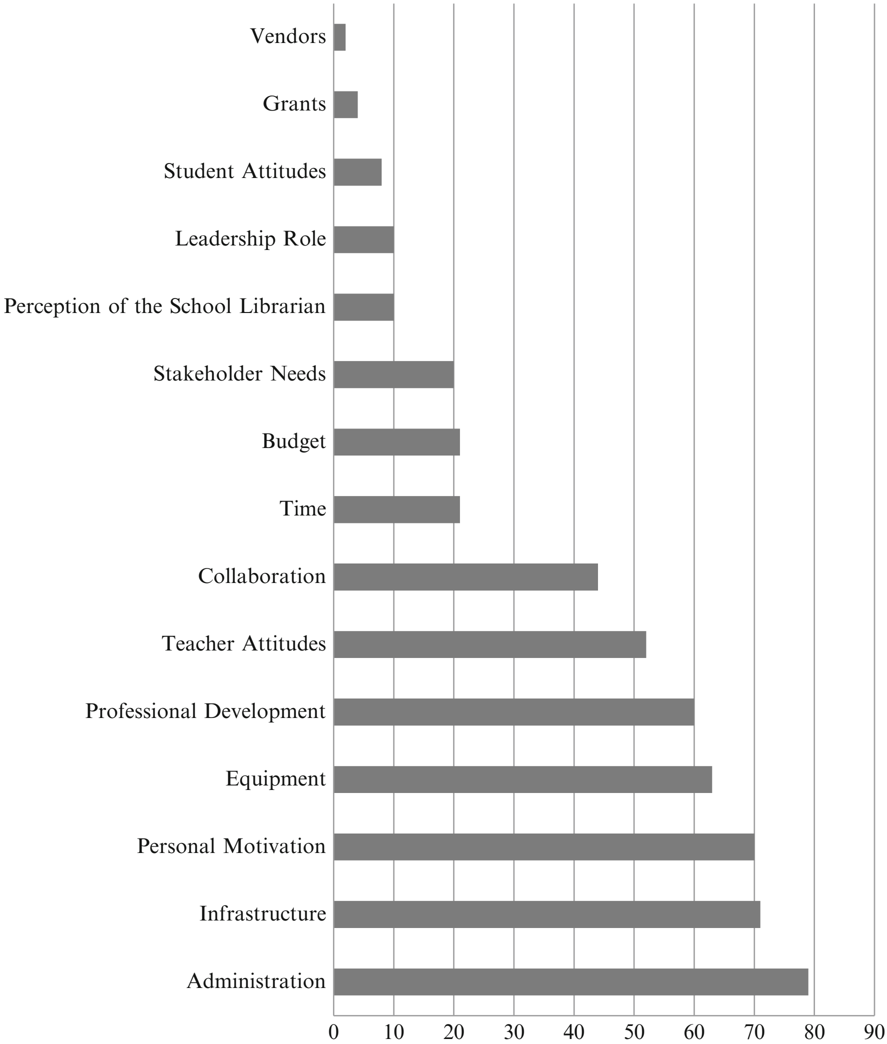

Fig. 8.1 The frequencies of technology integration enablers reported by the participants

- Student attitudes: the willingness of students to learn new technology for the completion of assignments.
- Grants: winning grants to purchase new technology and to provide training for staff members to employ the technology.
- Vendors: companies that work directly with school librarians to provide solutions that allow the librarians to purchase technology at an economical price or find grants to purchase needed technology.

Research Question 3: What Factors Negatively Impact the Technology Leadership Behaviors of School Librarians?

Three hundred and eighteen participants provided feedback regarding the barriers that impede their ability to implement technology. Eleven themes developed when the data was analyzed. Figure 8.2 provides an overview of themes. These themes are defined as follows:

- Budgets: a lack of funding to purchase technology.
- Time: inadequate time to experiment with technology, attend professional development, provide professional development, or collaborate with peers.
- Equipment: a deficiency of adequate technology to serve the needs of the school for reasons such as a high student to technology ratio or the use of technology that is outdated.
- Infrastructure: an insufficient foundation for technology integration that includes a lack of technology personnel to assist with implementation, uncooperative technology personnel, and outdated facilities.
- Teacher attitudes: teachers expressing a fear or aversion to utilizing technology.
- Policies: restrictive policies such as filtering that impede the ability of personnel to benefit from technology.
- Administrative support: district- and school-level administrators that do not provide a vision for the technology implementation process or do not support the school librarian's role as a component of technology integration.
- Standardized testing: testing that is mandated by the state to measure student achievement.
- Professional development: the lack of opportunities to learn about technology or training sessions that do not fully communicate how to incorporate the technology into lessons.
- Digital divide: students who do not have technology at home or students who do not understand how to use technology due to a lack of access to technology.
- Vendor policies: vendors that have restrictive policies that increase the cost of technologies or limit the use of technologies, such as eBooks.

Discussion

Teaching the Leadership Perspective

As school program administrators, it is important for school librarians to assume leadership roles. One of these roles is the technology leadership role (American Association of School Librarians, 2009). School librarians should be prepared to articulate how that role connects with their everyday practices as a program administrator. Many librarians may have difficulty visualizing how they can lead with technology and how

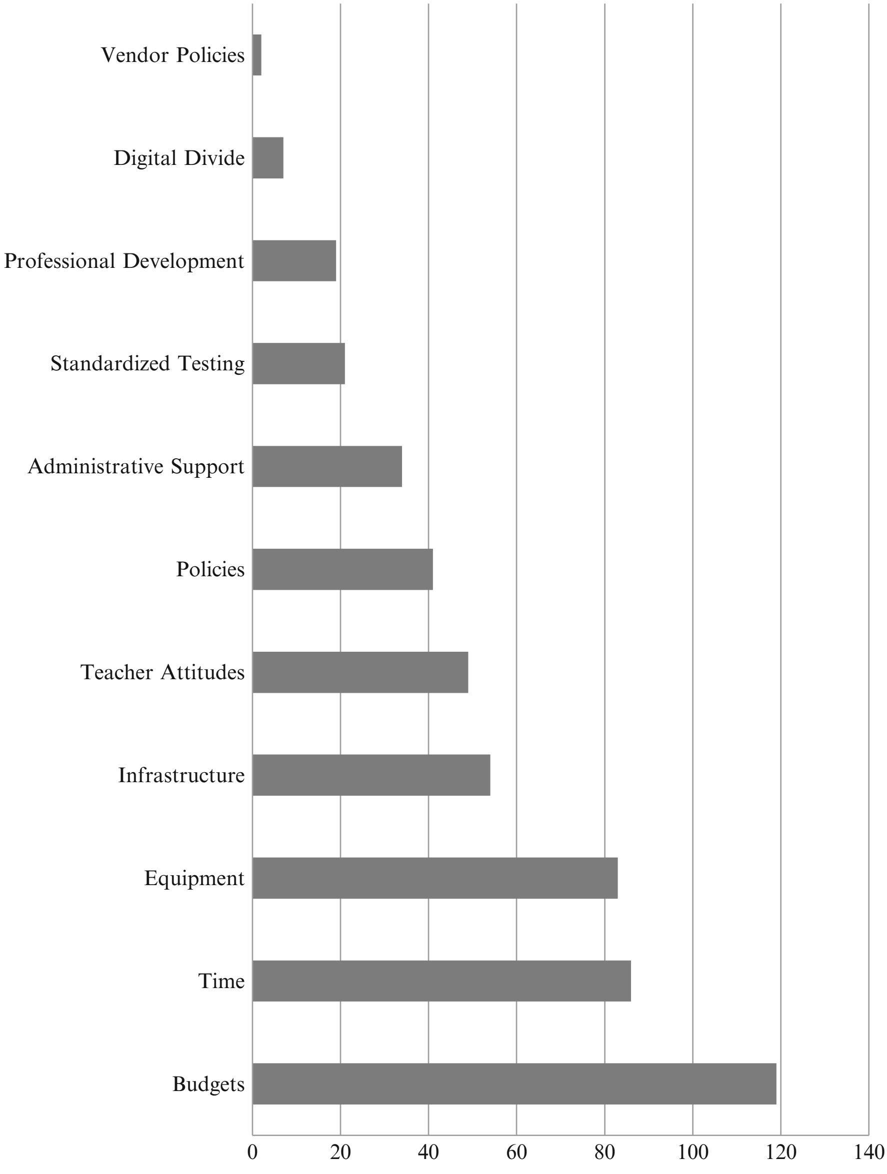

Fig. 8.2 The frequencies of technology integration barriers reported by the participants

feasible this role can be. It is a matter of teaching school librarians how to articulate the importance of the information literacy skills that they teach and the tools that they use to teach them. Everyone can embrace this role within the parameters of their own skill set. Leading is not a matter of knowing all of the details pertaining to a topic. Instead, it can be seen as the ability to look at one's personal strengths and sharing those strengths with other school community stakeholders who may not possess them (Kouzes & Posner, 2007). For example, if school librarians know how to use a Web 2.0 tool such as LiveBinders for digital curation and teach students and teachers how to use it, then they are engaging in the technology leadership role.

School Librarians as Mentors

The low percentage of librarians in this study that answered that they were mentors reveals that more school librarians need to become formal mentors within their schools. School librarians are frequently former classroom teachers (Everhart, 2002). As such, they can offer valuable perspectives and strategies for teaching that include experience from multiple viewpoints. Moreover, the barriers affirmed there is still a need for school librarians to assert their importance within schools (Hartzell, 2002). School librarians can reinforce their leadership roles by mentoring other teachers on how to use technology. Embracing this role can improve the perceptions of school librarians in schools and improve the quality of education that is offered to students.

The Fulfillment of the Technology Leadership Role

This paper offers a glimpse into how school librarians realize the technology leadership role. The results indicate that school librarians need to determine how this role may be fulfilled. While *Empowering Learners*: *Guidelines for School Library Media Programs* (American Association of School Librarians, 2009) indicates that school librarians should provide professional development, some still struggle with offering it as it pertains to technology. Part of the explanation for this could be that they rely heavily on technology personnel within schools to provide this guidance. However, one must note that most of the technology personnel within the schools have not been taught the nuances of teaching information literacy skills as school librarians have. School librarians are subject area specialists who need to assert the importance of the subject they are teaching. Yes, it is good to set parameters between the technology staff and school librarians. Still, both groups should consider forming partnerships that emphasize the use of technology tools to enhance the twenty-first century skills of students (Dutt-Doner et al., 2005).

The Stakeholder Disconnect

There may be a disconnect between school librarians and some of the stakeholders in their communities. For example, 84 % of the school librarians in this study were not fully participating in the technology planning process even though school library activities often rely on different forms of technology. School librarians that participate in the planning process can be aware of the changes that are going to impact them and influence decisions. However, those that do not share in the decision-making process may find that school libraries are not a priority and changes may negatively impact the services that they offer.

Moreover, the school librarians in this study were less likely to offer technology workshops for the parents. Providing such a program, even as little as once a year, would be beneficial to school librarians who want to take part in improving the entire school community. Offering workshops for parents would coincide with the suggestion that parents should be involved in the school technology plans (Baylor & Ritchie, 2002). In addition, school librarians can help to improve student achievement by teaching parents to reinforce the curriculum by using technology at home. Workshops for parents have the potential to place school librarians at the forefront of activities that mutually support technology integration and student achievement.

Technology Integration Enablers and Barriers

The technology enablers and barriers reported by the participants correspond to the educational technology issues listed by the ISTE School Library Media Special Interest Group (2010) in the group's description of the role of school librarians in promoting educational technology. An overwhelming response to the question regarding the factors that hinder the school librarians' ability to integrate technology was that the participants did not have enough money to purchase the technology that is crucial for teaching information literacy skills. Conversely, the participants noted that some of the free technology like Web 2.0 applications could not be utilized because of restrictive district policies that blocked tools. There were participants that felt that the lack of access to technology was detrimental to the academic success of students.

For example, a respondent contributed the following quote. "I feel that the state of Texas wants its students to be familiar with technology, but it doesn't want to spend the money to provide students access to technology. I work in a school where not all of our students have access to computers or the Internet at home. The only place they can play with technology, get their feet wet with it and ultimately become proficient with it, is to have access to it. That's just a fact, not rocket science. And they need someone like a well-trained librarian who can help them wade through the murky waters of the Internet and learn how to evaluate what they read. So, we need way more computers on campus to make that happen than we currently have."

The participants of this study were enthusiastic about their technology skills and their ability to contribute to student achievement. As such, a participant remarked, "Knowing how to use technology effectively allows me to demonstrate its potential to faculty. Also, working closely with teachers who are intrepid tech integrators acts as an advocacy tool for both tech integration and collaboration with me." Their enthusiasm often translates to technology leadership roles. With this in mind, another participant commented, "I like using technology and have a strong background so I automatically try to integrate technology into my teaching. I am the

Campus Technology Committee chairperson and this helps me stay abreast of what is happening on our campus in terms of technology."

On the contrary, there were other participants that were challenged by the perception of their roles. This quote illustrates this point.

> I would do so much more here, but we have an instructional technologist and every time I have tried to help or do something involving teachers or technology, I have been shot down. I am told that it is his job only. I know what my job should entail, but I don't have that support from the principal.

A supportive administrative environment that embraced the school librarian's role as a leader and collaborative partner was beneficial to the participants assuming a proactive role to incorporate technology. As an illustration, a participant wrote the following comment.

> My staff is progressive, open, and wants to learn. I have implemented a series of afternoon workshops called Technology Tuesdays. They are well attended. Collaborative lessons with all teachers on staff help me to integrate more technology. My library department supports me with training I can bring back to my campus and use!

These results coincide with research that asserts that technology flourishes in schools where teachers actively use technology and school administrators promote a shared vision (Flanagan & Jacobsen, 2003).

Conclusion

Technology is not a substitute for effective teaching. On the contrary, with appropriate training and a supportive culture, technology can enhance the quality of education for students. School librarians frequently use technology to teach information literacy skills. They also are in unique positions that require them to interact with entire school communities. Often school librarians are former classroom teachers that understand the nuances of creating engaging lessons for digital natives. This makes them exceptional candidates for serving in technology leadership roles. The results of this study indicate that many school librarians have embraced this role and thrive in environments where administrators acknowledge the value of the contributions that they can make to school communities.

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Chapter 9
The Cultural Commons of Teen Literacy

Sue C. Kimmel, Gail K. Dickinson, and Carol A. Doll

Today's teens are frequently referenced as "digital natives" (Prensky, 2001) and acknowledged as having been born into an electronic age where cell phones, social media, and unfiltered Internet access are everywhere—except in our schools. While we have placed an emphasis on identifying the skills we should teach them to become information literate (American Association of School Librarians, 2007), there is a gap in our understanding of what literacies teens already possess. In this study we take the position that teenagers and in particular, teen behaviors, might reveal emerging literacies that we would do well to acknowledge as we build connections with traditional literacies and information literacy instruction. Teen interests and teen behaviors might lead us to offer instruction and support that is relevant to this demographic as well as pointing us in directions for understanding the literacy landscape of the future as these teens move into our universities and workplaces.

In an extensive 3-year ethnographic study of teen media use, Ito et al. (2008) describe four key concepts that characterize their findings. The first is the way new and old media intertwine in a "new media ecology" in the everyday lives and practices of teenagers. Second, the researchers looked for learning in contexts they termed "peer-based learning" as teens interacted in out-of-school spaces including social media and third, they described "networked publics" as participation in public forums supported by mobile and Internet technologies. Finally, they identified a "new media literacy" defined by youth as they experiment with new technologies. In this study, we looked for evidence of these four concepts in teen behaviors in public spaces outside of school where teens were hanging out with each other.

Twenty-one students enrolled in a school library course were asked to unobtrusively observe teens in a public location outside of school such as a mall, a bookstore, or the swimming pool. Considering each of these spaces as a potential "media ecology,"

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we asked students to record any examples of literacy in the space including signage, flyers, displays, or particular ways that seating promoted conversations. Students noted characteristics of the teenagers themselves and what was communicated by logos on clothing, or particular choices in hairstyles, clothing, or accessories including the presence of any technologies from wristwatches to cell phones to laptop computers. Finally students observed how teens used these technologies in their interactions. Students collected data on an observation protocol and posted summaries of their findings for classmates to read and comment. The results of this assignment were 21 snapshots of teenage behaviors outside of school in various settings.

For this study, data was taken from the 21 "snapshots," and analyzed to look for patterns regarding teen behaviors in these "media ecologies" in order to explore the following questions:

In what kinds of places were teens hanging out and what types of messages were available in those spaces?
How did teens interact with each other, other people in the space, or the space itself?
What kinds of communication tools were observed?
What kinds of literacy/communication activities were teens engaged in?

Standards for the Twenty-First Century Learner

Our interest in teen literacies has been shaped by the Common Beliefs that frame the AASL *Standards for the Twenty First Century Learner* (2007) including that "learning has a social context," and "the definition of information literacy has become more complex as resources and technologies have changed." But of particular interest is the implied definition of reading in the belief that "Reading is a window to the world" which states that "The degree to which students can read and understand text in all formats (e.g., picture, video, print) and all contexts is a key indicator of success in school and in life" (AASL, 2007). "All formats" and "all contexts" implies a much broader definition of reading than we find in traditional print-based scenarios.

Transliteracy

Beyond literacy in multiple formats and contexts is the concept of transliteracy, or an ability to navigate across these multiple formats and contexts. It is generally considered that Liu, through the Transliteracies project at the University of California at Santa Barbara, is the first scholar actively engaging in transliteracy. Liu's work in this area, including his often-cited book, *The Laws of Cool* (Liu, 2004) can be seen as the precursor to other scholars' work in this area. Liu uses Bourdieu's concept of habitus to describe how information use and technology have created a new culture (Liu, 2004, p. 27). Liu describes this culture as a flat hierarchy, in which work gets done and knowledge is produced, but there is no discernible structure, rules, or even goals (pp. 43–44). Liu (2012) wrote that digital humanities had progressed from merely linking formats, information, and skills sets to a mature field that has articulated foundational concepts, enabling large-scale research projects (2012). Inspired by the work of Liu, Thomas and her team have worked to develop this definition of transliteracy as the "ability to read, write, and interact across a variety of platforms, tools and media from signing and orality through handwriting, print, tv, radio and film, to digital social networks" (Thomas et al., 2007).

Dunaway (2011) further articulated the definition by contrasting it with metaliteracy. She saw metaliteracy as both more theoretical and more of an overarching framework that focused on each format separately, including both the literacy within each format and also skill-related aspects such as information fluency. She saw transliteracy as almost a subset of metaliteracy, focusing on how users integrate the formats to access information. Her definition is "transliteracy, then, is the ability to derive meaning through the use of various media" (Dunaway, 2011, p. 679).

Some researchers are also suggesting a new instructional methodology as well. Both Dunaway (2011) and McBride (2011) noted that although constructivism was generally used in instructional transliteracy applications, connectivism is a stronger instructional framework. Ipri (2010) also attempted to operationalize the transliteracy definition, using a more social definition of "what it means to be literate in the twenty first century" (p. 532).

It is Asheim, however, who gave the field the theoretical framework for transliteracy research. Asheim's groundbreaking work on communication theory at the University of North Carolina at Chapel Hill focused on the interaction variables that comprise communication. Asheim (1987) addressed technology by noting that terms such as computer literacy or film literacy were becoming common, but that "the *ability to use and interpret the symbols* which transmit meaning is essential to the understanding of messages, however they are transmitted" (emphasis in original) (Asheim, 1987, p. 13). Asheim was also prescient on the user interaction with technology, and noted that the onus is on the library to construct messages in a way that will ensure that users will understand. The users, focused on the use of both technology and language, are doing their part by communicating to the library. The library has to be cognizant of the user and user behaviors to respond to user-generated messages in a way that they can be understood (p. 22). Asheim's comment that "the life of the mind is not tied—anymore, if it ever was—to a single channel of communication" (p. 20) is especially pertinent to transliteracy work.

Transliteracy research is still in its infancy, with few studies in print. Andretta (2009) established a benchmark for this research by interviewing four well-known information professionals. Only one was familiar with the term "transliteracy" although once provided with the definition, all agreed that the term was an accurate descriptor of their work.

Our research focused not on the variety of formats, but rather on understanding the settings in which today's youth functioned as transliterate information users. This positions our research not as focusing on the imagined divide of print versus digital but rather on how the users functioned in their own environment in what Thomas and her research team called the "unifying ecology" (Thomas et al., 2007) or Alvermann referred to as the "sieves" of the animated context of transliteracy (Alvermann & Moore, 2011, p. 158).

Youth

Young adult librarians are familiar with many of the norms of teenagers. They advocate "The trick, then, is to understand where we—and our teens—are coming from and, when we need to, change our own perceptions and expectations to best serve our teens" (Terrile & Echols, 2012, p. 19). Based on personal experience and efforts at self-education, it is possible for school librarians to understand adolescent needs, and design programs and facilities to help meet their needs. Observing teen behavior in locations where they voluntarily congregate is one way to begin to inform our own perceptions and expectations. As librarians, in the spirit of Asheim (1987), we seek to understand the teens that are our users and their ways of interacting with media.

Reading popular literature, headlines, and cartoons may indicate that today's youth never look up from their digital device, have their pants sagging, and never read unless forced to. A look at the statistics reveals a deeper story. Although more than 80 % of adult smokers began smoking before age 18, the number of teens smoking has declined sharply. In 1991, the Center for Disease Control reported that 30 % of teens have never smoked, while in 2009 that number is over 50 % (CDC, 2010). Nearly 45 % of teens aged 16–19 are employed at least part-time (United States Department of Labor, 2012). In one survey, only 22 % of teens aged 12–17 did NOT do any community service or volunteer work in the previous year (Data Resource Center for Child & Adolescent Health, 2012). So, teens are less self-centered and more grounded that common perception might imply.

At the same time, teens are certainly more "connected" than earlier generations. In July 2011, the Pew Research Center (2009–2011) reported that 77 % of all teens aged 12–17 own a cell phone, and 74 % own a desktop or laptop computer. In September 2009, they found that 79 % owned an iPod or MP3 player. In the past few years, that number has surely risen. Teen use of information appears informed, engaged, and complex. In this study, we sought to understand teen's information and communication behaviors in spaces where they hung out together outside of school and in what might be considered their "natural habitat."

Methodology

Data for this study was collected by preservice school librarians enrolled in a collection development/young adult resources class. The students in this course were provided with instruction and readings about selecting and evaluating materials for teens with a particular focus on teen literacy and media use. Early in the course, students are asked to complete an observation of teenagers outside of school in order to inform their work throughout the course.

> The purpose of this assignment is to think of teenagers as agents who engage in literacy activities constantly and to think broadly about the meaning of literacy for today's teens. Literacy is defined in the broadest sense to include any kinds of communication including but not limited to print, verbal, pictures, video, phones, signs, gestures, and clothing. While your observations will be limited to a single space, a brief period of time, and a few

Table 9.1 Locations for observing teens

Mall	8
Swimming pool	3
Bookstore	3
Yogurt or coffee shop	3
Carnival or festival	2
Movie theater	1
Community center	1

> teenagers, it is hoped that the conglomerate of observations from all classmates will provide an interesting snapshot of teen literacy. (LIBS 678 course documents)

In a discussion of ethnographic observations of a social situation, Spradley (1980) suggests that the observer looks at the place, actors, and activities. Following these guidelines, students were provided with a protocol to record their observations in a table with sections for each category. Students were instructed to choose a place where teenagers gathered such as the mall and unobtrusively observe them for at least 15–20 min, looking in particular for things about the place, the people, and their activities or interactions that related to literacy. For example, they were told to note what teenagers wore, including any words or symbols, and to pay attention to all kinds of communication activities including "talk, gestures, touch, sharing, reading, listening, and viewing."

Twenty-one students completed the assignment. The unobtrusive presence of these investigators allowed the teens to communicate normally. The distribution of their chosen locations is shown in Table 9.1. Most students filled up the observation protocol with observations. Several were quite detailed while others provided brief, bulleted lists. A limitation of this study is clearly the variety of students collecting data and their different interpretations of the assignment.

Because grades were assigned for this project, data from protocols were retained for analysis after course grades were posted. A graduate assistant initially handled the data removing any identifiers that would link observations to the students, the specific locations, or any specific people who were observed. A separate word document was created for each of the three categories: places, people, and activities. Data was then taken from each section of the protocol and randomly moved into the corresponding word document in order to further remove connections between observations and any individual identifying information. In this sense, the data also became a single case rather than 21 individual cases and the analysis focused on compiling a single "snapshot" of teen literacy behaviors. The analysis thus focused on patterns within and across the categories rather than the individual observations.

The three researchers individually read through the compiled data and then met to talk through the kinds of communication that were captured by the observations. Data was analyzed for kinds of "texts" and texts were defined broadly to include print, speech, dress, and gestures. A taxonomy soon emerged of kinds of media. Media is defined here in its broadest sense to include any "medium" used to convey a message (Table 9.2).

The latter category of technological media clearly overlaps with other categories in this taxonomy. The cell phone might be used to talk to someone else; the books and

Table 9.2 Taxonomy of texts

Printed texts	Signs, advertising, logos
Speech	Talking, shouting, speaking on a phone
Nonverbal	Gestures, touching, laughing, giggling, eye-rolling
Personal appearance	Clothing, shoes, hats
	Jewelry, makeup, tattoos
	Hair color, hairstyles
	Accessories: backpacks, skateboards
Technological media	Cell phones, laptops, audio devices, books, magazines, wrist watches

magazines are clearly kinds of printed texts, and the wrist watch may have been an item of jewelry. We chose to separate this category because of our interest in how teens were using emerging technologies such as the cell phone as well as their continued use of other more traditional technologies like printed books or wristwatches.

Findings

A Pew Internet survey found that "35 % of all teens socialize with others in person outside of school on a daily basis" (Lenhart, 2012, p. 16). Only 3 % of survey respondents indicated they interacted with others in person less than once a week, while 4 % indicated they never or cannot interact with people in person outside of school. Overall, the Pew report concluded that face-to-face interaction with their peers remains an important part of teenage life (Lenhart, 2012). Newman, Lohman, and Newman (2007) noted, "adolescents participate in a complex social environment populated by many friendship groups, cliques, and crowds" (p. 241).

In our study, the observations done by university students focused on teen behavior in public places and found behaviors that confirmed the Pew survey regarding face-to-face interactions. There are occasional mentions in our data of a teen being with a parent or a family group, a few couples, and three mentions of teens being alone. All other observations documented groups of teenagers interacting with each other, often noisily but without violence or rancor within the group. The teens observed were, for the most part, fully engaged with their peers.

Spaces and Their Messages

People who work with teenagers frequently observe teens interacting with each other, and our observers had no trouble finding places to watch teens interacting with each other—such as the mall or the swimming pool. The following were among the observations documenting teen interactions:

- A lot of loud, mundane conversations related to what they were seeing, what ride do go on, wardrobe issues, what was just texted by so and so.
- Reading signs and flyers, talking on the phone, talking and listening to their group of friends, stopping to talk to other teens they ran into while walking around, laughing, screaming to communicate that they were scared or excited while riding the rides, dancing to communicate they were having fun and enjoying the music…
- Girls were giggling and huddling together reading text messages.
- When they laughed, many times the boys would either like to hit one another or cover their mouths and throw their bodies back.
- The three girls were sitting at a high table talking and listening to each other nonstop.
- They would share their texts and then giggle immediately afterwards when talking on cell phone.
- The older group of teens were in the middle of the pool playing some type of water volleyball. They seemed oblivious that anyone else was in the pool or even existed. Lots of good natured teasing, and showing off…
- A teenager would say, "Oh guys! Look at this!" And then lots of laughing.
- When one group split up, they hugged each other during their goodbyes.
- The group of five boys who were cruising appeared to be having a great time. They were laughing, touching each other's arms as if to get each other's attention, and appeared to be enjoying themselves.
- Some eating, laughing, leading into one another, smiling.

Even a casual examination of the observations above indicates teen activities and attitudes predicted by research indicating that "most teens vastly prefer hanging out in person" (Marwick & boyd, 2012, p. 8).

The youth our participants observed were surrounded by text. In every setting, observers reported signs of one kind or another, including menu boards, fliers on tables, and advertisements on the walls from small posters to movie billboards. Food advertisements were on cups, napkins, and even condiment packets. Directional signs abounded at the pool settings, including posted rules, reminders of upcoming events, hours, and help wanted signs. In the mall settings, almost every flat space was reported covered with large graphic advertisements. Our observers, older than the teens, reported that "Trying to soak it all in while walking is difficult, but one sees constant signage offering a variety of goods and services" and "These are the vendors and each booth advertises its wares by signs, signs, and more signs." And yet teens seemed to prefer interacting with other teens to reading signs. As one observer noted, "when they had a question about ticket prices or rides, they would voice it before simply looking at the gate that explained the information." It was almost like "I am trying to include you so I will ask this question that I could easy answer myself if I just looked up."

Interactions

Most observations were of teens with a full range of mixed gender and single gender pairs or groups. Interactions with the opposite sex ranged from pretending not to notice each other to obvious flirtations. Boys were showing off, ostensibly for each other at the swimming pool, but a group of girls were clearly watching and giggling. One couple was observed at the mall, playfully looking at each other through the handles of a Victoria's Secret shopping bag and then stealing a kiss. Occasionally teens were with a parent and the interactions ranged from clear avoidance, boredom, and eye-rolling to animated sharing of feelings. In the bookstore, some parents were observed taking an interest in their teen's reading selections.

The interactions were also physical:

"Girls were giggling and huddling together reading text messages."
"When they laughed, many times the boys would either like to hit one another or cover their mouths and throw their bodies back."
"When one group split up, they hugged each other."

Teens were physical with each other and often touching. Males were observed wrestling playfully in the swimming pool, giving a playful shove, or "fist-bumping" as a greeting. Teens gestured dramatically and even danced to communicate. Teens were in constant motion; one group of boys was observed cruising past the observer four or five times. Another group of boys stayed within a small area but moved in a circle. Teens clearly filled the spaces, moving seats outward in the food court, and carrying on loud conversations.

Although it can be expected that the teens chose each other's company, and therefore were predisposed to get along, there were still indications that the teens took care of the feelings of others, provided nonverbal active listening cues, and cheered each other on. While there was teasing and playful imitation observed, it was always qualified as "good-natured." A teenager would say, "Oh guys! Look at this!" "And then lots of laughing." Laughter abounded. Profanity was only noted once, and one other time the words "stupid" and "shut up" were overheard. Exact conversations were not captured but pieces of conversations included clothing, hair, boys, college majors, ringtones, Youtube, what was just texted, and even several booktalks in one bookstore. Spanish was overheard in one observation. And as one observer emphatically stated, "They changed the subject often!"

They changed the subject often but they also navigated across platforms easily from cell phone screen to in-person conversation, from book to booktalk, and from a movie to a t-shirt. Teens are notorious for their concern with appearance. Several of the overheard conversations in these observations were about clothing or appearance. As one teen protested in an attempt to distance herself from an unknown other, "I am not acting like her. I don't look like her!" As teens selected clothing, hairstyles, body piercings, and tattoos, they marked themselves as members (or not) of particular groups. Among the interesting findings in these observations was the proliferation of written or symbolic messages associated with product marketing across these choices. This kind of media saturation that translates across platforms from movies, t-shirts, books, and rubber bracelets is a marketer's dream.

The purpose of this inquiry was to consider what messages were conveyed by the clothing, hair styles, and accessories they wore. Among the interesting findings were the proliferation of written or symbolic messages associated with product marketing across teen's dress choices, the messages teens conveyed about themselves as both members of particular groups and as unique individuals, and the ways that clothing and accessories suggested a kind of transmedia literacy.

Communication Tools

Product marketing on teen clothing is much more than a label on jeans or a logo on a pair of shoes. These labels were clearly evident in almost all observations and on even the smallest bikinis. As one observer remarked about a store in the mall, almost every item of clothing in the store bore the name of the store. The names and logos of well-known brands, sports teams, popular movies, and even universities were splashed across t-shirts and ball caps and observable across the mall or swimming pool. Teens carried brand name accessories such as Nerf footballs, IPods, and pocketbooks. One observer estimated that as much as 90 % of what teens were wearing had words or images on them and from the reports of observers, these were primarily associated with major brands. Two teens stood out in separate observations with counter-messages on their t-shirts: "Dork" and "Geek is the New Cool."

The fact that many of the same brand names appeared time and time again in different observations suggests that teens may be buying and wearing these brand names as a way of proclaiming their identity with each other and as consumers. The observations of teen clothing styles suggested that teens often dressed to look like each other. As one observer remarked, "It's as if the girls called each other to coordinate outfits before they met." Teens seemed to dress like others of their gender. Many observations began "Most of the girls….," or, "Almost all of the boys…" For example, "He was wearing the typical outfit which consists of a t-shirt and board shorts, and he was wearing a white baseball cap (turned backwards)" and about the females: "Most of the young ladies also were wearing t-shirts and shorts but their shorts were much shorter, and they wore flip flops." Body piercings were not limited to pierced earrings and included lip rings and larger gauges. Tattoos were often observed particularly on older teenagers. During the summer of these observations, rubber bracelets were popular and included slogans and brand names. Apparently one yogurt shop had a promotion that offered a discount to anyone wearing one of their bracelets. In fact, the rare teen spotted who was not wearing clothing that obviously supported a logo was noticeable by its absence. One participant noted "He was probably the most 'unfashionable' in the teenage circle," while the description of what he was wearing was notable only for the lack of logos "plain white t-shirt and jean shorts."

Body piercings, and tattoos along with some interesting hair colors were among the ways teens marked themselves as unique yet clearly members of a youth culture. Some teen descriptions particularly stood out as examples of young people creating a unique identity and marking themselves as individuals through their unusual clothing choices. Take the following examples.

"Another teen who caught my eye was a young lady with black hair (appeared to be dyed), red shirt, blue jean shorts, and mismatched Converse sneakers—one was black and another was white. She really wasn't dressed as a Goth, I think it was just her own style."

"The white girl had short brown hair and little journalist type glasses on. She was wearing black boots to her knees and had a fur coat on. She was showing a lot of skin between her coat and boots. She had heavy eye liner on and played a lot with her hair."

"He had on a white Fedora hat with a black feather sticking out of it, a bright yellow Spongebob t-shirt, and light Levis. His shoes looked like they were penny loafers."

The cell phone was a ubiquitous accessory seen in almost every teen's hand or pocket. All of the technology observed for this study was personal and mobile. Some teens wore headphones and listened to IPods. A few large sports watches were seen mostly on teen males. A couple of laptops were seen in one location. Books, magazines, newspapers, and flyers were noted in some observations. The cell phone was everywhere but it was not often used as a phone. As one observer noted, "It was weird at first for me to notice that I was not hearing a lot of talking, but it became clear as to why: all their talking is being texted." We note that the composing and reading of texts indicate that teens *are* engaged in reading and writing, though we rarely recognize it as such. In addition to texts, teens used their phones to check the time, take and view photos, take and view videos, surf the Internet, and collect phone numbers for members of the opposite sex. While teens would text, talk, and walk at the same time, it was interesting that in one group, teens walked away to take phone calls in private.

Literacy/Communication Activities

With powerful mobile technologies constantly at hand, teens are clearly poised to engage in transliteracy activities, or to smoothly move from one format to another. This was observed as teens practiced dives at the swimming pool and then jumped out of the pool to look at the video of their performance. In fact, teens were frequently observed sharing the screens of their cell phones with friends. Again the sharing of texts, photos, and videos as a subject of on the spot conversation appears as a crossing of platforms from digital to in-person communication. While teens were also observed "alone together" (Turkle, 2011) as they sat near each other but attended exclusively to their screens, the opposite was more frequent: teens shared screens with their in-person companions.

The most pervasive kind of transliteracy observed was of large consumer brands including sports franchises. Teens were essentially walking advertisements for these products not only because they wore them, but because they prominently displayed their brand names or recognizable logos. Teens moved in and out of these brand-named stores in the mall. Advertisers clearly understand how to market products across platforms from magazine ads to store displays to teen clothing and identity. Batman, SpongeBob, Twilight, and Harry Potter were among the observed "brands" with huge media formats behind them including best-selling books, box-office hits, and television shows. "To gain status in any group, members must conform to its norms" (Milner, 2006, p. 242). Styles of dress, styles of speaking, and other rituals are examples of some of the norms of teenage groups. The observed youth were walking billboards, with almost every observer reporting company logos on shirts, shoes, clothes, or even beach towels.

Conclusions

In the 1996 Epilogue to her landmark, *Ways with Words,* Heath (1996) notes that the type of field work that made her ethnography possible is now impossible because today's children do not have the same boundaries that their parents did where young and old engaged in daily work and conversation together. Instead she notes, "Commitment to or sustained face-to-face interaction with speakers across ages has been reshaped by youth culture's attention to the need to stand apart from adults and to self-identify as youth and thus to self-define by peer affiliations and commercial norms of fashion" (p. 374). Clearly these observations of teens today supports this kind of youth culture clearly connected with major commercial brands and consumerism. But Heath goes on to note "Yet for all students and teachers, classrooms today provide a major place where sustained communication between older and younger people in the joint production of work can take place" (p. 375–376). Heath's purpose in her work, now several decades old, was to bridge the language practices of children outside of school (in homes) with that inside school. In an interview, Alvermann contests this in and out of school divide. Instead she suggests that we look for ways that the literacies in both spaces are qualitatively similar and use teen's literacy behaviors outside of school to inform our work in schools (Alvermann & Moore, 2011). School continues to be one of the few places where young people have sustained contact with adults. Rather than ignore, or prohibit, the kinds of communication youth engage in outside of school, how might we harness those means to promote critical thinking, creative media productions, and strong personal and social identities?

In this study we noticed teens in information-rich environments surrounded and clothed in texts. Reading and writing were observed everywhere but especially through cell phone texting. Teen behaviors were overwhelmingly social. While a few used their cell phones to tune out, the majority were using their cell phones to engage with others, to create and share media, and to stay in touch. Jenkins, Clinton, Purushotma, Robison, and Weigel (2006) have described these sorts of behaviors as a "participatory culture." The skills needed for this participatory culture are not individual but social; they require a community. These teens were in public spaces in our communities. Overall their behavior was playful, yet thoughtful. While we began by wondering how schools might embrace the existing literacies of teens in our classrooms and libraries, we would like to close by asking how communities might embrace our schools and the futures of the teens that attend them. Related to teens hanging out, messing around, and geeking out, Ito et al. (2008) ask:

> Rather than thinking of public education as a burden that schools must shoulder on their own, what would it mean to think of public education as responsibility of a more distributed network of people and institutions? And rather than assuming that education is primarily about preparing for jobs and careers, what would it mean to think of education as a process of guiding kids' participation in public life more generally, a public life that includes social, recreational, and civic engagement? And finally, what would it mean to enlist help in this endeavor from an engaged and diverse set of publics that are broader than what we traditionally think of as educational and civic institutions? In addition to publics that are dominated by adult interests, these publics should include those that are relevant and accessible to kids now, where they can find role models, recognition, friends, and collaborators who are co-participants in the journey of growing up in a digital age. (p. 39).

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Chapter 10
A Collaborative Approach to Digital Storytelling Projects

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Digital storytelling (DS) represents a set of digital media practices focused on the production of technology-mediated personal narratives. The Center for Digital Storytelling was founded in 1994 by several pioneers in the field, Joe Lambert, Dana Atchley, and Nina Mullen. DS activities have enjoyed great enthusiasm and adoption in classrooms, libraries, and out-of-school contexts where technology-rich activities have become increasingly relevant (Robin, 2008; Thompson, 2005). By stretching students creatively and exposing them to diverse forms of literacy in multiple modalities, DS responds to the need for activities that are simultaneously engaging for students and intellectually rich. For example, DS projects integrate twenty-first century literacies into curricula in ways that are responsive to students' diverse backgrounds and learning styles (Crane, 2008; Fredricks, 2009). DS projects also respond directly to standards articulated by the American Association of School Librarians (AASL, 2007), the International Society for Technology in Education (ISTE, 2007), and multiliteracies pedagogical frameworks (New London Group, 1996). Digital storytelling can be found across the curriculum, including language arts (Sylvester and Greenidge, 2009), art and social studies (Borneman & Gibson, 2011; Greenhut & Jones, 2010; Hutcheson, 2008), and math and science (Gould & Schmidt, 2010; Thompson, 2005; Ware & Warschauer, 2005). In afterschool contexts, Hull and Katz' work in the DUSTY afterschool program (2006), as well as Davis (2004) and DeGennaro (2008) discuss the role DS can play in children's articulation of *individual* identity.

Although digital storytelling came to (classroom and library) prominence toward the end of the 1990s, interest in these activities persists across the curriculum, albeit with a different set of tools and in more dynamic configurations (Rebmann, 2012).

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PhotoStory, MovieMaker, and iMovie were used widely as tools for building first generation digital stories (Rule, 2010). More recently, Web 2.0, marked by the infusion of web contexts with semantic and interactive functionalities (including folksonomies, web-based metadata, and social networking), has revolutionized the ways in which digital stories are constructed. The use of Web 2.0 technologies, such as synchronous messaging, streaming media, blogs and wikis, social networks, tagging practices, RSS feeds, and mash-ups to develop multimodal services and resources for users, is sometimes referred to as "Library 2.0" (Maness, 2006). The emergence of Web/Library 2.0 technologies has changed the terms for digital storytelling design and production by making digital story production more accessible. Librarians, educators, learning designers, and programming coordinators now have access to an abundance of freely available software and venues for developing and sharing productions.

Alexander and Levine (2008) suggest that Web 2.0 not only changed the terms of DS production, but makes possible a new richness based upon how the technologies can be in conversation with each other. Alan Levine's wiki site, *50+ Web 2.0 Ways to Tell a Story* (http://50ways.wikispaces.com/) discusses how one might initiate a Library 2.0 digital story. VoiceThread (http://voicethread.com/), a slideshow-based program and Kerpoof (http://www.kerpoof.com/), an animated video tool aimed at schoolchildren are but two of more than 50 applications that are both discussed and reviewed on Levine's site. Levine showcases a video of his own creation, http://www.youtube.com/watch?v=kDYJAZiskRw that highlights the application of multiple Web 2.0 tools and production strategies for DS.

While Web/Library 2.0 technologies represent much of what is new in the field of digital storytelling, it should be noted that new configurations in the production of digital stories are emerging as well. Collaborative digital storytelling, a set of practices involving multiple authors working jointly on building narratives, represents one new line. In this work, focus is placed on studying collaborative practices, particularly between adults and youth with the goal of understanding and improving learning processes. Hayes and Matusov (2005) explore collaborative authorship in their study of DS intervention design, arguing that joint authoring between youth and adult authors supports learning and development. In this work, the focus is on making visible the powerful comingling of multi-generational forms of expertise and perspectives in collaborative DS. Davis (2004) also describes spaces where youths and adults learn from each other as they engage in DS practices.

> The adult's contribution reflected a preference for a particular normative genre of story--chronological linking of events in a causal sequence to describe and explain a change that had some emotional significance for the teller. The youth certainly were practiced in producing informal narratives of this general pattern for themselves and for their friends, but probably had little experience in formalizing such a telling and reflecting on it. The stories emerged gradually through interaction with the adult from a simple theme or event (airplanes, birthday parties, coming to America) into a more reflective interpretation of a sequence of related events (p. 16).

Importantly, Davis argues that meaning-making is enhanced when lifeworlds interact via joint imagining and digital production.

Research Questions

The study reported on here differed from Davis' study by endeavoring to focus on the collaborative processes of digital storytelling projects.

In this context, *joint* authoring and production of digital stories, resulted in a complex set of groups that were connected to the digital story and its development. This contrast informs the core research questions of this chapter:

- How will digital stories emerge in a collaborative context where creative, technology-mediated narratives are jointly produced?
- Via what practices and process will DS collaborators interact?
- How might a collaborative structure impact opportunities for learning?

The remainder of this chapter will analyze one case of a collaboratively produced digital story. While there are limits in this approach, one case will be analyzed with the goal of opening a contextualized dialog about collaborative digital stories, in an effort to begin answering those questions posed above.

Research Strategy

In the case highlighted here, a digital storytelling project emerged and evolved to meet the goals for activity held by four distinct groups of afterschool participants: children, undergraduate service-learning students, afterschool programming coordinators, and researchers. The study takes an ethnographic approach to studying the artifacts and collaborative digital storytelling activities associated with the Fifth Dimension Project (5D), an afterschool program begun by Michael Cole and Peg Griffin in 1987. Representing a university–community collaboration, the 5D placed undergraduate students from the fields of Psychology, Communication, and Human Development in an afterschool program where they worked as field ethnographers conducting qualitative research while they engaged in homework help and educative play activities with K-6 child participants.

This chapter reports on the highly collaborative Digital Storytelling (DS) activities that emerged in the Fifth Dimension where child participants, afterschool program coordinators, researchers, and service learning students worked together. By creating an artifact where goals for play and particularized/formalized content were co-constituted, the digital stories provided service learning students, researchers, and afterschool programming coordinators with an object of both analysis and intervention to support learning on behalf of child participants and their service learning partners. Research presented here contributes to the emerging literature concerning the integration of new information and communication technology (ICT) and the design of programming to support multiliteracies in educational and out-of-school contexts such as libraries and other afterschool settings.

The digital storytelling projects in the 5D were activities mediated by specially designed artifacts and guided by adult brokers (afterschool program coordinators, researchers, and service learning students). In this way, collaboratively produced digital stories were designed to meet the goals of the diverse groups of adults and child participants and supported children's engagement in new practices associated with reading, writing, developing narratives, and producing a multimedia production project. Along similar lines, service learning students benefitted from the opportunity to learn and reinterpret ideas when concepts associated with coursework moved from theory into practice. This chapter highlights the experiences of Rebekah, her peers, and the adults that worked with them to make visible the ways in which digital storytelling is particularly relevant when it involves joint pretense and collective imagining.

Ethnographic Observations

Adult, undergraduate participants recorded much of the activity as it enfolded in ethnographic fieldnotes. Between 15 and 20 undergraduates attended the Fifth Dimension two times a week and authored fieldnotes detailing their participation and interactions during the fall of 2004. Educative play activities taking place at the sites included participation in (a) multimedia production projects, (b) art projects, (c) board games, (d) console and pc-based video gaming, (e) web-based information seeking, and (f) web design. Hundreds of fieldnotes were collected during the semester of interest. A small subset of six fieldnotes detailed Rebekah's case, allowing the author to chart and characterize participation in various activities through observations made by adult, undergraduate participants (service learning students) working in the Fifth Dimension. Although the dataset is several years old and has been analyzed for its value as a record of technology-mediated programming in out-of-school contexts, these data were never explored as evidence for understanding processes of collaborative digital storytelling. This chapter represents one attempt to address these issues.

Questionnaires and Interviews

Prior to participation in the Fifth Dimension sites, children completed a questionnaire in which they provided biographical information (e.g., name, age, gender, favorite movies/activities). Children and Afterschool Program Coordinators were also interviewed periodically concerning their activities and production projects.

Findings

The Fifth Dimension provided a rich source of ethnographic observations, child questionnaires, and examples of designworks to communicate ideas over relatively long timeframes. The research design allowed for analysis via triangulation between

Table 10.1 Case summary

Digital story title	"The Secret Service"
Participants	• Children: Rebekah (6 years old) and Mischa (around 8 years old) • Undergraduate Service Learning Students: Betty, Harmony, and Bethany • Afterschool Program Coordinator: John • Researchers: Sonja, Mike, and Kristen
Digital story synopsis	Betty recounts Rebekah's story in one of her fieldnotes: "Sarah and Zoe are really rich, and they decide to go downstairs to watch TV in their movie theater. But they couldn't find it, and they figured out someone stole it. They wanted to call the Secret Service, but first they went to the Boys and Girls Club and asked John. John couldn't find it, so they called the Secret Service. They found the robber, and he was watching TV on their TV on the couch. The robber went to jail. And Helen and Zoe gave the Secret Service presents." [BW: 10/26/04]
Key points	• Incorporates aspects of Rebekah's personal biography • Video was used to capture footage which was edited by undergraduate service learning students

data collected from observations of children inscribed in fieldnotes, statements children made about themselves in applications and interviews, and designworks created by children as part of their participation in digital storytelling. Three questions were posed in attempts to understand practices and processes of collaborative digital storytelling.

How Will Digital Stories Emerge in a Collaborative Context Where Creative, Technology-Mediated Narratives Are Jointly Produced?

Although not influenced directly by the work of Kajder, Bull, and Albaugh (2005), the digital storytelling projects in the Fifth Dimension proceeded along similar lines to their seven-step approach to constructing digital stories. The undergraduate service learning students added an additional step at the beginning by developing an instructional session to teach the children principles of basic video production.

> We had about 10 kids and that was okay for us but we were hoping for more. We went into the equipment room with these children for there was a white board in there and we were able to separate from the other children… [BDW: 10/21/04]

By the end of the quarter, the students were able to build upon this small group of participants, and had managed to get many of these children involved in several digital storytelling projects. This study focuses on the experiences of Rebekah, her peers, and the adults that collaborated with them. See Table 10.1 for a case summary.

Undergraduate service learning students worked to broker participation by the child participants in developing narratives which could then be translated into written or illustrated storyboards. The idea of brokering (coming out of Wenger, 1998) was important here because it captures the type of goal-oriented activity that the Fifth Dimension researchers wanted undergraduates, scholars, and community workers to engage in.

Three service learning students, Betty, Harmony, and Bethany, brokered an interaction with 6-year-old Rebekah to create a movie about the Secret Service. Rebekah had apparently been observing Harmony, Betty, and Bethany's interactions with another child and attended the movie-making instructional meeting and indicated her interest in developing a digital story.

> …she started telling me her story. This is what she said: "Sarah and Zoe are really rich, and they decide to go downstairs to watch TV in their movie theater. But they couldn't find it, and they figured out someone stole it. They wanted to call the Secret Service, but first they went to the Boys and Girls Club and asked John [an afterschool program coordinator]. John couldn't find it, so they called the Secret Service. They found the robber, and he was watching TV on their TV on the couch. The robber went to jail. And Helen and Zoe gave the Secret Service presents." [BW: 10/26/04]

The service learning students then worked with Rebekah on a storyboard to illustrate her ideas. The highly collaborative effort scaffolded Rebekah's articulation of the story while exposing her to new concepts associated with planning a digital story.

> The next step was to create a story board out of it so that we would know how to film our shots and scenes. Rebekah eagerly ran to get a piece of construction paper and a huge basket of crayons. I drew three big boxes with lines adjacent to them on each side of the paper, setting up for a six scene storyboard. Rebekah drew the pictures in the boxes as she sees her movie unfolding. Harmony and I sat next to her and dictated each scene of her story back to her so she could draw it. We would invariably ask her questions about what was being portrayed in her drawings, and she would explain in great detail which character was which, who was who, and what they are doing in each particular scene. [BW: 10/24/04]

When Rebekah began to add characters and indicated that she wanted real people to act out the story rather than making a movie with pictures and narration, it became apparent that the reasons for her participation were varied. Rebekah indicated that she wanted people to act out the story rather than making a movie with pictures and narration, as is usually the case with digital storytelling. In this way, the resulting digital story had elements of digital video as well—particularly the fusion of fictional narrative with personal narrative (an interesting combination).

Via What Practices and Process Will DS Collaborators Interact?

Although the organizing storyline originated with Rebekah, the process of storyboarding, filming, and performance involved the coordination of service learning students, afterschool program coordinators, and researchers. Collaboration also occurred at the levels of learning design (the process by which digital storytelling was infused in the programming of the Fifth Dimension). Design processes involved joint planning and articulation tasks performed by researchers and afterschool program coordinators working together. The digital story recounted here had the permanence and robust attributes that allowed it to be planned and executed across many different contexts without losing its defining structure. Interestingly, that defining structure wasn't lost as it was modified, imagined, and reimagined in interaction with the diverse groups of the Fifth Dimension. Each group had its own characteristics and goals for participation. With these ideas in mind, it makes sense to explicitly describe the groups that worked together in the Fifth Dimension. Where did their realms of expertise begin and end? What did the different groups have to offer each other? What were the implications of this complex social milieu?

The Fifth Dimension was populated by a diverse set of groups with a varying array of expertise in the realms of basic literacies, new ICT literacies, creative practices, and popular cultures. Afterschool program coordinators, university researchers, service learning students, and children represented the most common groups interacting with each other. Broadly speaking, university researchers came to the research sites with the type of advanced expertise in basic literacies that one attains through extended years of formal schooling. Along similar lines, undergraduates had experienced many years of basic literacy instruction. Both the researcher and student groups had varying levels of competency with ICT literacies and knowledge of youth cultures. Community-based workers and volunteers also had wide ranging levels of competency with youth cultures, ICT, and basic literacies. Although the children themselves had diverse sets of expertise, they all held deep knowledge of popular culture, particularly those narratives, texts, and toys geared toward youth. Proficiency in multiple languages was common among all the groups.

The Fifth Dimension operated within a Boys & Girls Club located in northern San Diego County. As a setting, community centers such as Boys & Girls Clubs and school-based child-care programs provide supervision of children during afterschool hours. They attempt to perform important community functions such as providing a safe, pro-social environment for their child participants. This particular branch had its own collection of books (a small library) and an adjacent computer lab. Each group of participants in the 5D "touched" the digital story in different capacities from its initial development through its presentation at a 5D film festival where all the digital stories produced the semester in question were shown to a Boys & Girls Club-wide audience. The localized contingencies, affordances, and constraints of the setting, higher education, and each individual's goals for participation all shaped the trajectory of activity.

Afterschool Program Coordinators

Digital Storytelling activities coordinated by 5D researchers were introduced, in part, to meet the needs of the Afterschool Program Coordinators: safe, social activities that provided engaging opportunities for children to learn and have fun. One of the program coordinators, John, worked with the service learning students on producing the digital story with Rebekah.

> Rebekah was our director, I was the camerawoman, and Helen, Zoe, Rebekah, John, and Harmony were the main actors. Harmony and I helped Rebekah make little signs out of

> construction paper to hang around each of the robbers' necks to identify "Crazy," "Creepy," and "Ugly." Rebekah found another undergraduate to play the role of "Crazy," and I was designated as "Ugly," and Harmony was "Creepy." [BW: 10/26/04]

Observations made of John by researchers and the service learning students indicate that he cared deeply about the children of the 5D (having worked in the after-school program for numerous years). Perhaps this is one reason why he participated as an actor in Rebekah's digital story and provided thoughtful feedback on her work.

> John came over and found out that he is in our movie, and stuck around for a few minutes to compliment Rebekah on her storyboard… [BW: 10/26/04]

Researchers

Fifth Dimension researchers wanted to integrate digital storytelling into the activity mix so that participants could gain experience with technologies of media production while developing literacies related to building and expressing narratives through print and dramatic performance. One goal of the study as a design project was to work with the various adult groups to pool what was known about youth cultures and find connections between these competencies and ICT literacies. The research design attempted to incorporate activities mediated by specially designed artifacts and guided by service learning students.

Equally important to researchers was the education of the undergraduate service learning students who worked as field ethnographers conducting qualitative research while they engaged in homework help and educative play activities with K-6 child participants. Researchers used digital storytelling activities as a context where students could experience fieldwork methods and new approaches to designing instructional activities while learning to understand localized practices and contingencies associated with community work. The study attempted to infuse the 5D with collaborative activities that would provide students with the opportunity to work closely with children—learning from them, being reflexive about their own participation, and beginning to understand the situated learning and development of children.

Service Learning Students

Service leaning students related to the digital story as one assignment of many associated with their undergraduate coursework. The desire on the part of the students to do well in the course certainly motivated them to embrace the assignment. On the other hand, many of the students came to the 5D with little experience working with children—oftentimes being somewhat lacking in confidence in their ability to engage the children in joint activity.

> As I finished reading the end of her story, she asked me if it would be ok if she added more to it. I was surprised by her enthusiasm, and of course welcomed the opportunity to have a child who really wanted to do this digital story with me. [BW: 10/26/2004]

The service learning student's stated happiness to have a "child who really wanted to do this digital story with me" spoke not only of the students' hopes to complete the assignment but of their need to be liked and accepted by the children they worked with.

Child Participants

Rebekah's motivations to create a digital story seemed to be related to numerous observed affinities. First, Rebekah seemed to be highly motivated by the opportunity to perform as afforded by digital storytelling. Rebekah's enjoyment as she pretended to handcuff the "ugly thief" character was palpable when she announced that the thief was "lying" and escorts her away to jail.

> Rebekah was definitely taking her role as the Secret Service seriously, saying the cutest things to try to interrogate the robbers. She asked each one, "Where were you last night?" and, "Did you take these nice peoples' TV?" Then, before I got the chance to play my role, another little girl came up to us, saw what we were doing, and asked if she could be part of it. Her name is Mischa and she asked specifically if she could play the role of "Ugly, the robber." I gladly handed over the sign hanging around my neck that read, "UGLY"… [BW: 10/24/04]

Mischa, the other child participant in the production of the digital story seemed likewise motivated by the opportunity to perform. The experiences among the service learning students (Betty, Harmony, and Bethany), John (the afterschool program coordinator), and the two girls (Rebekah and Mischa) demonstrates most strongly how the digital story became an artifact around which shared imagining could emerge.

> …each participant really seemed to have fun with their role, getting into character. The undergrad who played, "Crazy," started dancing and shaking her head really crazily, and Harmony said she was doing something with a beetle (on the recommendation of Mischa), and Mischa lived up to her character as the ugly thief, saying last night she was looking at herself in the mirror and screaming when Rebekah/the Secret Service asked her what she was doing last night. Then Rebekah said that she was lying, and pretended to handcuff her and escort her away to jail. [BW: 10/27/04]

The positive feedback Rebekah received from the afterschool program coordinator, John (shown in a previous quote), and her mother may have been an additional factor in her desire to continue working on the digital story over time.

> Rebekah's mother came in to pick her up. We let her read Rebekah's story and she seemed intrigued and impressed. [BW]

The trajectory of collaboratively produced digital story described here makes visible the ways in which different groups were able to work together to achieve diverse goals. Participation in the digital story was distributed across multiple task domains including: articulation work (the tasks necessary for the digital story as intervention to be implemented), narrative-building and storyboarding, filming and editing, directing, performance, and screening (see Table 10.2 for a summary of participation).

Table 10.2 Participation in digital storytelling practices by group

Practice	Children	Service learning students	Afterschool program coordinators	Researchers
Digital story as intervention		X	X	X
Narrative building and storyboarding	X	X		
Dramatic performance	X	X	X	
Directing enactment	X			
Filming and editing		X		
Digital story screening	X	X	X	X

Taken together, these tasks made the resulting digital storytelling collaborative at almost every step of its development. The collaborative design resulted in an activity that effectively comingled adults and children with varying levels of expertise and abilities—an exciting context for learning.

How Might a Collaborative Structure Impact Opportunities for Learning?

The trajectory of Rebekah's digital story allowed her to work closely with service learning students, peers, and an afterschool program coordinator. Via joint imagining, the narrative that emerged allowed all parties to engage in dramatic performance. Rebekah was able to take an active role in guiding the activity of adults and older children. In turn, the undergraduates were able to broker a context where a younger child, Rebekah, was able to extend and practice basic literacies related to developing narratives, reading, writing, and drawing.

> Rebekah came and found me and asked to continue working on her movie. I pulled the storyboard we had been working on out of my wet backpack and reviewed her story with her. I asked her to read it, and at first she was very shy and shook her head that she didn't want to read it. "No, you!" she said, wanting me to read it. I said, "How about if I help you." That's all I needed to say, because once she started reading, she was just fine. She rarely messed up and seemed to read with great ease and speed. Every now and then she misread a word as something else it sounded like, but she continued to read, rather than stopping, getting frustrated, or asking me for help. I did help correct her when she misread a word, but on the whole, she did very well. When it was time to turn the page over and read the back, she claimed it was my turn. I indulged her and read the back side, because she had done so well and worked so hard on the entire front side. [BW: 10/27/04]

Rebekah also learned how to work with a group of people over a number of days to accomplish a goal. She developed a project that she could share with her local community and family. Although the undergraduates did not involve her with all aspects of technical tasks in terms of modifying footage, the project built Rebekah's competencies in videography and vocabulary in the areas of video production and storytelling. Rebekah also moved toward mastery in basic literacy through efforts at overcoming challenges in reading and writing.

Rebekah's digital story was robust enough to support complex practices and forms of activity while being flexible enough to accommodate the goals of child and adult participants. Forms of participation were characterized by engagement in new practices and movement toward mastery in existing competencies.

The collaborative nature of the digital story likewise resulted in a scenario where lifeworlds worked in parallel. When service learning students worked with researchers and afterschool programmers to design the digital story as intervention, they experienced the artifact as conceptual practice. In short, the undergraduates engaged with digital storytelling as learning design. When they shared the digital story with the children, via joint narrative building and imagining, their participation moved from theory into practice.

> I am very proud of the work we completed with Rebekah today. I was really intimidated by this digital story project, but I think enough of the undergraduates have cooperatively worked together to make this seem appealing to the kids that Rebekah approached me to make one! Not only did she just say she was interested in making one, but I was also very impressed with Rebekah's creativity and ingenuity for this story. She came up with what seems like a very original story, although I'm sure if we analyzed her life we could find great parallels, and followed through with every aspect of the movie making thus far.
>
> Rebekah actually helped gather characters to act in her movie and followed through with her part as the Secret Service as well. She did not grow bored with the storyboard or afterwards when it came time to actually film. It's just the editing and special effects that needs to take place now, which unfortunately she cannot help with right now since I'll be working on it at home. But hopefully I'll find a way to keep her involved; and I'm sure her mom would love a copy for Hanukkah! I really enjoyed working on this project with her today, and feel as though doing this project has given us not only a goal, but also a something to work through with the kids through which we can bond with them. I feel like Rebekah has demonstrated complete brilliance for a first grader and has probably learned so much just by interacting with Harmony and I about storytelling and movie making. But the best part is that she seemed to be eager and having fun with it, playing and acting. Now that seems to be the real goal of the 5th Dimension. [BW: 10/27/04]

Along similar lines to the experience of Rebekah, the service learning students engaged in practices that were new to them and moved toward mastery of existing competencies (e.g., related to the technology of videography and film editing). Designing learning contexts for children that supported narrative learning, reading, and writing were new forms of expertise that they developed through participation in the digital story as were the competencies related to forming/recording ethnographic observations for subsequent analyses. The undergraduates learned how to step into the lifeworlds of their child participants enabling them to broker a series of interactions that were supportive of their own learning as well as engaging to Rebekah and Mischa.

Conclusions

Afterschool and other out-of-school learning contexts such as libraries and museums are uniquely suited to creating programming inhabited by educative and engaging practices due to their flexibility and, in this case, strong partnerships with other community organizations. One of the greatest challenges involving program design involves devising a way to design activities that are both intellectually enriching and engaging to children. Digital storytelling represents one approach to developing meaningful and transformative programming for children due to its permeability to the goals of both adults and children and thus its potential for collaboration. Findings here suggest that collaboratively produced digital stories have the potential to support learning and development due to their comingling of multi-generational forms of expertise and perspectives. Along different lines than digital stories produced individually, the collaborative digital story presented here created contexts where both service learning students and child participants were able to engage in new practices and move toward mastery of existing ones. Individual meaning-making was enhanced by the comingling of lifeworlds that occurred in joint imagining and digital production. As evidenced by the experiences of Rebekah, when children's goals can coexist and enrich those of designers, intervention design for youth participants is at its most relevant.

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Part III
Leadership Profiles

Chapter 11
Introduction

Tonia A. Dousay

The purpose of this section is to profile individuals who have made significant contributions to the field of educational media and communication technology. Leaders profiled in the *Educational Media and Technology Yearbook* have typically held prominent offices, composed seminal works, and made significant contributions that influence the contemporary vision of the field. People profiled in this section are usually emeritus faculty who may or may not be active in the field. However, those profiled in this section have often been directly responsible for mentoring individuals, who have themselves, become recognized for their own contributions to learning, design, and technology.

You are encouraged to nominate individuals to be featured in this section of the Yearbook. The editors of this Yearbook will carefully consider your nomination. Please direct comments, questions, and suggestions about the selection process to Tonia Dousay <teedee@uga.edu> or Rob Branch <rbranch@uga.edu>.

There are special reasons to feature people of national and international reputation. This volume of the *Educational Media and Technology Yearbook* recognizes individuals whose life work represents the tradition of leadership in educational media and communication technology. The leaders who profiled this year are:

Philip L. Doughty
David H. Jonassen

T.A. Dousay (✉)
Department of Professional Studies, University of Wyoming, Laramie, WY, USA
e-mail: tdousay@uwyo.edu

M. Orey et al. (eds.), *Educational Media and Technology Yearbook*, Educational Media and Technology Yearbook 38, DOI 10.1007/978-3-319-06314-0_11,

The following people [listed alphabetically] were profiled in earlier volumes of the *Educational Media and Technology Yearbook*:

John C. Belland	David R. Krathwohl
Robert K. Branson	Jean E. Lowrie
James W. Brown	Wesley Joseph McJulien
Bob Casey	M. David Merrill
Betty Collis	Michael Molenda
Robert E. De Kieffer	David Michael Moore
Robert M. Diamond	Robert M. Morgan
Walter Dick	Robert Morris
Frank Dwyer	James Okey
Donald P. Ely	Ronald Oliver
James D. Finn	Tjeerd Plomp
Robert Mills Gagné	Tillman (Tim) James Ragan
Castelle (Cass) G. Gentry	W. Michael Reed
Thomas F. Gilbert	Thomas C. Reeves
Kent Gustafson	Rita C. Richey
John Hedberg	Paul Saettler
Robert Heinich	Wilbur Schramm
Stanley A. Huffman	Charles Francis Schuller
Harry Alleyn Johnson	Don Carl Smellie
Roger Kaufman	Glenn Snelbecker
Jerrold E. Kemp	Howard Sullivan
Addie Kinsinger	William Travers
	Constance Dorothea Weinman
	Paul Welliver
	Paul Robert Wendt
	Ronald Zemke

Chapter 12
Dr. Philip L. Doughty

Tonia A. Dousay

Dr. Philip L. Doughty is widely known for being a dynamic teacher who loves helping students. Whether it is working to uncover strengths or motivating students to accomplish their goals, Dr. Doughty has had a lasting impact at Syracuse University, including bringing widespread esteem to the Instructional Design, Development and Evaluation (IDD&E) Department. Dr. Doughty began his own educational journey at Kansas University, obtaining a Bachelor of Science in Social Science and Education in 1965 and a Master of Science in Educational Administration in 1965. His academic journey then took him to Florida State University, where he completed a doctorate in Instructional Systems Design in 1972. Although Dr. Doughty established and served out his career at Syracuse University, advancing to the rank of Professor Emeritus, he continues to be active on campus and in professional organizations.

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M. Orey et al. (eds.), *Educational Media and Technology Yearbook*, Educational Media and Technology Yearbook 38, DOI 10.1007/978-3-319-06314-0_12,

True Dedication to Teaching, Research, and Service

Dr. Phil Doughty has worn many hats during his time at Syracuse University. He joined the faculty in 1972 and has dedicated his career to serving higher education. Doughty served as program chair of the IDD&E Department from 1979 to 1986 and again from 2004 to 2007. Other roles that Doughty has assumed over the years include serving as director for the Syracuse University Division of Educational Development, Counseling, and Administrative Studies from 1986 to 1992, interim dean of the Syracuse School of Education for a year, and executive director of the Training Systems Institute. Even after attaining Emeritus status and retiring from the university, Doughty was asked to return and serve as interim chair of the Department of Exercise Science in 2009. As a former colleague noted, Dr. Doughty, has the "ability to work across borders, languages and cultures to actively and practically improve the quality of education at national and institutional levels" (J. Eggert, personal communication, February 21, 2008). Over the many years he served as an administrator, Doughty played a significant role in developing faculty training for online programs and contributing to programs for nontraditional students. Dr. Doughty has generously devoted his time and talents to professional service.

As a teacher, Doughty has shaped and contributed to the professional development of more than 2000 students over the course of 30 years. Students completing graduate level coursework in instructional development, cost-effectiveness analysis, project management, human resource development, and front-end analysis all benefited from Dr. Doughty's many years of experience and expertise. In fact, multiple organizations have recognized Doughty's excellence in teaching and mentoring, including the Syracuse University National Alumni Association who named him the Syracuse University 2003 Outstanding Teacher. Doughty was also named the Syracuse University Teacher of the Year in 2004 by the university's administration. In 2006, the University Continuing Education Association (UCEA), which comprises 430 institutions from 16 countries, awarded Dr. Doughty the Excellence in Teaching Award. The award was presented in recognition of Doughty's outstanding teaching, course development, mentoring, and service to education. Examples of Dr. Doughty's commitment to students are evident through the numerous graduate internships he assisted in obtaining in which students were able to gain hands-on experience and the partnerships he forged with industry to provide an outlet through which students could work on grants and apply theoretical knowledge in a practical setting.

Doughty's contributions to instructional design and evaluation theory and practice are reflected in his scholarly activities and commitment to professional organizations. Companies and organizations such as the New York State Department of Education, Navy Personnel Research and Development Center, US Department of Education, US Army Engineer School, Mellon Foundation, American Express Corporation, Indonesian Ministry of Education, National Iranian Radio and Television, and many more have all benefited from research and development projects completed under Doughty's direction. These projects reinforced his dedication to research implementing the basic tenets of instructional design while providing opportunities for students and faculty to experience practical applications. In 1994, Doughty served on the AECT/NCATE Guidelines Task Force for the Association for Educational Communications and Technology's NCATE program standards. AECT also recognizes Doughty's contributions to collecting and making available the entire publication collection of the *Journal of Instructional Development* (*JID*) for members. Additionally, Doughty has spent the past five years serving on the Central New York chapter of the American Society for Training & Development (ASTD) BEST Committee, which recognizes excellence in learning and performance practices in the central New York area.

After more than 40 years of dedicated service to the field, Doughty continues to have a lasting impact. From students who continue to share the knowledge and expertise they gained in his courses or under his guidance to program standards and awards to which Doughty contributes, current and future generations will continue only benefit from the significant and lasting impact that Dr. Philip L. Doughty has had on instructional design and technology.

Chapter 13
Tribute to David Jonassen, Curators' Distinguished Professor of Education, University of Missouri

Tonia A. Dousay

David H. Jonassen (1947–2012) began his distinguished career in instructional technology as a cameraman for educational television at the University of Delaware in the late 1960s. Jonassen was known for saying, "I've made many mistakes in my life, but choice of career wasn't one of them." A pioneer in the field, Dr. Jonassen is perhaps most well known as a constructivist who promoted cognitive tools and later focused on problem solving and problem-based learning (PBL). Thus, nearly anyone who has ever taken a class in instructional technology has found himself or herself reading one of Jonassen's 37 books, 182 journal articles, or 67 book chapters at some point in their academic career. In 2012, shortly before his passing, Dr. Jonassen was named the first recipient of the Association for Educational Communications and Technology (AECT) David H. Jonassen Award for Excellence in Research, which was established in his honor. The legacy that Jonassen leaves behind includes pushing the field of instructional technology to embrace constructivism and look at the broader implications of technological influence in the classroom.

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Changing the Culture of Learning

Dr. David Jonassen had a very distinct sense of personal responsibility. His independence and self-reliant attitude came naturally from his upbringing in southern Indiana. The personal drive and energy he exuded likely derived from his desire to be physically active and his passion for mountain climbing. Jonassen once said, "There's something spiritual about going up a mountain." This sentiment was certainly evident in the personal and professional life that he lived and the legacy he leaves behind.

Jonassen's interest in the field of instructional technology was an accidental journey. He graduated from the University of Delaware in 1970 with a Bachelor of Science in Business Administration/Finance and worked a variety of jobs including shelving library books and assisting fellow students in the registration office. When Jonassen responded to an ad for a television cameraman, he found himself filming and directing educational television programming. It was this experience combined with the mentoring of a colleague who was pursuing a Master's degree in educational media that Jonassen realized he had found his career. However, his undergraduate degree would not help him in this journey. Thus, Jonassen continued his studies, graduating in 1972 with a Master of Education in Elementary Education and taught reading and language arts to elementary and middle school students. Throughout his studies, Jonassen began to research psychology on his own and eventually enrolled in the educational media doctoral program at Temple University in Philadelphia. His intrinsic drive to pursue psychology is what prompted his change of majors to educational psychology, and he later completed a postdoc at the University of North Carolina in computer science, statistics, and philosophy. Jonassen began his academic career in higher education teaching educational media techniques and design at the University of North Carolina at Greensboro in the Library Science and Educational Technology Department. He spent 10 years designing and developing courses in instructional media and a self-instruction laboratory. During this time, the field was focused on the effectiveness of media as a conveyer of information or what we call message design. Jonassen was ahead of his peers, though, leading the transition to learning strategies over instructional strategies. He was focused on discovering what learners could accomplish irrespective of what was being taught. It was this sense of intrinsic motivation that drove Jonassen to write, and specifically to edit the *Handbook of Research on Educational Communications and Technology*. He truly enjoyed producing handbooks that could help the field expand and teach the next generation of researchers where to begin.

In his interview with the AECT History Maker's project, Jonassen noted that he was a born empiricist and implicational thinker, always looking at the implications of current research and seeking to identify the needs of the field. Thus, in the late 1980s, while at the University of Colorado Denver, he began to examine computers and their influence, designing curriculum on how to use microcomputers. While many in the field focused their efforts on computers as a teaching medium, Jonassen was thinking about better uses for computers. This was perhaps what led to his significant transition into constructivism. Jonassen was always interested in what people do *with* media rather than *from* media. Rather than looking at methods and media, he felt the field should be looking at all of the different technologies students use to construct their knowledge of the world. Jonassen believed that computers should be used to engage students in critical thinking by functioning as knowledge representation. The passion he felt for this line of inquiry opened up the field to the concept of mindtools to create mental models and foster critical thinking. Perhaps a personal precursor to this shift was Jonassen's work in cognitive modeling and task analysis. He had followed David Merrill's work in instructional design, finding it to be one of the more coherent theories of the time. Within instructional design, Jonassen focused specifically on task analysis, calling it the heart and soul of any design that was often overlooked. When it came to task analysis, Jonassen was known for telling his students, "If you aren't able to articulate how your learners are supposed to think, you have no business designing instruction for them."

The introduction of the Internet shifted Jonassen's focus again during the mid 1990s. Instructional design was an underlying theme in much of his work, and he noticed that problem solving was absent in the literature. Jonassen began by asking, "What is problem solving?" From there, he branched out into looking at different kinds of problems and eventually seeking to answer how we support, engage, and assess different kinds of problem solving. The groundwork he laid with mindtools and cognitive modeling would make way to helping learners create a representation of a problem as they attempted to solve it. He noted that the trend towards investigating simulations, games, and immersive environments was based in problem solving. As interest in the field transmogrified from problem-solving research into PBL, Jonassen recognized that students are accustomed to traditional schooling, and problem solving violates their schemas of learning. He believed that schools and universities do a poor job of engaging students in problem solving, and engaging in PBL continues to be a challenge for learners. Of all of his contributions to the field, Jonassen thought that his work on problem solving and problem-based learning would be his legacy. He truly thought that PBL is the most significant pedagogical innovation in the history of education and his work continues to shape research and practice. When looking to the future, Jonassen knew that the questions are changing, particularly with the influence of social networking and communication. The social psychology of identity and responsibility in social networking environments might have been his next area of inquiry. However, PBL was never far from his thoughts. He felt that we are still an integration or two away from effectively implementing and investigating the potential of virtual realities, but that the possibilities were endless. Jonassen knew that there is so much that we do not yet know about problem solving and so many unanswered questions.

If there was one bit of advice we could all take away from Jonassen, it was the message that dualistic thinking is destructive to our field. We need the ability to accommodate multiple beliefs and perspectives. There is no unified theory of learning and survival of our field is key to accepting this. Jonassen did not advocate for one specific methodology, but recognized that we all had preferences. Dr. David Jonassen's long and distinguished career took him to the top of many mountains around the world, and he never stopped moving forward. Defiantly active despite developing lung cancer, Jonassen was truly a pioneer with vision, passion, and persistence that will undoubtedly inspire current and future generations in the field of instructional technology to change the culture of learning for the better.

Part IV
Organizations and Associations in North America

Chapter 14
Introduction

Michael Orey

Part four includes annotated entries for associations and organizations, most of which are headquartered in North America, whose interests are in some manner significant to the fields of learning, design and technology, or library and information science. For the most part, these organizations consist of professionals in the field or agencies that offer services to the educational media community. In an effort to only list active organizations, I deleted all organizations that had not updated their information since 2011. Any readers are encouraged to contact the editors with names of unlisted media-related organizations for investigation and possible inclusion in the 2014 edition.

Information for this section was obtained through e-mail directing each organization to an individual web form through which the updated information could be submitted electronically into a database created by Michael Orey. Although the section editor made every effort to contact and follow-up with organization representatives, responding to the annual request for an update was the responsibility of the organization representatives. The editing team would like to thank those respondents who helped assure the currency and accuracy of this section by responding to the request for an update. Figures quoted as dues refer to annual amounts unless stated otherwise. Where dues, membership, and meeting information are not applicable, such information is omitted.

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Chapter 15
Worldwide List of Organizations in Learning, Design, Technology, Information, or Libraries

Michael Orey

Name of Organization or Association—Adaptech Research Network

Address:
Dawson College, 3040 Sherbrooke St. West
Montreal, QC
H3Z 1A4
Canada

Phone Number—514-931-8731 #1546; Fax Number—514-931-3567 Attn: Catherine Fichten

Email Contact—catherine.fichten@mcgill.ca; URL—http://www.adaptech.org

Leaders—Catherine Fichten, Ph.D., Co-director; Jennison V. Asuncion, M.A., Co-director; Maria Barile, M.S.W., Co-director

Description—Based at Dawson College (Montreal), we are a Canada-wide, grant-funded team, conducting bilingual empirical research into the use of computer, learning, and adaptive technologies by postsecondary students with disabilities. One of our primary interests lies in issues around ensuring that newly emerging instructional technologies are accessible to learners with disabilities.

Membership—Our research team is composed of academics, practitioners, students, consumers, and others interested in the issues of access to technology by students with disabilities in higher education.

Publications—2012 Asuncion, J. V., Budd, J., Fichten, C. S., Nguyen, M. N., Barile, M., & Amsel, R. (2012). Social Media Use By Students With Disabilities. Academic Exchange Quarterly, 16(1), 30–25, Editors Choice. ISSN 1096-1453. 2012 Barile,

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M. Orey et al. (eds.), *Educational Media and Technology Yearbook*, Educational Media and Technology Yearbook 38, DOI 10.1007/978-3-319-06314-0_15,

M., Nguyen, M.N., & Fichten, C.S. (2012). L'accessibilité universelle en pédagogie: des avantages pour toutes et tous! Pédagogie Collégiale, 25(4), 20–22. 2012 Fichten, C.S., King, L., Nguyen, M.N., Barile, M., Havel, A., Chauvin, A., Budd, J., Mimouni, Z., Raymond, O., Juhel, J-C. (2012). Utiliser les technologies de l'information et de la communication afin d'améliorer la réussite collégiale des étudiants ayant des troubles d'apprentissage. Pédagogie Collégiale, 25(4), 32–37. 2012 Jorgensen, S., Fichten, C.S., & Havel, A. (2012). Les élèves satisfaits de leur expérience collégiale, sont-ils plus enclins à persévérer dans leurs études? Liens entre la satisfaction, les notes, le sexe et la présence ou non dincapacité. Pédagogie Collégiale, 25(4), 38–44. 2012 Fichten, C.S., Jorgensen, S., Havel, A., Barile, M., Ferraro, V., Landry, M-E., Fiset, D., Juhel, J-C., Chwojka, C., Nguyen, M.N., & Asuncion, J.V. (2012). What happens after graduation? Outcomes, employment, and recommendations of recent junior/community college graduates with and without disabilities. Disability and Rehabilitation 34(11), 917–924. 2011 Jorgensen, S., Fichten, C.S., & Havel, S. (2011). College satisfaction and academic success/ Satisfaction et réussite académique au cégep. Final report presented to PAREA (206 pages). Montréal: Dawson College. Eric Document Reproduction Service (ED522996.) 2010 Asuncion, J.V., Fichten, C.S., Ferraro, V., Barile, M., Chwojka, C., Nguyen, M.N., & Wolforth, J. (2010). Multiple perspectives on the accessibility of e-learning in Canadian colleges and universities. Assistive Technology Journal, 22(4), 187–199. DOI: 10.1080/10400430903519944 2010 Fichten, C.S., Asuncion, J.V., Nguyen, M.N., Budd, J., & Amsel, R. (2010). The POSITIVES Scale: Development and validation of a measure of how well the ICT needs of students with disabilities are met. Journal of Postsecondary Education and Disability, 23(2), 137–154. 2010 Fichten, C.S., Nguyen, M.N., Asuncion, J.V., Barile, M., Budd, J., Amsel, R. & Libman, E. (2010). Information and communication technology for French and English speaking postsecondary students with disabilities: What are their needs and how well are these being met? Exceptionality Education International, 20(1), 2–17. 2010 Fichten, C.S., Asuncion, J.V., Nguyen, M.N., Budd, J., Barile, M., & Tibbs, A. (2010). The POSITIVES Scale: A method for assessing technology accessibility in postsecondary education. Proceedings of the CSUN (California State University, Northridge) Technology and Persons With Disabilities Conference, Los Angeles, California. Proceedings paper retrieved April 4, 2011, from http://www.letsgoexpo.com/utilities/File/viewfile.cfm?LCID=3861&eID=80000218 2010 Asuncion, J.V., Fichten, C.S., Budd, J., Gaulin, C., Amsel, R., & Barile, M. (2010). Preliminary findings on social media use and accessibility: A Canadian perspective. Proceedings of the CSUN (California State University, Northridge) Technology and Persons With Disabilities Conference, Los Angeles, California. Proceedings paper retrieved April 4, 2011, from http://www.letsgoexpo.com/utilities/File/viewfile.cfm?LCID=4145&eID=80000218 2009 Fichten, C.S., Ferraro, V., Asuncion, J.V., Chwojka, C., Barile, M., Nguyen, M.N., Klomp, R., & Wolforth, J. (2009). Disabilities and e-learning problems and solutions: An exploratory study. Educational Technology and Society, 12 (4), 241–256. 2009 Fichten, C.S., Asuncion, J.V., Barile, M., Ferraro, & Wolforth, J. (2009). Accessibility of eLearning, computer and information technologies to students with visual impairments in

postsecondary education. Journal of Visual Impairment and Blindness, 103(9), 543–557. 2009 Jorgensen, S., Fichten, C.S., & Havel, A. (2009). Academic success of graduates with and without disabilities—A comparative study of university entrance scores. Pédagogie Collégiale, 22(5) Special Issue, 26–29. 2009 Ferraro, V., Fichten, C.S., & Barile, M. (2009). Computer use by students with disabilities: Perceived advantages, problems and solutions. Pédagogie Collégiale, 22(5) Special Issue, 20–25. 2009 Nguyen, M.N., Fichten, C.S., & Barile, M. (2009). Les besoins technologiques des élèves handicapés du postsecondaire sont-ils satisfaits ? Résultats de l'utilisation de l'Échelle d'accessibilité des technologies informatiques adaptatives pour les élèves handicapés au postsecondaire (SAITAPSD): version pour les élèves. Pédagogie Collégiale, 22(2), 6–11. 2009 Fichten, C.S., Asuncion, J.V., Nguyen, M.N., Wolforth, J., Budd, J., Barile, M., Gaulin, C., Martiniello, N., Tibbs, A., Ferraro, V., & Amsel, R. (2009). Development and validation of the Positives Scale (Postsecondary Information Technology Initiative Scale) (136 pages). Final report for the Canadian Council on Learning. ERIC (Education Resources Information Center) ED505763. Retrieved July 27, 2009, http://www.eric.ed.gov/ERICWebPortal/contentdelivery/servlet/ERICServlet?accno=ED505763 and Retrieved August 29, 2010, from http://www.ccl-cca.ca/pdfs/OtherReports/Fichten-Report.pdf 2009 Jorgensen, S., Fichten, C.S., & Havel, A. (2009). Prédire la situation de risque des étudiants au collège: Hommes et étudiants ayant des incapacités/Predicting the at risk status of college students: Males and students with disabilities. (257 pages). Final report to PAREA. ERIC (Education Resources Information Center) (ED505871). Retrieved July 30, 2009, from http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/44/a4/62.pdf 2009 Jorgensen, S., Ferraro, V., Fichten, C.S., & Havel, A. (2009). Predicting college retention and dropout: Sex and disability. (10 pages). ERIC (Education Resources Information Center) (ED505873). Retrieved July 30, 2009, from http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/44/a4/65.pdf

Name of Organization or Association—Agency for Instructional Technology

Acronym—AIT

Address:
1800N Stonelake Drive
Bloomington, IN
47404
US

Phone Number—(812)339-2203; Fax Number—(812)333-4218

Email Contact—info@ait.net; URL—http://www.ait.net

Leaders—Charles E. Wilson, Executive Director

Description—The Agency for Instructional Technology has been a leader in educational technology since 1962. A nonprofit organization, AIT is one of the largest providers of instructional TV programs in North America. AIT is also a leading developer of other educational media, including online instruction, CDs, videodiscs, and instructional software. AIT learning resources are used on six continents and reach nearly 34 million students in North America each year. AIT products have received many national and international honors, including an Emmy and Peabody award. Since 1970, AIT has developed 39 major curriculum packages through the consortium process it pioneered. American state and Canadian provincial agencies have cooperatively funded and widely used these learning resources. Funding for other product development comes from state, provincial, and local departments of education; federal and private institutions; corporations and private sponsors; and AITs own resources.

Membership—None.

Dues—None.

Meetings—No regular public meetings.

Publications—None.

Name of Organization or Association—American Association of Community Colleges

Acronym—AACC

Address:
One Dupont Circle, NW, Suite 410
Washington, DC
20036-1176
US

Phone Number—(202)728-0200; Fax Number—(202)833-9390

Email Contact—twhissemore@aacc.nche.edu; URL—http://www.aacc.nche.edu

Leaders—Walter G. Bumphus, President and CEO

Description—AACC is a national organization representing the nations more than 1,195 community, junior, and technical colleges. Headquartered in Washington, D.C., AACC serves as a national voice for the colleges and provides key services in the areas of advocacy, research, information, and leadership development. The nations community colleges serve more than 13 million students annually, almost half (46 %) of all US undergraduates.

Membership—1,167 institutions, 31 corporations, 15 international associates, 79 educational associates, 4 foundations.

Dues—vary by category

Meetings—Annual Convention, April of each year; 2013: April 20–23, San Francisco, CA

Publications—Community College Journal (bi-mo.); Community College Times (daily online); Community College Press (books, research and program briefs, and monographs).

Name of Organization or Association—American Association of School Librarians

Acronym—AASL

Address:
50 East Huron Street
Chicago, IL
60611-2795
US

Phone Number—(312) 280-4382 or (800) 545-2433, ext. 4382; Fax Number—(312) 280-5276

Email Contact—aasl@ala.org; URL—http://www.ala.org/aasl

Leaders—Julie A. Walker, Executive Director

Description—A division of the American Library Association, the mission of the American Association of School Librarians is to advocate excellence, facilitate change, and develop leaders in the school library field

Membership—8,000

Dues—Personal membership in ALA (beginning FY 2009, 1st yr., $65; 2nd yr., $98; 3rd and subsequent yrs., $130) plus $50 for personal membership in AASL. Student, retired, organizational, and corporate memberships are available.

Meetings—National conference every 2 years; next national conference to be held in 2013.

Publications—School Library Research (electronic research journal at http://www.ala.org/aasl/SLR) Knowledge Quest (print journal and online companion at http://www.ala.org/aasl/kqweb) AASL Hotlinks (e-mail newsletter) Non-serial publications (http://www.ala.org/ala/aasl/aaslpubsandjournals/aaslpublications.cfm)

Name of Organization or Association—American Educational Research Association

Acronym—AERA

Address:
1430K Street, NW, Suite 1200
Washington, DC
20005
US

Phone Number—(202) 238-3200; Fax Number—(202) 238-3250

Email Contact—outreach@aera.net; URL—http://www.aera.net

Leaders—William Tierney, President of the Council, 2012–2013

Description—The American Educational Research Association (AERA) is the national interdisciplinary research association for approximately 25,000 scholars who undertake research in education. Founded in 1916, AERA aims to advance knowledge about education, to encourage scholarly inquiry related to education, and to promote the use of research to improve education and serve the public good. AERA members include educators and administrators; directors of research, testing, or evaluation in federal, state, and local agencies; counselors; evaluators; graduate students; and behavioral scientists. The broad range of disciplines represented includes education, psychology, statistics, sociology, history, economics, philosophy, anthropology, and political science. AERA has more than 160 Special Interest Groups, including Advanced Technologies for Learning, NAEP Studies, Classroom Assessment, and Fiscal Issues, Policy, and Education Finance.

Membership—25,000 Regular Members: Eligibility requires satisfactory evidence of active interest in educational research as well as professional training to at least the masters degree level or equivalent. Graduate Student Members: Any graduate student may be granted graduate student member status with the endorsement of a voting member who is a faculty member at the students university. Graduate Students who are employed full time are not eligible. Graduate Student membership is limited to 5 years.

Dues—vary by category, ranging from $40 for graduate students to $150 for voting members, for 1 year. See AERA website for complete details: http://www.aera.net

Meetings—2013 Annual Meeting, April 27–May 1, San Francisco, California

Publications—Educational Researcher; American Educational Research Journal; Journal of Educational and Behavioral Statistics; Educational Evaluation and Policy Analysis; Review of Research in Education; Review of Educational Research. Books: Handbook of Research on Teaching, 2001. (revised, 4th edition) Black Education: A Transformative Research and Action Agenda for the New Century, 2005, Studying Teacher Education: The Report of the AERA Panel on Research and Teacher Education, 2006, Handbook of Education Policy Research, 2009, Estimating Causal Effects: Using Experimental and Observational Designs, Handbook of Complementary Methods in Education Research, 2006, Studying Diversity in Teacher Education, 2011, Research on Schools, Neighborhoods, and Communities, 2012, Standards for Educational and Psychological Testing (revised and expanded, 1999). Co-published by AERA, American Psychological Association, and the National Council on Measurement in Education

Name of Organization or Association—American Library Association

Acronym—ALA

Address:
50 E. Huron St.
Chicago, IL
60611
US

Phone Number—(800) 545-2433; Fax Number—(312) 440-9374

Email Contact—library@ala.org; URL—http://www.ala.org

Leaders—Keith Michael Fiels, Exec. Dir.

Description—The ALA is the oldest and largest national library association. Its 62,000 members represent all types of libraries: state, public, school, and academic, as well as special libraries serving persons in government, commerce, the armed services, hospitals, prisons, and other institutions. The ALA is the chief advocate of achievement and maintenance of high-quality library information services through protection of the right to read, educating librarians, improving services, and making information widely accessible. See separate entries for the following affiliated and subordinate organizations: American Association of School Librarians, Association of Library Trustees, Advocates, Friends and Foundations, Association for Library Collections and Technical Services, Association for Library Service to Children, Association of College and Research Libraries, Association of Specialized and Cooperative Library Agencies, Library Leadership and Management Association, Library and Information Technology Association, Public Library Association, Reference and User Services Association, Young Adult Library Services Association, and the Learning Round Table of ALA (formerly the Continuing Library Education Network and Exchange Round Table).

Membership—62,000 members at present; everyone who cares about libraries is allowed to join the American Library Association.

Dues—Professional rate: $65, first year; $98, second year; third year & renewing: $130 Library Support Staff: $46 Student members: $33 Retirees: $46 International librarians: $78 Trustees: $59 Associate members (those not in the library field): $59

Meetings—Annual Conference: June 27–July 2, 2013, Chicago, IL; June 26–July 1, 2014, Las Vegas, NV//Midwinter Meeting: January 25–29, 2013, Seattle, WA; January 24–28, 2014, Philadelphia, PA

Publications—American Libraries; Booklist; BooklistOnline.com; Choice; Choice Reviews Online; Guide to Reference; Library Technology Reports; Newsletter on Intellectual Freedom; RDA Toolkit;

Name of Organization or Association—American Society for Training & Development

Acronym—ASTD

Address:
1640 King St., Box 1443
Alexandria, VA
22313-2043
US

Phone Number—(703)683-8100; Fax Number—(703)683-8103

Email Contact—customercare@astd.org; URL—http://www.astd.org

Leaders—Tony Bingham, President and CEO

Description—ASTD (American Society for Training & Development) is the world's largest professional association dedicated to the training and development field. In more than 100 countries, ASTD's members work in organizations of all sizes, in the private and public sectors, as independent consultants, and as suppliers. Members connect locally in 125 US chapters and with 20 international partners. ASTD started in 1943 and in recent years has widened the profession's focus to align learning and performance to organizational results, and is a sought-after voice on critical public policy issues. For more information, visit http://www.astd.org.

Membership—39,000 members in 100 countries

Dues—The Classic Membership ($199.00) is the foundation of ASTD member benefits. Publications, newsletters, research reports, discounts, services, and much more are all designed to help you do your job better. There are also student memberships, joint chapter memberships, and a special rate for international members. Here's what you have to look forward to when you join: T+D magazine—Monthly publication of ASTD. Stay informed on trends, successful practices, case studies, and more. ASTD LINKS—bi-monthly newsletter for and about members. The Buzz—a weekly compilation of news about the training profession. Learning Circuits—Monthly Webzine features articles, departments, and columns that examine learning technologies and how they're being applied to workplace learning. Special Reports and Research—Research reports are published on topics that reflect important issues and trends in the industry. The State of the Industry report is published annually and analyzes spending, practices, and other important data related to learning and development. Do Your Own Research—Members can access the Online Library to research thousands of publications. Career Navigator Tool—find out where you are in your career and what you need to do to develop professionally. Membership Directory—Online directory and searchable by a variety of criteria. Access to the Membership Directory is for members only. EXPO 365 Buyers Guide—A one-stop resource for information on hundreds of training suppliers and consultants.

Meetings—TechKnowledge Conference: January 25–27, 2012, Las Vegas, NV; International Conference & Exposition, May 6–9, 2012, Denver, CO

Publications—T+D (Training & Development) Magazine; Infoline; Learning Circuits; Training and Development Handbook; State of the Industry Report; ASTD Press books; Research reports.

Name of Organization or Association—Association for Continuing Higher Education

Acronym—ACHE

Address:
OCCE Admin Bldg Rm 233, 1700 Asp Ave
Norman, OK
73072
US

Phone Number—800-807-2243; Fax Number—405-325-4888

Email Contact—admin@acheinc.org; URL—http://www.acheinc.org/

Leaders—James P. Pappas, Ph.D., Executive Vice President

Description—ACHE is an institution-based organization of colleges, universities, and individuals dedicated to the promotion of lifelong learning and excellence in continuing higher education. ACHE encourages professional networks, research, and exchange of information for its members and advocates continuing higher education as a means of enhancing and improving society.

Membership—Approximately 1,500 individuals in approximately 650 institutions. Membership is open to institutions of higher learning, professionals, and organizations whose major commitment is in the area of continuing education.

Dues—$85, professional; $510, institutional

Meetings—For a list of Annual and Regional Meetings, see http://www.acheinc.org

Publications—Journal of Continuing Higher Education (3/yr.); Five Minutes with ACHE (newsletter, 9/yr.); Proceedings (annual).

Name of Organization or Association—Association for Educational Communications and Technology

Acronym—AECT

Address:
1800N Stonelake Dr., Suite 2 P.O. Box 2447
Bloomington, IN
47404-2447
US

Phone Number—(812) 335-7675; Fax Number—(812) 335-7678

Email Contact—pharris@aect.org; URL—http://www.aect.org

Leaders—Phillip Harris, Executive Director; Ana Donaldson, Board President

Description—AECT is an international professional association concerned with the improvement of learning and instruction through media and technology. It serves as a central clearinghouse and communications center for its members, who include instructional technologists, library media specialists, religious educators, government media personnel, school administrators and specialists, and training media producers. AECT members also work in the armed forces, public libraries, museums, and other information agencies of many different kinds, including those related to the emerging fields of computer technology. Affiliated organizations include the International Visual Literacy Association (IVLA), Minorities in Media (MIM), New England Educational Media Association (NEEMA), SICET (the Society of International Chinese in Educational Technology), and KSET (the Korean Society for Educational Technology). The ECT Foundation is also related to AECT. Each of these affiliated organizations has its own listing in the Yearbook. AECT Divisions include: Instructional Design & Development, Information, Training & Performance, Research & Theory, Systemic Change, Distance Learning, Media & Technology, Teacher Education, International, and Multimedia Productions.

Membership—2,500 members in good standing from K-12, college and university, and private sector/government training. Anyone interested can join. There are different memberships available for students, retirees, corporations, and international parties. We also have a new option for electronic membership for international affiliates.

Dues—125.00.00 standard membership discounts are available for students and retirees. Additional fees apply to corporate memberships.

Meetings—Annual Convention held each year at the end of October. Summer meeting held each year the third week in July

Publications—TechTrends (6/yr., free with AECT membership; available by subscription through Springer at http://www.springeronline.com); Educational Technology Research and Development (6/yr., $46 members; available by subscription through Springer at http://www.springeronline.com); Quarterly Review of Distance Education (q., $55 to AECT members); many books available on the AECT website for members.

Name of Organization or Association—Association for Library and Information Science Education

Acronym—ALISE

Address:
65 E. Wacker Place Suite 1900
Chicago, IL
60601
US

Phone Number—312-795-0996; Fax Number—312-419-8950

Email Contact—contact@alise.org; URL—http://www.alise.org

Leaders—Kathleen Combs Executive Director

Description—Seeks to advance education for library and information science and produces annual Library and Information Science Education Statistical Report. Open to professional schools offering graduate programs in library and information science; personal memberships open to educators employed in such institutions; other memberships available to interested individuals.

Membership—763 individuals, 69 institutions

Dues—Institutional, sliding scale, \$350–2,500 International \$145.00 Full-Time Personal, \$125.00 Part-Time/Retired \$75.00 Student \$60.00

Meetings—January 22–25, 2013, Seattle, Washington

Publications—Journal of Education for Library and Information Science; ALISE Directory; Library and Information Science Education Statistical Report.

Name of Organization or Association—Association for Library Collections & Technical Services

Acronym—ALCTS

Address:
50 E. Huron St.
Chicago, IL
60611
US

Phone Number—(312)280-5037; Fax Number—(312)280-5033

Email Contact—alcts@ala.org; URL—http://www.ala.org/alcts

Leaders—Charles Wilt, Executive Director

Description—A division of the American Library Association, ALCTS is dedicated to acquisition, identification, cataloging, classification, and preservation of library materials; the development and coordination of the country's library resources; and aspects of selection and evaluation involved in acquiring and developing library materials and resources. Sections include Acquisitions, Cataloging and Classification, Collection Management and Development, Preservation and Reformatting, and Serials.

Membership—4,300 Membership is open to anyone who has an interest in areas covered by ALCTS.

Dues—$65 plus membership in ALA

Meetings—Annual Conference; Chicago, June 27–July 2, 2013, Las Vegas, June 26–July 1, 2014, San Francisco, June 25–30, 2015.

Publications—Library Resources & Technical Services (q.); ALCTS Newsletter Online (q.)

Name of Organization or Association—Association of Specialized and Cooperative Library Agencies

Acronym—ASCLA

Address:
50 E. Huron St.
Chicago, IL
60611
US

Phone Number—312-280-4395; Fax Number—(312)944-8085

Email Contact—ascla@ala.org; URL—http://www.ala.org/ascla

Leaders—Susan Hornung, Executive Director

Description—A division of the American Library Association, the Association of Specialized and Cooperative Library Agencies (ASCLA) enhances the effectiveness of library service by advocating for and providing high-quality networking, enrichment and educational opportunities for its diverse members, who represent state library agencies, libraries serving special populations, library cooperatives, and library consultants.

Membership—700

Dues—You must be a member of ALA to join ASCLA. See http://www.ala.org/membership for most current ALA dues rates. ASCLA individual membership: $52; organization membership: $60; State Library Agency dues: $500.

Meetings—ASCLA meets in conjunction with the American Library Association.

Publications—Interface, quarterly online newsletter; see website http://www.ala.org/ascla for list of other publications.

Name of Organization or Association—Canadian Library Association/Association canadienne des bibliothèques

Acronym—CLA

Address:
1150 Morrison Drive, Suite 400
Ottawa, ON
K2H 8S9
Canada

Phone Number—(613)232-9625; Fax Number—(613)563-9895

Email Contact—info@cla.ca; URL—http://www.cla.ca

Leaders—Linda Sawden Harris, Manager of Financial Services; Judy Green, Manager, Marketing & Communications; Kelly Moore, Executive Director

Description—Our Mission The Canadian Library Association/Association canadienne des bibliothèques is the national public voice for Canada's library communities. We champion library values and the value of libraries. We influence public policy impacting libraries. We inspire and support learning. We collaborate to strengthen the library community.

Membership—The CLA membership consists of a diverse group of individuals and organizations involved or interested in library or information sciences. A large proportion of CLA Members work in college, university, public, special (corporate, nonprofit, and government), and school libraries. Others sit on the boards of public libraries, work for companies that provide goods and services to libraries, or are students in graduate level or community college programs. Membership categories of the Canadian Library Association include: Personal, Institutional, Associate, and Trustee. Total membership at September 11, 2012 was 3987.

Dues—$25–$1,000

Meetings—CLA 2013 National Conference and Trade Show—Winnipeg, MB—Winnipeg Convention Centre: May 29–June 1, 2013

Publications—Feliciter Online Magazine—6× year

Name of Organization or Association—Computer Assisted Language Instruction Consortium

Acronym—CALICO

Address:
214 Centennial Hall, Texas State University, 601 University Dr.
San Marcos, TX
78666
US

Phone Number—(512)245-1417; Fax Number—(512)245-9089

Email Contact—info@calico.org; URL—http://calico.org

Leaders—Esther Horn, Manager

Description—CALICO is devoted to the dissemination of information on the application of technology to language teaching and language learning.

Membership—1,000 members from the United States and 20 foreign countries. Anyone interested in the development and use of technology in the teaching/learning of foreign languages are invited to join. Members usually come from language teaching fields such as higher education, K-12 education, and even government entities such as the armed services where language learning and teaching are of utmost importance.

Dues—$65 annual/individual

Meetings—2013, University of Hawaii; 2014, University of Ohio, 2015, University of Colorado; 2016, Michigan State University

Publications—CALICO Journal Online (three issues per year), CALICO Monograph Series (Monograph IX, 2010: Web 2.0 topics; Monograph V, second edition 2011: teaching languages with technology topics; Monograph X, 2012: teaching writing with technology topics).

Name of Organization or Association—Consortium of College and University Media Centers

Acronym—CCUMC

Address:
601 E. Kirkwood Ave. Franklin Hall 0009
Bloomington, IN
47405
US

Phone Number—(812)855-6049; Fax Number—(812)855-2103

Email Contact—ccumc@ccumc.org; URL—http://www.ccumc.org

Leaders—Aileen Scales, Executive Director

Description—CCUMC is a professional group whose mission is to provide leadership and a forum for information exchange to the providers of media content, academic technology, and support for quality teaching and learning at institutions of higher education. Fosters cooperative media/instructional technology-related support in higher education institutions and companies providing related products. Gathers and disseminates information on improved procedures and new developments in instructional technology and media center management.

Membership—750 individuals at 325 institutions/corporations: Institutional Memberships—Individuals within an institution of higher education who are associated with the support to instruction and presentation technologies in a media center and/or technology support service. Corporate Memberships—Individuals within a corporation, firm, foundation, or other commercial or philanthropic enterprise whose business or activity is in support of the purposes and objectives of CCUMC. Associate Memberships—Individuals not eligible for an Institutional or Corporate membership; from a public library, religious, governmental, or other organizations not otherwise eligible for other categories of membership. Student Memberships—Any student in an institution of higher education who is not eligible for an institutional membership.

Dues—Institutional or Corporate Membership: $325 for 1–2 persons, $545 for 3–4 persons, $795 for 5–6 persons, $130 each additional person beyond six Associate Membership: $325 per person Student Membership: $55 per person

Meetings—2010 Conference, Buffalo New York (October 6–10, 2010); 2011 Conference South Padre Island Texas (October 5–9, 2011)

Publications—College & University Media Review (journal—annual) Leader (newsletter—3 issues annually)

Name of Organization or Association—Education Development Center, Inc.

Acronym—EDC

Address:
43 Foundry Avenue
Waltham, MA
02453-8313
US

Phone Number—(617)969-7100; Fax Number—(617)969-5979

Email Contact—emarshall@edc.org; URL—http://www.edc.org

Leaders—Dr. Luther S. Luedtke, President and CEO

Description—EDC is a global nonprofit organization that designs, delivers, and evaluates innovative programs to address some of the world's most urgent challenges in education, health, and economic opportunity. Working with public sector and private partners, we harness the power of people and systems to improve education, health promotion and care, workforce preparation, communications technologies, and civic engagement. EDC conducts 250 projects in 23 countries around the world.

Membership—Not applicable

Dues—Not applicable

Meetings—Not applicable

Publications—(1) Annual Report (2) EDC Update, monthly e-newsletter (3) Detailed website with vast archive of publications, technical reports, and evaluation studies.

Name of Organization or Association—Education Northwest (formerly Northwest Regional Educational Laboratory)

Acronym—N/A

Address:
101 SW Main St., Suite 500
Portland, OR
97204
US

Phone Number—(503)275-9500; Fax Number—503-275-0448

Email Contact—info@educationnorthwest.org; URL—http://educationnorthwest.org

Leaders—Steve Fleischman, CEO

Description—Chartered in the Pacific Northwest in 1966 as Northwest Regional Educational Laboratory, Education Northwest now conducts more than 200 projects annually, working with schools, districts, and communities across the country on comprehensive, research-based solutions to the challenges they face. At Education Northwest, we are dedicated to and passionate about learning. Through our work, we strive to create vibrant learning environments where all youth and adults can succeed. Everything we do is evidence-based, giving us a solid foundation upon which we stand with confidence. We work with teachers, administrators, policymakers, and communities to identify needs, evaluate programs, and develop new solutions. The breadth of our work—ranging from training teachers, to developing curriculum, to restructuring schools, to evaluating programs—allows us to take a comprehensive look at education and to bring wide-ranging expertise and creativity to our clients' challenges. Our approach is highly customized to meet the needs of our clients, and our staff members take great pride in working closely with customers in the field to design the right approach for each situation. We are proud of our 40-year track record, but we don't rest on our laurels—instead, we strive constantly to identify and address emerging needs and trends in teaching and learning

Membership—921 organizations

Dues—None

Meetings—Annual meeting of membership

Publications—Education Northwest Magazine (quarterly journal)

Name of Organization or Association—Educational Communications, Inc., Environmental, Media and Cultural Projects of

Acronym—

Address:
P.O. Box 351419
Los Angeles, CA
90035
US

Phone Number—(310)559-9160; Fax Number—(310)559-9160

Email Contact—ECNP@aol.com; URL—http://www.ecoprojects.org

Leaders—Nancy Pearlman, Executive Director and Executive Producer

Description—Educational Communications is dedicated to enhancing the quality of life on this planet and provides radio and television programs about the environment and cultural documentaries. Serves as a clearinghouse on ecological issues through the Ecology Center of Southern California. Programming is available on 75 stations in 25 states and the Internet. These include: ECONEWS television series and ENVIRONMENTAL DIRECTIONS radio series. Provides ethnic folk dance performances through Earth Cultures. Assists groups in third-world countries through Humanity and the Planet, especially "Wells for Burkina Faso" and "Environmental Education in Kenya." Services provided include ethnic folk dance performances, a speaker's bureau, award-winning public service announcements, radio and television documentaries, volunteer and intern opportunities, and input into the decision-making process. Its mission is to educate the public about both the problems and the solutions in the environment. Other projects include Project Ecotourism, Environmental Resources Library, and more

Membership—$20.00 for yearly subscription to the Compendium Newsletter

Dues—$20 for regular. All donations accepted

Meetings—as needed

Publications—Compendium Newsletter (bi-monthly newsletter) "Culturally Speaking" Newsletter on website Environmental Directions radio audio cassettes, (1,750 produced to date) ECONEWS and ECO-TRAVEL television series (over 550 shows in the catalog available on 3/4″, VHS, and DVD)

Name of Organization or Association—ENC Learning Inc.

Acronym—ENC

Address:
8000 Walton Pkwy
New Albany, OH
43054
US

Phone Number—800-471-1045; Fax Number—877-656-0315

Email Contact—info@goenc.com; URL—http://www.goenc.com

Leaders—Dr. Len Simutis, Director

Description—ENC provides K-12 teachers and other educators with a central source of information on mathematics and science curriculum materials, particularly those that support education reform. Among ENCs products and services is ENC Focus, a free online magazine on topics of interest to math and science educators. Users include K-12 teachers, other educators, policymakers, and parents.

Membership—ENC is a subscription-based online resource for K-12 educators. Subscriptions are available for schools, school districts, college and universities, and individuals. Information for subscribers is available at http://www.goenc.com/subscribe

Dues—None

Meetings—None

Publications—ENC Focus is available as an online publication in two formats: ENC Focus on K-12 Mathematics, and ENC Focus on K-12 Science. Each is accessible via http://www.goenc.com/focus

Name of Organization or Association—Health and Sciences Communications Association

Acronym—HeSCA

Address:
P.O. Box 31323
Omaha, NE
68132
US

Phone Number—402-915-5373; Fax Number—none

Email Contact—hesca.office@gmail.com; URL—http://www.hesca.org/

Leaders—Chuck Lenosky, Executive Director

Description—The Health and Science Communications Association is an association of communications professionals committed to sharing knowledge and resources in the health and science arenas. The foundation for our network is built upon our unique membership which has created opportunities for unlimited exchange of information and support. International in scope and diverse in membership, HeSCA is supported by medical and veterinary schools, hospitals, medical associations, universities, and businesses where media are used to create and disseminate health and science information.

Membership—150.

Dues—Free. Join our group on LinkedIn.

Meetings—Annual meetings, May–June.

Publications—Journal of Visual Communications in Medicine; Feedback (newsletter)

Name of Organization or Association—Lister Hill National Center for Biomedical Communications

Acronym—LHNCBC

Address:
US National Library of Medicine, 8600 Rockville Pike
Bethesda, MD
20894
US

Phone Number—(301)496-4441; Fax Number—(301)402-0118

Email Contact—lhcques@lhc.nlm.nih.gov; URL—http://lhncbc.nlm.nih.gov/

Leaders—Clement J. McDonald, MD, Director, ClemMcDonald@mail.nih.gov

Description—The Lister Hill National Center for Biomedical Communications is an intramural research and development division of the US National Library of Medicine (NLM). The Center conducts and supports research and development in the dissemination of high-quality imagery, medical language processing, high-speed access to biomedical information, intelligent database systems development, multimedia visualization, knowledge management, data mining, and machine-assisted indexing.

Membership—None

Dues—None

Meetings—None

Publications—Fact sheet (and helpful links to other publications) at: http://www.nlm.nih.gov/pubs/factsheets/lister_hill.html Fellowship and PostDoctoral opportunities are ongoing: http://lhncbc.nlm.nih.gov/lhc/servlet/Turbine/template/training%2CTrainingoppor.vm

Name of Organization or Association—Medical Library Association

Acronym—MLA

Address:
65 E. Wacker Pl., Ste. 1900
Chicago, IL
60601-7246
US

Phone Number—(312)419-9094; Fax Number—(312)419-8950

Email Contact—info@mlahq.org; URL—http://www.mlanet.org

Leaders—Carla J. Funk, MLS, MBA, CAE, Executive Director

Description—MLA, a nonprofit, educational organization, comprises health sciences information professionals with 4,000 members worldwide. Through its programs and services, MLA provides lifelong educational opportunities, supports a knowledgebase of health information research, and works with a global network of partners to promote the importance of quality information for improved health to the health care community and the public.

Membership—Membership categories: Regular Lower Salary/Regular Membership Institutional Membership International Membership Affiliate Membership Student Membership

Dues—$120/$195, regular lower salary/regular; $130, introductory; $295–695, institutional, based on total library expenditures, including salaries, but excluding grants and contracts; $130, international; $120, affiliate; $50, student

Meetings—National annual meeting held every May; most chapter meetings are held in the fall.

Publications—MLA News (newsletter, 10/yr.); Journal of the Medical Library Association (quarterly scholarly publication.); MLA DocKit series, collections of representative, unedited library documents from a variety of institutions that illustrate the range of approaches to health sciences library management topics); MLA BibKits, selective, annotated bibliographies of discrete subject areas in the health sciences literature; standards; surveys; and co-published monographs. Books co-published by ALA Editions.

Name of Organization or Association—Mid-continent Research for Education and Learning

Acronym—McREL

Address:
4601 DTC Blvd., Suite 500
Denver, CO
80237
US

Phone Number—(303)337-0990; Fax Number—(303)337-3005

Email Contact—info@mcrel.org; URL—http://www.mcrel.org

Leaders—Dr. Timothy Waters, CEO

Description—McREL is a private, nonprofit organization devoted to improving education through applied research and development. McREL provides a variety of research-based products and services for K-12 educators to promote the best instructional practices in the classroom. Additionally, McREL manages the North Central Comprehensive Center, serving the states of Nebraska, North Dakota, South Dakota, and Wyoming. The center, which is funded by the U.S. Department of Education, provides training and technical assistance to state education agencies in implementing and administering programs under the Elementary and Secondary Education Act. McREL also manages the Pacific Regional Education Lab, connecting educators in Hawaii, American Samoa, Guam, the Commonwealth of the Northern Mariana Islands, the Federated States of Micronesia, the Republic of the Marshall Islands, and the Republic of Palau with research on teacher effectiveness, family and community engagement, college and career readiness, and more. McREL has particular expertise in standards-based education systems, leadership for school improvement, effective instructional practices in the classroom, teacher quality, mathematics and science education improvement, early literacy development, and education outreach programs.

Membership—not a membership organization

Dues—no dues

Meetings—NA

Publications—Changing Schools (q. newsletter), plus numerous technical reports and other publications. Check website for current listings.

Name of Organization or Association—Minorities in Media (an affiliate of the Association for Educational Communications & Technology)

Acronym—MIM

Address:
119 Hofstra University
New York, NY
11549
US

Phone Number—(516) 463-5086; Fax Number—(516) 463-6196

Email Contact—roberto.joseph@hofstra.edu; URL—http://aectmim.webs.com/

Leaders—Roberto Joseph, President (2011–2013); Camille Dickson-Deane, President Elect (2011–2013)

Description—MISSION STATEMENT: Minorities in Media's purpose is to encourage the effective utilization of educational media in the teaching learning process; provide leadership opportunities in advancing the use of technology as an integral part of the learning process; provide a vehicle through which minorities might influence the utilization of media in institutions; develop an information exchange network common to minorities in media; study, evaluate, and refine the educational technology process as it relates to the education of minorities and to encourage and improve the production of effective materials for the education of minorities.

Membership—Dr. Wesley Joseph McJulien founded Minorities In Media (MIM) around the late 1970s. In the April 1987 issue of Tech Trends, the article Black

Contributors to Educational Technology chronicles the history of MIM. John W. Green & Wesley J. McJulien write: “In 1975, a group of Black technologists met in Dallas in an effort to band together and provide more opportunities for Blacks in the Association for Educational Communications and Technology. One of the assignments was to find the Black person who was the outstanding author in the field of educational technology and invite him to speak at the 1977 meeting of BUDDIES (an organization now called Minorities In Media). Dr. Greene was selected and his presentation, ‘The Role of Blacks in Instructional Technology,’ stressed that Black must participate in all areas of AECT and especially in research (p. 18)” This history is the foundation of who we are today as an organization. We celebrate our past and continue to spearhead our future. Membership is open to professionals and academics whose interests align with MIMs mission.

Dues—$10, student; $30 professional

Meetings—Annual meetings held during the Association for Educational Communications & Technology conference—http://www.aect.org.

Publications—Minorities in Media Website: http://aectmim.webs.com/ Facebook Group: http://www.facebook.com/groups/302061629822972/ Clark, K. (2012). E-Learning and underserved students. In J.A. Banks (Ed.), Encyclopedia of Diversity in Education. Newbury Park, CA: Sage Publications. Clark, K., Brandt, J., Hopkins, R., & Wilhelm, J. (2009). Making games after-school: Participatory game design in non-formal learning environments. Educational Technology, Nov-Dec, pp. 40–44. Eugene, W. & Clark, K. (2012). E-Learning, Engineering and Learners of African Descent: A Needs Analysis. Journal of STEM Education: Innovations and Research, 13(2), 45–57. Eugene, W. and Clark, K. (2009). The Role of Identity and Culture on Website Design. Multicultural Education & Technology Journal, 3(4), p. 256–265. Igoche, D. A., & Branch, R. (2009). Incorporating cultural values into the ADDIE approach to instructional design. Educational Technology, 49(6), 4–8. Joseph, R. & Clark, K. (Eds.) (2009). Culturally relevant technology-based learning environments [Special Issue]. Educational Technology, Nov.-Dec. Joseph, R. (2009). Closing the Achievement Gap with Culturally Relevant Technology-based Learning Environments. Educational Technology 49(6), pp. 45–47. Joseph, R. & Clark, K. (2009). Introduction to Special Issue on Culturally Relevant Technology-Based Learning Environments. Educational Technology 49(6), pp. 3–4. Thomas, M., Mitchell, M. & Joseph, R. (2002). The third dimension of ADDIE: A cultural embrace. Tech Trends, 46(2), pp. 40–45. Young, P. A. (2011). The significance of the Culture-Based Model in designing culturally-aware tutoring systems. AI & Society. 26(1), 35–47. Young, P. A. (2009). Instructional design frameworks and intercultural models. Hershey, PA: IGI Global/Information Science Publishing.

Name of Organization or Association—National Aeronautics and Space Administration

Acronym—NASA

Address:
NASA Headquarters, 300 E Street SW
Washington, DC
20546
US

Phone Number—(202)358-0103; Fax Number—(202)358-3048

Email Contact—education@nasa.gov; URL—http://www.nasa.gov/education

Leaders—Leland Melvin, Assistant Administrator for Education

Description—NASA's journeys into air and space have deepened humankind's understanding of the universe, advanced technology breakthroughs, enhanced air travel safety and security, and expanded the frontiers of scientific research. These accomplishments share a common genesis: education. As the United States begins the second century of flight, the Nation must maintain its commitment to excellence in science, technology, engineering, and mathematics education to ensure that the next generation of Americans can accept the full measure of their roles and responsibilities in shaping the future. NASA will continue the Agency's tradition of investing in the Nation's education programs and supporting the country's educators who play a key role in preparing, inspiring, exciting, encouraging, and nurturing the young minds of today who will be the workforce of tomorrow. In 2012 and beyond, NASA will continue to pursue three major education goals: Strengthening NASA and the Nations future workforce—Attracting and retaining students in science, technology, engineering and mathematics, or STEM, disciplines—Engaging Americans in NASAs mission Learn More @ http://www.nasa.gov/education

Membership—n/a

Dues—n/a

Meetings—n/a

Publications—Publications and Products can be searched and downloaded from the following URL—http://search.nasa.gov/search/edFilterSearch.jsp?empty=true

Name of Organization or Association—National Association of Media and Technology Centers

Acronym—NAMTC

Address:
NAMTC, 7105 First Ave. SW
Cedar Rapids, IA
52405
US

Phone Number—319 654 0608; Fax Number—319 654 0609

Email Contact—bettyge@mchsi.com; URL—http://www.namtc.org

Leaders—Betty Gorsegner Ehlinger, Executive Director

Description—NAMTC is committed to promoting leadership among its membership through networking, advocacy, and support activities that will enhance the equitable access to media, technology, and information services to educational communities. Membership is open to regional, K-12, and higher education media centers which serve K-12 students as well as commercial media and technology centers.

Membership—Institutional and corporate members numbering approximately 200.

Dues—$150 institutions; $360 corporations

Meetings—A national Leadership Summit is held in the winter.

Publications—Electronic NAMTC Newsletter is published five times per academic year.

Name of Organization or Association—National Council of Teachers of English

Acronym—NCTE

Address:
1111W. Kenyon Rd.
Urbana, IL
61801-1096
US

Phone Number—(217)328-3870; Fax Number—(217)328-0977

Email Contact—public_info@ncte.org; URL—http://www.ncte.org

Leaders—Kent Williamson, NCTE Executive Director

Description—The National Council of Teachers of English, with 35,000 individual and institutional members worldwide, is dedicated to improving the teaching and learning of English and the language arts at all levels of education. Among its position statements and publications related to educational media and technology are "Code of Best Practices in Fair Use for Media Literacy Education," "The NCTE Definition of Twenty First Century Literacies," and "Position Statement on Teaching, Learning, and Assessing Writing in Digital Environments."

Membership—NCTE members include elementary, middle, and high school teachers; supervisors of English programs; college and university faculty; teacher educators; local and state agency English specialists; and professionals in related fields.

Dues—Membership in NCTE is $50 a year; subscriptions to its journals is in addition to the membership fee.

Meetings—http://www.ncte.org/annual/ 102nd NCTE Annual Convention, Nov. 15–20, 2012, Las Vegas, NV; 103rd NCTE Annual Convention, Nov. 21–26, 2013, Boston, MA.

Publications—NCTE publishes about 10 books a year. Visit http://www.ncte.org/books and http://www.ncte.org/store. NCTE journals include Language Arts Voices from the Middle English Journal College English College Composition and Communication English Education Research in the Teaching of English Teaching English in the Two-Year College Talking Points English Leadership Quarterly The Council Chronicle (included in NCTE membership) Journal information is available at http://www.ncte.org/journals/

Name of Organization or Association—National EBS Association

Acronym—NEBSA

Address:
PO Box 121475
Clermont, FL
34712-1475
US

Phone Number—(407) 401-4630; Fax Number—(321) 406-0520

Email Contact—execdirector@nebsa.org; URL—https://nebsa.org

Leaders—Lynn Rejniak, Chair, Bd. of Dirs.; Don MacCullough, Exec. Dir.

Description—Established in 1978, NEBSA is a nonprofit, professional organization of Educational Broadband Service (EBS) licensees, applicants, and others interested in EBS broadcasting. EBS is a very high frequency television broadcast service that is used to broadcast distance learning classes, two-way Internet service, wireless and data services to schools, and other locations where education can take place. The goals of the association are to gather and exchange information about EBS, gather data on utilization of EBS, act as a conduit for those seeking EBS information, and assist migration from video broadcast to wireless, broadband Internet services using EBS channels. The NEBSA represents EBS interests to the FCC, technical consultants, and equipment manufacturers. The association uses its website and Listserv list to provide information to its members in areas such as technology, programming content, FCC regulations, excess capacity leasing, and license and application data.

Membership—The current membership consists of Educational Institutions and nonprofit organizations that hold licenses issued by the Federal Communications Commission for Educational Broadband Service (EBS). We also have members that have an interest in EBS and members such as manufacturers of EBS-related equipment and Law firms that represent Licensees.

Dues—We have two main types of memberships: Voting memberships for EBS licensees only, and nonvoting memberships for other educational institutions and sponsors. See the website http://www.nebsa.org for details.

Meetings—Annual Member Conference, April 2nd–5th, 2013 New Orleans, LA

Publications—http://www.nebsa.org

Name of Organization or Association—National Endowment for the Humanities

Acronym—NEH

Address:
Division of Public Programs, Americas Media Makers Program, 1100 Pennsylvania Ave., NW, Room 426
Washington, DC
20506
US

Phone Number—(202)606-8269; Fax Number—(202)606-8557

Email Contact—publicpgms@neh.gov; URL—http://www.neh.gov

Leaders—Karen Mittelman, Director, Division of Public Programs

Description—The NEH is an independent federal grant-making agency that supports research, educational, and public programs grounded in the disciplines of the humanities. The Division of Public Programs Americas Media Makers Program supports film and radio programs in the humanities for public audiences, including children and adults. All programs in the Division of Public Program support various technologies, specifically websites both as stand-alone projects and as extensions of larger projects such as museum exhibitions. The Division of Public Programs has a second film grant program. The Bridging Cultures through Film: International Topics program supports documentary films that examine international and transnational themes in the humanities. These projects are meant to spark Americans' engagement with the broader world by exploring one or more countries and cultures outside of the United States. Proposed documentaries must be analytical and deeply grounded in humanities scholarship.

Membership—Nonprofit institutions and organizations including public television and radio stations.

Dues—not applicable

Meetings—not applicable

Publications—Visit the website (http://www.neh.gov) for application forms and guidelines as well as the Media Log, a cumulative listing of projects funded through the Media Program.

Name of Organization or Association—National Federation of Community Broadcasters

Acronym—NFCB

Address:
1970 Broadway, Ste. 1000
Oakland, CA
94612
US

Phone Number—510 451-8200; Fax Number—510 451-8208

Email Contact—ginnyz@nfcb.org; URL—http://www.nfcb.org.

Leaders—Maxie C Jackson III, President and CEO

Description—NFCB represents noncommercial, community-based radio stations in public policy development at the national level and provides a wide range of practical services, including technical assistance.

Membership—250. Noncommercial community radio stations, related organizations, and individuals.

Dues—range from $200 to $4,000 for participant and associate members

Meetings—Annual Community Radio Conference; 2010 St. Paul; 2011 San Francisco; 2012 Houston; 2013 San Francisco

Publications—Public Radio Legal Handbook; Digital AudioCraft; Guide to Underwriting

Name of Organization or Association—National Freedom of Information Coalition

Acronym—NFOIC

Address:
101 Reynolds Journalism Institute, Missouri School of Journalism
Columbia, MO
65211-0012
US

Phone Number—573.882.4856; Fax Number—573.884.6204

Email Contact—buntingk@missouri.edu; URL—http://www.nfoic.org/

Leaders—Kenneth F. Bunting, Executive Director

Description—The National Freedom of Information Coalition is a national membership organization devoted to protecting the publics right to oversee its government. NFOICs goals include helping start-up FOI organizations; strengthening existing FOI organizations; and developing FOI programs and publications appropriate to the membership.

Membership—The NFOIC offers active memberships to freestanding nonprofit state or regional Freedom of Information Coalitions, academic centers and First Amendment Centers, and associated memberships to individuals and entities supporting NFOICs mission. Membership information is available at http://www.nfoic.org. Achieving and maintaining active membership in all 50 states is the primary goal of NFOIC.

Dues—Membership categories and levels of support are described on the NFOIC Web site.

Meetings—The National Freedom of Information Coalition host an annual meeting and a spring conference.

Publications—The FOI Advocate, a blog on FOI, FOIA, and open government matters. Various other audits and white papers.

Name of Organization or Association—National Gallery of Art

Acronym—NGA

Address:
Department of Education Resources, 2000B South Club Drive
Landover, MD
20785
US

Phone Number—(202)842-6269; Fax Number—(202)842-6935

Email Contact—EdResources@nga.gov; URL—http://www.nga.gov/education/classroom/loanfinder/

Leaders—Leo J. Kasun, Head, Department of Education Resources

Description—This department of NGA is responsible for the production and distribution of 120+ educational audiovisual programs, including interactive technologies. Materials available (all loaned free to individuals, schools, colleges and universities, community organizations, and noncommercial television stations) range from DVDs, CD-Roms, videocassettes, and teaching packets with either image CD-ROMs or color slides. All DVD and videocassette programs are closed captioned A free catalog describing all programs is available upon request. We can also provide multiple copies for inservices or large meetings or conferences. Many of these programs are available for long-term loan.

Membership—Our free-loan lending program resembles that of a library and because we are a federally funded institution we do not have a membership system. Last year we lent programs directly to over one million borrowers. Our programs are available to anyone who requests them which ranges from individuals to institutions.

Dues—None

Meetings—None

Publications—Extension Programs Catalogue.

Name of Organization or Association—National Telemedia Council Inc.

Acronym—NTC

Address:
1922 University Ave.
Madison, WI
53726
USA

Phone Number—(608)218-1182; Fax Number—None

Email Contact—NTelemedia@aol.com; URL—http://www.nationaltelemediacouncil.org, and http://www.journalofmedialiteracy.org

Leaders—Karen Ambrosh, President; Marieli Rowe, Exec. Dir, Rev. Stephen Umhoefer, Treasurer; Kate Vannoy, Secretary, Dr. Martin Rayala, Past President, (plus 9 Board Members).

Description—The National Telemedia Council is a national, nonprofit professional organization that has been promoting a media wise society for nearly six decades. Embracing a positive, nonjudgmental philosophy that values education, evaluation, and reflective judgment, NTC has a long history of a broad array of initiatives that have included annual conferences, workshops, major and innovative interactive forums, local, national and international events for diverse participants (including children); and its major ongoing award, the "Jessie McCanse Award for Individual, Long-Term Contribution to the Field of Media Literacy." NTCs ongoing current activities continue to include its major publication, The Journal of Media Literacy, published up to three times per year (and a part of the organization since its inception in 1953 and earlier); the development of its archival website; and interactive collaborations to advance the field such as the "media literacy cafes" in connection with issues of the Journal of Media Literacy.

Membership—Member/subscribers to the Journal of Media Literacy, currently over 500, including individuals, organizations, schools, and University libraries across the Globe including Asia, Australia, Europe, North and South America. Our membership is open to all those interested in media literacy.

Dues—Individuals: $35, basic; $50, contributing; $100, patron Organizations/Library: $60 Corporate sponsorship: $500 (Additional Postage for Overseas: Canada or Mexico, add $18.00. All other outside North America, add $23.00)

Meetings—No major meetings scheduled this year (2012). For 2013, NTCs sixtieth Anniversary year as a national organization, plans are in development for a series of interactive international, focused collaborative media cafes.

Publications—The Journal of Media Literacy

Name of Organization or Association—Native American Public Telecommunications, Inc.

Acronym—NAPT

Address:
1800 North 33rd Street
Lincoln, NE
68503
US

Phone Number—(402) 472-3522; Fax Number—(402) 472-8675

Email Contact—native@unl.edu; URL—http://www.nativetelecom.org

Leaders—Shirley K. Sneve, Executive Director

Description—Native American Public Telecommunications, Inc. (NAPT), a non-profit 501(c)(3) which receives major funding from the Corporation for Public Broadcasting, shares Native stories with the world through support of the creation, promotion, and distribution of Native media. Founded in 1977, through various media—Public Television, Public Radio, and the Internet—NAPT brings awareness of Indian and Alaska Native issues. NAPT operates VisionMaker, the premier source for quality Native American educational and home videos. All aspects of our programs encourage the involvement of young people to learn more about careers in the media—to be the next generation of storytellers. NAPT is located at the University of Nebraska-Lincoln. NAPT offers student employment, internships, and fellowships. Reaching the general public and the global market is the ultimate goal for the dissemination of Native-produced media.

Membership—No Membership

Dues—None

Meetings—None

Publications—VisionMaker E-Newsletter NAPT General E-Newsletter Producer E-Newsletter Educational Catalog Annual Report Post Viewer Discussion Guides Educational Guides

Name of Organization or Association—New York Festivals

Acronym—NYF

Address:
260 West 39th Street, 10th Floor
New York, NY
10018
USA

Phone Number—212-643-4800; Fax Number—212-643-0170

Email Contact—info@newyorkfestivals.com; URL—http://www.newyorkfestivals.com

Leaders—Rose Anderson, Executive Director

Description—The New York Festivals® International Television & Film Awards recognize the "Worlds Best TV & Films™" in all forms of news, sports, documentary, entertainment programming including telenovelas, webisodes, music videos, business theater, event venue productions, corporate films, feature films, infomercials, promotion spots, openings, and IDs. Now entering its 56th year, the total number of entries continues to grow, now representing over 40 different countries, making the NYF™ Television & Film Awards one of the most well known and widely respected competitions on the globe. The 2013 TV & Film Awards ceremony for The Worlds Best TV & Films will be held in conjunction with The NAB Show in Las Vegas in early April. Eligibility year runs from September 1, 2011 through the final deadline. For more information and fees, plus a full list of categories and the rules and regulations, please visit http://www.newyorkfestivals.com.

Membership—No membership feature. The competition is open to any broadcast and non-broadcast programming including online media production.

Dues—n/a

Meetings—n/a

Publications—Winners are posted on our website at http://www.newyorkfestivals.com

Name of Organization or Association—Pacific Film Archive

Acronym—PFA

Address:
University of California, Berkeley Art Museum and Pacific Film Archive, 2625 Durant Ave.
Berkeley, CA
94720-2250
US

Phone Number—(510)642-1437 (library); (510)642-1412 (general); Fax Number—(510)642-4889

Email Contact—NLG@berkeley.edu; URL—http://www.bampfa.berkeley.edu

Leaders—Susan Oxtoby, Senior Curator of Film; Nancy Goldman, Head, PFA Library and Film Study Center

Description—Sponsors the exhibition, study, and preservation of classic, international, documentary, animated, and avant-garde films. Provides on-site research screenings of films in its collection of over 10,000 titles. Provides access to its collections of books, periodicals, stills, and posters (all materials are non-circulating). Offers BAM/PFA members and University of California, Berkeley, affiliates reference and research services to locate film and video distributors, credits, stock footage, etc. Library hours are 1–5 P.M. Mon.–Thurs. Research screenings are by appointment only and must be scheduled at least 2 weeks in advance; other collections are available for consultation on a drop-in basis during library hours.

Membership—Membership is through our parent organization, the UC Berkeley Art Museum and Pacific Film Archive, and is open to anyone. The BAM/PFA currently has over 3,000 members. Members receive free admission to the Museum; reduced-price tickets to films showing at PFA; access to the PFA Library & Film Study Center; and many other benefits. Applications and more information is available at http://www.bampfa.berkeley.edu/join/

Dues—$50 individuals and nonprofit departments of institutions.

Meetings—none

Publications—BAM/PFA Calendar (6/yr.).

Name of Organization or Association—Pacific Resources for Education and Learning

Acronym—PREL

Address:
900 Fort Street Mall, Suite 1300
Honolulu, HI
96813
US

Phone Number—(808) 441-1300; Fax Number—(808) 441-1385

Email Contact—askprel@prel.org; URL—http://www.prel.org/

Leaders—Sharon Nelson-Barber, Ed.D., President and Chief Executive Officer

Description—Pacific Resources for Education and Learning (PREL) is an independent, nonprofit 501(c)(3) corporation that serves the educational community in the US-affiliated Pacific islands, the continental United States, and countries throughout the world. PREL bridges the gap between research, theory, and practice in education and works collaboratively to provide services that range from curriculum development to assessment and evaluation. PREL serves the Pacific educational community with quality programs and products developed to promote educational excellence. We work throughout school systems, from classroom to administration, and collaborate routinely with governments, communities, and businesses. Above all, we specialize in multicultural and multilingual environments. From direct instruction to professional development to creation of quality educational materials, PREL is committed to ensuring that all students, regardless of circumstance or geographic location, have an equal opportunity to develop a strong academic foundation. PREL brings together in the Center for Information, Communications, and Technology (CICT) an experienced cadre of specialists in website development and design, educational technology, distance and online learning, multimedia production, interactive software development, writing and editing, graphics, and print production. By combining tested pedagogy with leading edge technology, PREL can create learning materials encompassing a wide variety of subject matter and delivery methods. PREL partners with researchers, schools, evaluators, publishers, and leaders in the learning technology industry to develop state-of-the-art learning tools and technology solutions. There are vast disparities across the Pacific when it comes to school resources, technology access, and bandwidth. PREL's goal is to work effectively in any type of setting in which an application is needed. With routine travel and a staff presence throughout the northern Pacific, PREL has resolved to reach underserved communities, determine their needs, and meet their requirements with the appropriate delivery and dissemination methods. Multimedia, Software, and Website conception, design, and delivery have become critical components of many learning programs. Our projects include development of teacher and student resources and resource kits, learning games, software solutions, and complex interactive database design. Distance Learning Content and Delivery extend educational resources to audiences and individuals outside the classroom setting. Distance options both enhance and exponentially increase learning opportunities. The CICT is a premier provider of distance education, integrating curriculum and technology. High-Quality Publications are a PREL hallmark. PREL produces and distributes numerous high-quality publications for educators, including its research compendium, Research into Practice; Pacific Educator magazine; educational books and videos; and briefs and reports on research findings and current topics of interest.

Membership—PREL serves teachers and departments and ministries of education in American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia (Chuuk, Kosrae, Pohnpei, and Yap) Guam, Hawaii, the Republic of the Marshall Islands, and the Republic of Palau. In addition we work with the educational community on the continental United States and countries throughout the world. We are not a membership organization. We are grant funded with grants from the United States Departments of Education, Labor, Health and Human Services, and other federal funding agencies such as the Institute of Museum and Library Services and the National Endowment for the Arts. In addition we have projects in partnership with regional educational institutions. Internationally we have worked with the International Labor Organization and the World Health Organization and are currently working with Save the Children on a US AID project in the Philippines.

Dues—N/A

Meetings—PREL supports the annual Pacific Educational Conference (PEC), held each July.

Publications—Publications are listed on the PREL website at http://ppo.prel.org/. Most are available in both PDF and HTML format. Some recent publications are described below: Focus on Professional Development, A (Research-Based Practices in Early Reading Series) A Focus on Professional Development is the fourth in the Research-Based Practices in Early Reading Series published by the Regional Educational Laboratory (REL) at Pacific Resources for Education and Learning (PREL). Because reading proficiency is fundamental to student achievement across all subjects and grades, the preparation of the teachers and administrators who are responsible for providing early reading instruction is of special importance. This booklet examines what research tells us about professional development and about the role that effective professional development plays in improving both teacher performance and student achievement. http://www.prel.org/products/re_/prodevelopment.pdf (902K) Look and See: Using the Visual Environment as Access to Literacy (Research Brief) This paper describes how the visual environment—what we see when we look—can be used to develop both visual and verbal literacy, including aesthetic appreciation, comprehension, and vocabulary. http://www.prel.org/products/re_/look_see.pdf (1M) Measuring the Effectiveness of Professional Development in Early Literacy: Lessons Learned (Research Brief) This Research Brief focuses on the methodology used to measure professional development (PD) effectiveness. It examines the needs that generated this research, what PREL did to meet those needs, and lessons that have been learned as a result. In particular, it discusses the development of a new instrument designed to measure the quality of PD as it is being delivered. http://www.prel.org/products/re_/effect_of_pd.pdf (730K) Pacific Early Literacy Resource Kit CD-ROM (Early Literacy Learning Resources) The Pacific Early Literacy Resource Kit was developed from PRELs research-based work performed with early literacy teachers in US-affiliated Pacific islands. The contents of the Resource Kit represent information, products, and processes we found beneficial as we worked to support literacy teachers in their efforts to improve student literacy achievement. http://www.prel.org/toolkit/index.htm Research Into Practice 2006 (PREL Compendium) This 86-page volume of PRELs annual research compendium brings together articles detailing research conducted during 2005 by PREL. The six articles in this issue focus on putting research findings to work to improve education. http://www.prel.org/products/pr_/compendium06/tableofcontents.asp

Name of Organization or Association—Research for Better Schools, Inc.

Acronym—RBS

Address:
112 North Broad Street
Philadelphia, PA
19102-1510
US

Phone Number—(215)568-6150; Fax Number—(215)568-7260

Email Contact—info@rbs.org; URL—http://www.rbs.org/

Leaders—Keith M. Kershner Executive Director

Description—Research for Better Schools is a nonprofit education organization that has been providing services to teachers, administrators, and policy makers since 1966. Our mission is to help students achieve high learning standards by supporting improvement efforts in schools and other education environments. The staff are dedicated to and well experienced in providing the array of services that schools, districts, and states need to help their students reach proficient or higher learning standards: (1) technical assistance in improvement efforts; (2) professional development that is required for the successful implementation of more effective curricula, technologies, or instruction; (3) application of research in the design of specific improvement efforts; (4) evaluation of improvement efforts; (5) curriculum implementation and assessment; and (6) effective communication with all members of the school community. RBS has worked with a wide range of clients over the years, representing all levels of the education system, as well as business and community groups.

Membership—There is no membership in Research for Better Schools.

Dues—N/A

Meetings—N/A

Publications—RBS publishes a variety of books and other products designed for educators to use for schools improvement. The catalog for RBS Publications is online (visit our homepage at http://www.rbs.org).

Name of Organization or Association—SEDL

Acronym—SEDL

Address:
4700 Mueller Blvd.
Austin, TX
78723
US

Phone Number—(512) 476-6861; Fax Number—(512) 476-2286

Email Contact—info@sedl.org; URL—http://www.sedl.org

Leaders—Dr. Wesley A. Hoover, Pres. and CEO

Description—SEDL is a private, nonprofit education research, development, and dissemination (RD&D) corporation based in Austin, Texas since 1966. SEDL is committed to the belief that improvement of the educational system to meet the needs of all children requires a strong research base that is tightly linked to practice. SEDL partners with educators, administrators, parents, and policymakers to conduct research and development projects that result in strategies and resources to improve teaching and learning. SEDL also helps partners and clients bridge the gap between research and practice with professional development, technical assistance, and information services tailored to meet their needs. These dissemination activities help SEDL partners interpret and apply research findings based on their individual contexts and experiences. SEDL operates the Southeast Comprehensive Center (SECC) and the Texas Comprehensive Center (TXCC). SECC works closely with the states of Alabama, Georgia, Mississippi, North Carolina, and South Carolina.

SEDL staff assist the SECC states with implementing and scaling up the Common Core State Standards and aligned assessments; creating regional communities of practice addressing young children's school readiness and early school success; and assisting four states with establishing and scaling up performance management systems to monitor the implementation and progress of improvement efforts in low-performing schools. State-specific work includes assisting Alabama in the implementation of Plan 2020, the state's new education reform strategic plan; working with the Georgia Department of Education on the development and implementation of college and career pathways; working with the Mississippi Department of Education to develop a plan for a comprehensive early childhood strategy for the state; supporting North Carolina in developing training, tools, and other resources to support schools in using ACT Program assessment data in organization and planning for instruction; and assisting South Carolina in strengthening their charter school application process and developing charter school startup and leadership training. SECC maintains a website at http://www.secc.org Texas Comprehensive Center (TXCC) focuses on partnering with the Texas Education Agency (TEA) in designing, piloting, and scaling up of both teacher and leader effectiveness systems; developing, testing, and refining an accountability system for educator preparation programs; aligning teacher certification standards to the new Texas college and career readiness standards; facilitating work of two statewide advisory groups focused on school support and family and community engagement; supporting TEA and the Education Service Centers in implementing the Texas Student Data System; and developing a community of practice addressing young children's school readiness and early school success. TXCC maintains a website at http://www.txcc.org SEDL Center on Knowledge Translation for Employment Research (KTER) synthesizes and disseminates existing high-quality research on improving employment outcomes for people with disabilities; conducts original research to identify and test strategies that encourage the use of research among businesses/employers, policymakers, vocational rehabilitation agency staff, and people with disabilities; and trains researchers in using the most effective knowledge translation strategies. The KTER Center develops and implements dissemination, training, and technical assistance activities and provides detailed information about projects and resources at http://www.kter.org/ SEDL operates a new national project, the Center on Knowledge Translation for Disability and Rehabilitation Research, that promotes the use of relevant and high-quality disability and rehabilitation research. SEDL works with National Institute on Disability and Rehabilitation Research (NIDRR) grantees to facilitate the creation of research syntheses and summarizing research through an established procedure called a systematic review with the goal of using existing research to promote more effective practices and better options for people with disabilities. The center also aims to help NIDRR researchers find ways to ensure that disability practitioners use research findings. SEDL works four international partners that are world leaders in improving the visibility and use of research evidence: the Campbell Collaboration, the Cochrane Collaboration, Canadian Institutes of Health Research, and the Evidence for Policy and Practice Information and Coordinating Centre. The Vocational Rehabilitation and Autism Spectrum Disorders project based at SEDL addresses a dual challenge—the increasing numbers of Americans diagnosed with autism spectrum disorders, and the extremely low employment rates among persons with disabilities. Through its research activities, the project aims to generate new knowledge and provide information concerning what works in accessing and maintaining employment placements for people with autism. Through its dissemination activities, the project supports a variety of methods to share information through its website, webcasts, best practice profiles, user-friendly summaries, electronic newsletters, and reports of research available at http://autism.sedl.org

Membership—Not applicable.

Dues—Not applicable.

Meetings—Not applicable

Publications—Newsletters, videos, webcasts, and other relevant presentations and documents are available for free general distribution in print and online on the SEDL website at http://www.sedl.org Topic-specific publications related to education change, education policy, mathematics, language arts, science, and disability research and a publications catalog are available at http://www.sedl.org/pubs on the SEDL website.

Name of Organization or Association—Society of Photo Technologists

Acronym—SPT

Address:
11112S. Spotted Rd.
Cheney, WA
99004
US

Phone Number—800-624-9621 or (509)624-9621; Fax Number—(509)624-5320

Email Contact—cc5@earthlink.net; URL—http://www.spt.info/

Leaders—Chuck Bertone, Executive Director

Description—An organization of photographic equipment repair technicians, which improves and maintains communications between manufacturers and repair shops and technicians. We publish Repair Journals, Newsletters, Parts & Service Directory and Industry Newsletters. We also sponsor SPTNET (a technical email group), Remanufactured parts and residence workshops. Currently our biggest thrust is into Service Adjustment Software, currently featuring Canon models.

Membership—1,000 shops and manufactures worldwide, eligible people or businesses are any who are involved full or part time in the camera repair field.

Dues—\$125.00–\$370. Membership depends on the size/volume of the business. Most one man shops are Class A/\$195 dues. Those not involved full time in the field is \$125.00/Associate Class.

Meetings—SPT Journal; SPT Parts and Services Directory; SPT Newsletter; SPT Manuals—Training and Manufacturer's Tours.

Publications—Journals and Newsletters

There are a total of 40 organizations in the database.

Part V
Graduate Programs

Chapter 16
Introduction

Michael Orey

Part five includes annotated entries for graduate programs that offer degrees in the fields of learning, design and technology, or library and information science. In an effort to only list active organizations, I deleted all programs that had not updated their information since 2011. All readers are encouraged to contact the institutions that are not listed for investigation and possible inclusion in the 2014 edition.

Information for this section was obtained through e-mail directing each program to an individual web form through which the updated information could be submitted electronically into a database created by Michael Orey. Although the section editor made every effort to contact and follow-up with program representatives, responding to the annual request for an update was the responsibility of the program representatives. The editing team would like to thank those respondents who helped assure the currency and accuracy of this section by responding to the request for an update. In this year's edition, I asked for some data on numbers of graduates, number of faculty, and amount of grants and contracts. These data were used as self-report top 20 lists in the preface to this book. Readers should be aware that these data are only as accurate as the person who filled the form for their program.

M. Orey (✉)
Learning, Design, and Technology Program, The University of Georgia, Athens, GA, USA
e-mail: mikeorey@uga.edu

M. Orey et al. (eds.), *Educational Media and Technology Yearbook*, Educational Media and Technology Yearbook 38, DOI 10.1007/978-3-319-06314-0_16,

Chapter 17
Worldwide List of Graduate Programs in Learning, Design, Technology, Information, or Libraries

Michael Orey

Name of Institution—Athabasca University

Name of Department or Program—Centre for Distance Education

Address:
1 University Drive
Athabasca, AB
T9S 3A3
Canada

Phone Number—1-780-675-6426 Fax Number—1-780-675-6170

Email Contact—martic@athabascau.ca URL—cde.athabascau.ca

Contact Person—Marti Cleveland-Innes

Specializations—Doctor of Education in Distance Education Master of Education in Distance Education Post-Baccalaureate Diploma in Distance Education Technology Post-Baccalaureate Diploma in Instructional Design Post-Baccalaureate Certificate in Instructional Design Post-Baccalaureate Certificate in Technology-Based Learning

Features—Doctor of Education in Distance Education Master of Education in Distance Education Post-Baccalaureate Diploma in Distance Education Technology Post-Baccalaureate Diploma in Instructional Design Post-Baccalaureate Certificate in Instructional Design Post-Baccalaureate Certificate in Technology-Based Learning

Admission Requirements—Doctorate of Education in Distance Education Admission requirements for the doctoral program include both academic and

M. Orey (✉)
Learning, Design, and Technology Program, The University of Georgia, Athens, GA, USA
e-mail: mikeorey@uga.edu

M. Orey et al. (eds.), *Educational Media and Technology Yearbook*, Educational Media and Technology Yearbook 38, DOI 10.1007/978-3-319-06314-0_17,

experiential elements. * Completion of a masters degree, preferably with a thesis or research project, in a relevant field or area of study (e.g., education or distance education, psychology or educational psychology, instructional technology, adult education, curriculum and instruction, and the like) from a recognized university, normally with a GPA of at least 3.7 or 85 % (Graduate Grading Policy); * Significant experience in open or distance learning, which demonstrates that the student is capable of study at a distance, and of completing high-quality original research with distance supervision only. Master of Education in Distance Education Applicants to the MDE program must hold a baccalaureate degree from a recognized post-secondary education institution. If the potential applicant does not have a degree, but believes his or her education and experience is equivalent to an undergraduate degree, then it is the responsibility of the applicant to put forward this position in writing as part of the application process. Post-Baccalaureate Diploma in Distance Education Technology Applicants to the program must hold a baccalaureate degree from a recognized post-secondary education institution. If the potential applicant does not have a degree, but believes that his or her education and experience is equivalent to an undergraduate degree, then it is the responsibility of the applicant to put forward this position in writing as part of the application process. Post-Baccalaureate Diploma in Instructional Design Applicants to the program must hold a baccalaureate degree from a recognized post-secondary education institution. If the potential applicant does not have a degree, but believes that his or her education and experience is equivalent to an undergraduate degree, then it is the responsibility of the applicant to put forward this position in writing as part of the application process. Post-Baccalaureate Certificate in Instructional Design Applicants to the program must hold a baccalaureate degree from a recognized post-secondary education institution. If the potential applicant does not have a degree, but believes that his or her education and experience is equivalent to an undergraduate degree, then it is the responsibility of the applicant to put forward this position in writing as part of the application process.

Degree Requirements—Doctor of Education in Distance Education. The Doctor of Education in Distance Education program will address the needs of a wide range of practitioners, scholars, and researchers who operate in the distance education arena. The doctorate will provide critical direction as distance education evolves and expands. The primary goal of the doctoral program is to provide students with a complete and rigorous preparation to assume senior responsibilities for planning, teaching, directing, designing, implementing, evaluating, researching, and managing distance education programs. Master of Education in Distance Education, Athabasca University. Master of Education in Distance Education program is designed to provide a common base of skills, knowledge, and values regarding distance education and training, independent of any special area of interest. Post-Baccalaureate Diploma in Distance Education Technology, Athabasca University. Post-Baccalaureate Diploma in Distance Education Technology is a focused, 18-credit (six courses) program designed to provide a solid grounding in the current principles and practices of technology use in distance education and training. The program structure and course content emphasize the concepts and skills required of practitioners who are employed as instructors, teachers, trainers, decision makers, planners, managers, and administrators in distance education or "virtual" programs. The emphasis of the program is on the user of technology for the preparation, delivery, and management of instruction. Post-Baccalaureate Diploma in Instructional Design. The Post-Baccalaureate Diploma in Instructional Design is an 18-credit program that comprises six (6) courses. For those who wish to pursue instructional design as a profession, this Diploma program provides more depth and breadth than the certificate. Post-Baccalaureate Certificate in Instructional Design. The Post-Baccalaureate Certificate in Instructional Design is a 9-credit program, comprising three (3) courses. For those wanting to enhance their instructional design expertise, the Certificate program is an expedient way to obtain the appropriate skills and knowledge.

Number of Full Time Faculty—10; Number of Other Faculty—19

Degrees awarded in 2011–2012 Academic Year—Masters—38; PhD—3; Other—10

Name of Institution—University of Calgary

Name of Department or Program—Office of Graduate Programs, Faculty of Education

Address:
Education Tower 114, 2500 University Drive NW, University of Calgary
Calgary, AB
T2N 1N4
Canada

Phone Number—1-403-220-5675 Fax Number—1-403-282-3005

Email Contact—jvlock@ucalgary.ca URL—http://ucalgary.ca/gpe/

Contact Person—Dr. Jennifer Lock

Specializations—In a knowledge-based economy, the Ph.D., Ed.D., M.A., and M.Ed. programs in the Educational Technology specialization in Educational Research at the University of Calgary have proven valuable to public and private sector researchers, post-secondary faculty, school teachers and school leaders, military/industrial trainers, health educators, instructional designers, managers, and leaders. A spectrum of entrepreneurs and educational experts have successfully completed our graduate programs in educational technology and are using their research, knowledge, and competencies in schools, in higher education, and a range of corporate and private workplaces today. Our graduates have careers as practitioners and scholars in the top government, industry, K-12, and higher education institutions as professors, education and training leaders, teachers and instructors—worldwide. Your academic and professional career growth is possible through our innovative, student-centered programs and supervision processes in this growing, vibrant area. Degree programs can be completed on campus, in blended formats or completely online.

Features—The Educational Technology Specialization is interdisciplinary and is addressed to at least two audiences: (a) Post-secondary teachers and leaders, and school leaders and classroom teachers who are interested in the study and practice of educational technology to facilitate learning or who are interested in technology leadership positions or who are interested in academic careers in higher education; (b) Those who are interested in instructional design and development in settings both within and outside elementary/secondary/tertiary schools, e.g., instructional developers and faculty developers in colleges, institutes of technology and universities, military/industrial trainers, health educators, and private training consultants. Graduate students in the educational technology specialization have the opportunity to investigate a broad spectrum of knowledge building, participatory cultures, instructional design, and development theories and practices as they apply to current and emergent technologies and to explore new directions in instructional design and development and evaluation as they emerge in the literature and in practice.

Admission Requirements—The Master of Education (M.Ed.) is a course-based professional degree. The M.Ed. program is available in online formats. Admission requirements normally include a completed 4-year bachelors degree and a 3.0 GPA. The Master of Arts (M.A.) is a thesis-based degree with a residency requirement that is intended to prepare students for further research. Admission requirements normally include a completed 4-year bachelors degree and a 3.3 GPA. The Doctor of Education (Ed.D.) is a thesis-based degree intended to prepare scholars of the profession for careers in leadership and teaching. The EDD program is available in the online format. Admission requirements normally include a completed Masters Degree and a 3.5 GPA. The Doctor of Philosophy (Ph.D.) is a thesis-based degree with a residency requirement intended to prepare scholars of the discipline for careers in research and teaching. The Ph.D. program is available for full-time, on-campus engagement in apprenticeship. Admission requirements normally include a completed Masters Thesis and a 3.5 GPA.

Degree Requirements—Program requirements for the Master of Education (M.Ed.) program are completion of a minimum of six full-course equivalents (12 half-courses). In Educational Technology, Master of Education students complete 7 half-courses in the specialization of educational technology and 5 half-courses in educational research methodology and action research. The Master of Education cohort-based degree consists of a total of 36 credits (12 half-courses). Graduate students are required to complete their courses in a prescribed sequence. Students are expected to complete all program requirements within 2 years. Program requirements for the Master of Arts (M.A.) thesis program include: (a) two 600-level half-courses in research methods; (b) a non-credit research seminar; (c) 6 half-courses from the Technology Specialization consisting of the following: EDER 679.31 and EDER 671; 4 half-courses selected from the Technology course offering: and any additional courses as determined by the supervisor in consultation with the student; (d) A Masters thesis and an oral examination on the thesis. The Education Doctorate (EDD) in Educational Technology is a 3-year cohort-based program consisting of: (a) Course work (b) Candidacy examination (c) Dissertation Year 1—is designed primarily to develop students' competencies as "critical consumers of educational research" and skills to conduct practitioner-inquiry. As outlined within the program to which the student has applied, first year students must complete: (a) two half-courses in research: EDER 701.06, and either EDER 701.07 or EDER 701.08 (b) two half-courses in the students specialization area Year 2—is designed to engage students in an in-depth analysis of an identified problem of practice through diverse academic disciplines (e.g., leadership, adult learning, etc.). Specialization course-work exposes students to context-specific best practices and cutting edge research and emphasizes the application of theory and research to practice within collaboratories of practice. As outlined within the program to which the student has applied, students must complete: (a) two half-courses in the students specialization area (b) two specialization collaboratories of practice half-courses (c) comprehensive candidacy examination Year 3—is designed to support students in synthesizing their Year 2 inquiry projects into a dissertation. Students work collaboratively with faculty and practitioners from their field to complete a dissertation that addresses a contemporary issue in education. As outlined within the program to which the student has applied, students must complete: (a) Dissertation Seminar I (b) Dissertation Seminar II (c) Doctoral Dissertation Program requirements for the on-campus Doctor of Philosophy (Ph.D.) program include: (a) Three 600- or 700-level half-courses in research methods (specific courses are listed from which students select in conjunction with supervisor) (b) In addition, Ph.D. students in the Educational Technology specialization are required to complete EDER 771 and two half-courses at the 700 level in technology. (c) Candidacy examination (d) Dissertation.

Number of Full Time Faculty—6; Number of Other Faculty—72

Degrees awarded in 2011–2012 Academic Year—Masters—250; PhD—15; Other—15

Name of Institution—University of British Columbia

Name of Department or Program—Master of Educational Technology degree program

Address:
1304-2125 Main Mall
Vancouver, BC
V6T 1Z4
Canada

Phone Number—1-888-492-1122 Fax Number—1-604-822-2015

Email Contact—info@met.ubc.ca URL—http://met.ubc.ca

Contact Person—David Roy

Specializations—This innovative online program provides an excellent environment in which to learn the techniques of instructional design including the development and management of programs for international and intercultural populations.

Attracting students from more than 30 countries, the program provides a unique opportunity to learn and collaborate with professionals and colleagues from around the world. The MET curriculum is designed for K-12 teachers, college and university faculty, course designers, adult and industry educators.

Features—MET fully online graduate degree. MET Graduate Certificate in Technology-Based Distributed Learning. MET Graduate Certificate in Technology-Based Learning for Schools.

Admission Requirements—Please see website.

Degree Requirements—Masters Program: 10 courses Graduate Certificates: 5 courses

Number of Full Time Faculty—9; Number of Other Faculty—8

Degrees awarded in 2011–2012 Academic Year—Masters—74; PhD—0; Other—0

Name of Institution—University of New Brunswick

Name of Department or Program—Faculty of Education

Address:
PO Box 4400
Fredericton, NB
E3B 5A3
Canada

Phone Number—506-452-6125 Fax Number—506-453-3569

Email Contact—erose@unb.ca URL—http://www.unbf.ca/education/

Contact Person—Dr. Ellen Rose

Specializations—Courses are offered in instructional design theories and processes, cultural studies in instructional design, instructional design processes, needs assessment, designing constructivist learning environments, instructional message design, and instructional design for online learning. In addition, students are allowed to take other courses in the Faculty of Education or other applicable areas.

Features—Students can choose the course, project, or thesis stream. UNBs M.Ed. in Instructional Design is very flexible, allowing students to customize their own learning experiences in order to meet their particular learning outcomes. While this is not an online program, several of the Instructional Design courses, and many other relevant courses in the Faculty of Education, are available online.

Admission Requirements—Applicants must have an undergraduate degree in Education or a relevant field, a grade point average of at least 3.0 (B, or its equivalent), and at least 1 year of teaching or related professional experience. Applicants whose first language is not English must submit evidence of their proficiency in the use of the English language. The minimum proficiency levels accepted by the

Faculty of Education are scores of 650 on the TOEFL (280 computer-based) and 5.5 on the TWE.

Degree Requirements—Course route: 10 3-credit hour courses; Project route: 8 3-credit hour courses and one project/report; Thesis route: 5 3-credit hour courses and one thesis; Required courses: ED 6221 Instructional Design Theories and ED 6902 Introduction to Research in Education

Number of Full Time Faculty—1; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—5; PhD—0; Other—0

Name of Institution—University of Saskatchewan

Name of Department or Program—Educational Technology and Design

Address:
28 Campus Drive, College of Education
Saskatoon, SK
S7N 0X1
Canada

Phone Number—306-966-7558 Fax Number—306-966-7658

Email Contact—jay.wilson@usask.ca URL—http://www.etad.ca

Contact Person—Jay R. Wilson

Specializations—We offer a general educational technology degree, but with a particular emphasis on instructional design in all coursework.

Features—Almost all of our courses are delivered in flexible formats. Courses can be taken completely online or blended with classroom experiences. A few courses are only offered face-to-face, but an entire program can be taken online. Many of our courses emphasize authentic learning options, where students work on projects with clients.

Admission Requirements—A professional Bachelors degree or the equivalent of a 4-year Bachelor of Arts. Normally, we require a minimum of 1 year of practical experience in education or a related field. An average of 70 % in your most recent 60 credit units of university coursework.

Degree Requirements—M.Ed. (course-based) students need to complete 30 credit units of graduate-level coursework for the degree. M.Ed. (project) students require 24 credit units of graduate-level coursework and the project seminar (ETAD 992.6) supervised by a faculty member in the program. M.Ed. (thesis) students need to complete 21 units of graduate-level coursework and a thesis supervised by a faculty member in the program and a committee.

Number of Full Time Faculty—4; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—17; PhD—0; Other—0

Name of Institution—The University of Hong Kong

Name of Department or Program—Faculty of Education

Address:
Pokfulam Road
Hong Kong, x
x
China

Phone Number—852 2241 5450 Fax Number—852 2517 0075

Email Contact—mite@cite.hku.hk URL—http://web.edu.hku.hk/programme/mite/

Contact Person—Dr. Lu Jingyan

Specializations—The Master of Science in Information Technology in Education [MSc(ITE)] program offers the following three specialist strands: E-leadership—E-learning—Learning technology design

Features—The program aims to provide—an investigation into Web 2.0, mobile learning, and other emerging learning and teaching technology applications—an opportunity to apply technology in learning and teaching—an opportunity to work in technology-rich learning environment—an exploration of the cultural, administrative, theoretical, and practical implications of technology in education—an introduction to research in technology for education—an opportunity for those wishing to develop leadership capabilities in the use of technology in education

Admission Requirements—Applicants should normally hold a recognized Bachelor's Degree with honors or qualifications of equivalent standard. Applicants may be required to sit for a qualifying examination.

Degree Requirements—To complete the following modules in 1-year full-time study or no more than 4 years of part-time studies: 3 core modules—2 modules from a specialist strand plus either of the following: 0 Independent project and 2 elective modules; or 0 Dissertation

Number of Full Time Faculty—20; Number of Other Faculty—90

Degrees awarded in 2011–2012 Academic Year—Masters—0; PhD—0; Other—0

Name of Institution—Andong National University

Name of Department or Program—Department of Educational Technology, College of Education

Address:
1375 Kyungdong St. (Songchun-dong)
Andong, Kyungbuk
760-749
Korea

Phone Number—+82-54-820-5580, 5585 Fax Number—+82-54-820-7653

Email Contact—ycyang@andong.ac.kr URL—http://home.andong.ac.kr/edutech/

Contact Person—Dr. Yong-Chil Yang

Specializations—Instruction Systems Design and e-HRD major for Master Degree Educational Technology major for Ph.D.

Features—* Only Department supported by Ministry of Education in Korea * B.A., M.A., and Ph.D, programs are offered * Established in 1996 * Inexpensive tuition and living expenses * Small class size * Edutech, ANU Edutech, Educational Technology

Admission Requirements—English or Korean language

Degree Requirements—B.A. degree for M.A. degree in Education for Ph.D.

Number of Full Time Faculty—5; Number of Other Faculty—10

Degrees awarded in 2011–2012 Academic Year—Masters—5; PhD—3; Other—16

Name of Institution—Universiti Sains Malaysia

Name of Department or Program—Centre for Instructional Technology and Multimedia

Address:
Centre for Instructional Tech and Multimedia, Universiti Sains Malaysia
Minden, Pg
11800
Malaysia

Phone Number—604-6533222 Fax Number—604-6576749

Email Contact—marimuthu@usm.my URL—http://www.ptpm.usm.my

Contact Person—Mr. Marimuthu P Ratnam

Specializations—Instructional Design Web/Internet Instruction and Learning Educational Training/Resource Management Instructional and Training Technology/Evaluation Instructional System Development Design and Development of Multimedia/Video/Training materials Constructivism in Instructional Technology E-Learning Systems, Learning Management Systems Digital Audio and Video Production Mobile Learning Persuasive Technology in Instructional Design

Features—(1) Masters in Instructional Multimedia (coursework mode)—entering its ninth academic year 2012–2013—Full-time—1–2 years, Part-time—2–4 years. (2) Master of Arts—Instructional Technology (Research mode) (3) Ph.D.—Instructional Technology (Research mode) Consultancy—services on the application of educational/Instructional Design technology in teaching and learning Training and Diffusion, Continuing Education in support of Life Long Learning Academic Support Services—services to support research, teaching and learning activities and centers within the University

Admission Requirements—Bachelors and Masters degree from accredited institution or relevant work experience

Degree Requirements—Part-time/Full-time

Number of Full Time Faculty—12; Number of Other Faculty—0

Degrees awarded in 2011–2012 Academic Year—Masters—19; PhD—4; Other—0

Name of Institution—Taganrog State Pedagogical Institute

Name of Department or Program—Media Education (Social Pedagogic Faculty)

Address:
Iniciativnaya, 48
Taganrog, –
347936
Russia

Phone Number—(8634)601753 Fax Number—(8634)605397

Email Contact—tgpi@mail.ru URL—http://www.tgpi.ru

Contact Person—Prof. Dr. Alexander Fedorov

Specializations—Media Education, Media Literacy, Media Competence

Features—no

Admission Requirements—Varies per year, please see http://www.tgpi.ru

Degree Requirements—admission after high school (for B.A.) and B.A. or M.A. for Ph.D. level

Number of Full Time Faculty—10; Number of Other Faculty—20

Degrees awarded in 2011–2012 Academic Year—Masters—0; PhD—1; Other—25

Name of Institution—Keimyung University

Name of Department or Program—Department of Education

Address:
1095 Dalgubeldaro
Dalseogu, Daegu
704-701
South Korea

Phone Number—82-53-580-5962

Email Contact—weom@kmu.ac.kr

Contact Person—Wooyong Eom

Specializations—x

Features—x

Admission Requirements—x

Degree Requirements—x

Number of Full Time Faculty—9; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—9; PhD—1; Other—0

Name of Institution—Utrecht University

Name of Department or Program—Educational Sciences

Address:
Heidelberglaan 1
Utrecht, xx
3581RW
The Netherlands

Phone Number—+31302534931 Fax Number—+31302534300

Email Contact—p.p.m.leseman@uu.nl URL—http://www.uu.nl/NL/Informatie/master/edsci/Pages/study.aspx

Contact Person—Paul Leseman, Ph.D.

Specializations—The 2-year (120 EC) program concentrates on the theory, use and effects of innovative teaching and learning arrangements aimed at meaningful, enjoyable learning through the application of different theories, paradigms, and media. Research projects use both experimental design based, and longitudinal approaches and combine qualitative and quantitative analyses of interaction processes and learning products in different teaching and/or learning environments.

Features—The program combines high-level coursework with hands-on research skill and competence development. Students take courses on various theories of learning, instruction, and teaching, and are trained in advanced research techniques and statistical methods to study the design and effectiveness of innovative teaching and learning arrangements. Research seminars help students develop their academic skills. Participation in a senior faculty member's research project introduces each student to "hands-on" research. Throughout the program, various electronic learning environments are used to support students in their collaborative study assignments, and to allow them to experiment with these innovative learning and instruction tools. The program offers a systematic theoretical and empirical analysis of educational phenomena and problems. It emphasizes three goals. Helping students develop: (1) A strong foundation in research and in theories of learning, instruction, and teaching. (2) Competence in conducting high-quality educational research. (3) Capacities and skills to apply basic knowledge and specific research methods from various domains to the study of learning in interaction in education.

The program concludes with writing a Master's thesis in the form of a draft research article for international publication.

Admission Requirements—Applicants should hold a B.A. or B.Sc. in one of the relevant social or behavioral sciences (such as education, psychology, cognitive science, informatics, artificial intelligence) or in a domain relevant to teaching in schools (e.g., math, science, linguistics, history). It is required of applicants to have successfully completed several undergraduate courses on statistics in order to have a basic knowledge of multivariate analysis at the beginning of their first semester. There is a summer school for students who do not meet this requirement. Students meeting the above criteria who have a GPA of at least 2.85 (Dutch equivalent: 7.0) are encouraged to apply for admission. Students will be selected on the basis of their Grade Point Average (GPA), an essay on their motivation and their recommendations; in some cases, an intake interview will also be conducted. All courses are taught in English; therefore all students are required to provide proof of their English language proficiency. Examples of accepted minimum English language test scores: TOEFL paper: 580 TOEFL computer: 237 TOEFL Internet: 93.

Degree Requirements—Completion of all courses and thesis

Number of Full Time Faculty—12; Number of Other Faculty—7

Degrees awarded in 2011–2012 Academic Year—Masters—100; PhD—5; Other—0

Name of Institution—Middle East Technical University

Name of Department or Program—Computer Education & Instructional Technology

Address:
Inonu Bulvari
Ankara, Cankaya
06800
Turkey

Phone Number—+90-3122104193 Fax Number—+90-3122107986

Email Contact—myozden@metu.edu.tr URL—http://www.ceit.metu.edu.tr

Contact Person—M. Yasar OZDEN

Specializations—Computer education, instructional technology

Features—x

Admission Requirements—x

Degree Requirements—x

Number of Full Time Faculty—20; Number of Other Faculty—40

Degrees awarded in 2011–2012 Academic Year—Masters—5; PhD—10; Other—0

Name of Institution—Hacettepe University

Name of Department or Program—Computer Education and Instructional Technology

Address:
Faculty of Education, Hacettepe University, Beytepe
Ankara, Turkey
06800
Turkey

Phone Number—+90-312-2977176 Fax Number—+90-312-2977176

Email Contact—altunar@hacettepe.edu.tr URL—http://www.ebit.hacettepe.edu.tr/

Contact Person—Arif Altun

Specializations—The CEIT department has been established in 1998. Innovations and improvements in technology have changed so many things in people's life. There have been huge improvements in terms of diffusion of information. Computers continue to make an ever increasing impact on all aspects of education from primary school to university and in the growing areas of open and distance learning. In addition, the knowledge and skills related to computers have become essential for everybody in the information age. However, at all levels in society there is a huge need for qualified personnel equipped with the skills that help them to be successful in their personal and professional life. The department aims to train students (prospective teachers) who would teach computer courses in K-12 institutions. It also provides individuals with professional skills in the development, organization, and application of resources for the solution of instructional problems within schools.

Features—The department has M.S. and Ph.D. programs. The research areas are: Learning objects and ontologies, diffusion of innovation, computerized testing, e-learning environments, design, development, and assessment.

Admission Requirements—B.S. in education or computer-related fields

Degree Requirements—B.S.

Number of Full Time Faculty—10; Number of Other Faculty—14

Degrees awarded in 2011–2012 Academic Year—Masters—16; PhD—4; Other—0

Name of Institution—Anadolu University

Name of Department or Program—Computer Education and Instructional Technology

Address:
Faculty of Education
Eskisehir, x
26470
Turkey

Phone Number—00902223350580/3519 Fax Number—00902223350579

Email Contact—fodabasi@anadolu.edu.tr URL—http://www.anadolu.edu.tr/akademik/fak_egt/bilgveogrttekegt/eindex.htm

Contact Person—Prof. Dr. H. Ferhan Odabasi

Specializations—The basic aim of the department is to equip students, with up-to-date knowledge about computer and other information technologies, required for K-12 computer teachers. Graduated students of the department can be employed in public or private schools of The Ministry of National Education, as teachers, instructional technologists, or academicians in the universities. The department offers Bachelor, Master, and Doctorate programs. Both department staff and students collaborate with international schools in terms of teaching and research through exchange programs. Some of the themes, having been studied by academic staff of the department, are: computer-assisted instruction, computer-assisted language instruction, educational technology, computer use in education and school systems, effects of technology on individuals, computer anxiety, industrial design, using the Internet in education, instructional design, instructional software design, statistics, professional development, ICT action competence, technology integration into education, technology integration into special education, safe Internet use, cyber-bullying and digital storytelling, mobile learning.

Features—Computer Education and Instructional Technologies Department has two computer labs. Technical properties of the computers in both of the labs are up to date. In addition, students can use the main library which is around 100 m to department building. Students may reach many books and journals about computers and instructional technologies and have access to various data bases and electronic journals. There is a non-smoking cafeteria for students in the faculty building where they can find snacks, sandwiches, hot and cold drinks. There is also a small room for the smokers. There is a main student cafeteria for students on the campus. There are also fast food restaurants on the campus.

Admission Requirements—High School Diploma plus required scores from the Student Selection Examination administered by Student Selection and Placement Centre and successful completion of qualification examinations. For foreign students, High School Diploma plus required scores from the Foreign Student Examination and successful completion of qualification examinations. Associate Degree plus placement by Student Selection and Placement Centre according to the score obtained in the Student Selection Examination and the students preferences. In addition, may apply to masters or doctorate programs in any field or proficiency in fine arts programs. May apply to bachelors degree completion programs in related fields of study in Distance Education System.

Degree Requirements—For bachelor degree, students are selected by Student Selection and Placement Center according to the students' scores in the Student Selection Exam. About 50 students are admitted to the department each year. The duration of the program is 4 years. Students must pass all courses and obtain a minimum GPA (Grade Point Average) of 2.00 before they can graduate. The official language of instruction is Turkish. Students who want to learn English can attend a 1-year English preparatory school before taking the department courses. The students are required to take courses and prepare and defend a thesis based on their research. It takes approximately 2 years to complete the Master degree. The doctorate degree requires course work and research. The students will conduct original research and prepare a dissertation, then make an oral defense of their completed research. Students require about 4 years beyond the Masters degree to complete a doctorate program.

Number of Full Time Faculty—10; Number of Other Faculty—16

Degrees awarded in 2011–2012 Academic Year—Masters—0; PhD—4; Other—0

Name of Institution—The University of Arizona

Name of Department or Program—University of Arizona South, Educational Technology Program

Address:
Science & Technology Park 9040S Rita Road, Suite 2260
Tucson, AZ
85747
United States

Phone Number—520-626-9381 Fax Number—520-626-1794

Email Contact—bcozkan@email.arizona.edu URL—http://edtech.arizona.edu/content/welcome

Contact Person—Dr. Betul Özkan-Czerkawski

Specializations—Ph.D. Minor in Educational Technology; Masters of Science in Educational Technology; Graduate Certificate in Instructional Design and Technology; Undergraduate Minor in Educational Technology

Features—Fully online

Admission Requirements—Satisfy the admission standards of the UA Graduate College and the Educational Technology Program, including: A completed bachelors degree (in the last 60 credit hours) or masters program from an accredited institution with an overall Grade Point Average (GPA) of 3.0 on a 4.0 scale; A completed application form, along with copies of all undergraduate and graduate transcripts and payment of Graduate College application fees; Three letters of recommendation dated within 6 months of the date of application and written by professionals who are in a position to address the applicant's ability to succeed at the graduate level; A completed student information form that includes a brief statement of long-range professional goals and a 500-word summary on a topic relating to educational technology. Ph.D. Minor Admission Requirements: Ph.D. Minor: Minimum Credit Hours: 9 Core Courses: Only the Ph.D. students at the University of Arizona can minor in Educational Technology and take any course listed for the M.S. in Educational Technology Program. However, students should contact the Program Director first to set up their Plan of Study before taking any courses. More information is at: http://edtech.arizona.edu/content/phd-minor Graduate Certificate in Instructional Design and Technology Admission Requirements: A bachelor's degree from an accredited institution with an overall Grade Point Average (GPA) of 2.0 on a 4.0 scale; A completed application form, along with copies of undergraduate transcripts and payment of Graduate College application fees; One letter of recommendation dated within 6 months of the date of application and written by professionals who are in a position to address the applicant's ability to succeed at the graduate level.

Degree Requirements—M.S. in Educational Technology: The masters degree program of study is developed in consultation with a faculty advisor and requires a minimum of 36 units of graduate courses, with at least 24 of these units taken in Educational Technology. The choices within the program of study are based on professional aspirations, scholastic needs, and personal preferences. For completion, the master's degree program requires development of a best-works portfolio. Ph.D. Minor: This program requires minimum of 9 credit/units. Graduate Certificate in Instructional Design and Technology: This program requires 15 credit/units. Undergraduate Minor in Educational Technology: The minor program of study is developed in consultation with an academic advisor and requires a minimum of 18 units of undergraduate courses.

Number of Full Time Faculty—2; Number of Other Faculty—6

Degrees awarded in 2011–2012 Academic Year—Masters—12; PhD—0; Other—4

Name of Institution—The Ohio State University

Name of Department or Program—Cultural Foundations, Technology, & Qualitative Inquiry

Address:
29W. Woodruff Dr
Columbus, OH
43210
United States

Phone Number—(614)688-4007

Email Contact—voithofer.2@osu.edu URL—http://ehe.osu.edu/epl/academics/cftqi/technology.cfm

Contact Person—Rick Voithofer

Specializations—The technology area in CFTQI offers both M.A. and Ph.D. degrees. This interdisciplinary educational technology program focuses on intersections of learning, technology, and culture in formal and informal education and in society at large. Some of the settings addressed in the program include K-12 environments, distance education, e-learning, online education, higher education, urban education, private and non-profit organizations, museums, and community-based organizations and programs. Students in the program are exposed to a variety of technologies and media including educational multimedia, computer-based instruction, pod/video casts, blogs and wikis, educational games, web-based instruction, video, and electronic portfolios. Recent areas of focus studied by faculty and students include: Educational technology, digital divides, and diverse populations Implications of Web 2.0 technologies for education Education and globalization Online educational research Education Policy and Technology Visual Culture and Visual Media Multiliteracies, learning, and technology Games and Simulations Technology, virtuality, and student identities. Students in this area integrate theoretical and practical studies of technologies and media through pedagogical, social, cultural, economic, historical and political inquiry and critique, in addition to the production of educational media and cultural artifacts.

Features—http://www.facebook.com/pages/Ohio-State-University-Educational-Technology-Program/138548946182406

Admission Requirements—Please see: http://ehe.osu.edu/epl/academics/cftqi/

Degree Requirements—Please see: http://ehe.osu.edu/epl/academics/cftqi/degree-requirements.php

Number of Full Time Faculty—3; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—10; PhD—5; Other—20

Name of Institution—WIDENER UNIVERSITY

Name of Department or Program—Instructional Technology

Address:
One UNIVERSITY PLACE
Media, pa
19013
United States

Phone Number—610-499-4256

Email Contact—kabowes@Widener.Edu URL—http://www.educator.widener.edu

Contact Person—Dr. Kathleen A. Bowes

Specializations—Instructional Technology, Educational Leadership

Features—Wideners Instructional Technology program has three branches: (1) Masters of Education in Instructional Technology. (2) Instructional Technology Specialist Certification (PA non-teaching certificate). (3) Doctor of School Administration with an Instructional Technology Tract Most courses are hybrids.

Admission Requirements—3.0 undergraduate, MATs three letters of recommendation, writing sample

Degree Requirements—undergraduate degree

Number of Full Time Faculty—1; Number of Other Faculty—4

Degrees awarded in 2011–2012 Academic Year—Masters—0; PhD—0; Other—2

Name of Institution—University of Central Arkansas

Name of Department or Program—Leadership Studies

Address:
201 Donaghey
Conway, AR
72035
US

Phone Number—(501)450-5430 Fax Number—(501)852-2826

Email Contact—steph@uca.edu URL—http://www.coe.uca.edu/

Contact Person—Stephanie Huffman, Program Director of the Library Media and Information Technologies Program

Specializations—M.S. in Library Media and Information Technologies is a School Library Media program

Features—Facebook page

Admission Requirements—transcripts, GRE scores, and a copy of the candidates teaching certificate

Degree Requirements—36 semester hours, practicum (for School Library Media), and a professional portfolio

Number of Full Time Faculty—4; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—40; PhD—0; Other—20

Name of Institution—Arizona State University; Educational Technology programs

Name of Department or Program—Division of Educational Leadership and Innovation; Mary Lou Fulton Teachers College

Address:
Box 871811
Tempe, AZ
85287-1811
US

Phone Number—480-965-3225; (480) 965-4963 Fax Number—480-965-9035

Email Contact—robin.boyle@asu.edu;savenye@asu.edu URL—http://education.asu.edu/programs

Contact Person—Ms. Robin Boyle, Academic and Application Advisor; Dr. Wilhelmina (Willi) Savenye, Professor and Program Leader

Specializations—The Educational Technology programs at Arizona State University offer Graduate Certificates in Instructional and Performance Improvement and in K-12 Online Teaching, an M.Ed. degree and a Ph.D. degree. Programs focus on the design, development, and evaluation of instructional systems and educational technology applications to support learning. (Educational Technology may become a specialization in a new Ph.D. degree: Learning, Literacies, and Technologies, in 2013).

Features—The programs offer courses in a variety of areas such as instructional design technology, media development, technology integration, performance improvement, evaluation, and distance education. The doctoral program emphasizes research using educational technology in applied settings.

Admission Requirements—Requirements for admission to the M.Ed. program include a 4-year undergraduate GPA of 3.0 or above and a score of either 500 or above on verbal section of the GRE or a scaled score of 400 on the MAT. (The GRE may be waived for applicants who have either 3 years of teaching or instructional design work experience.) A score of 550 or above on the paper-based TOEFL (or 213 on the computer-based test or 80 Internet-based test) is also required for students who do not speak English as their first language. Requirements for admission to the Ph.D. program include a 4-year undergraduate GPA of 3.20 or above and a combined score of 1,200 or above on the verbal and quantitative sections of the GRE. A score of 600 or above on the paper-based TOEFL (or 250 on the computer-based test or 100 Internet-based test) is also required for students who do not speak English as their first language.

Degree Requirements—The Graduate Certificate programs require just 15 credit hours, with a mix of required and elective courses. The M.Ed. degree requires completion of a minimum of 30 credit hours including 18 credit hours of required course work and a minimum of 12 credit hours of electives. M.Ed. students complete an Applied Project as their culminating experience. The Ph.D. degree requires a minimum of 84 semester hours beyond the bachelors degree. At least 54 of these hours must be taken at ASU after admission to the program. Ph.D. students must fulfill a residence requirement and are required to be continuously enrolled in the program.

Students also take a comprehensive examination and must satisfy a publication requirement prior to beginning work on their dissertation.

Number of Full Time Faculty—7; Number of Other Faculty—12

Degrees awarded in 2011–2012 Academic Year—Masters—10; PhD—5; Other—5

Name of Institution—California State University at East Bay

Name of Department or Program—Educational Technology Leadership

Address:
25800 Carlos Bee Blvd.
Hayward, CA
94542
US

Phone Number—510-885-2509 Fax Number—510-8854632

Email Contact—bijan.gillani@csueastbay.edu URL—http://edtech.csueastbay.edu

Contact Person—Dr. Bijan Gillani

Specializations—Advances in the field of technology and the explosive growth of the Internet in recent years have revolutionized the way instruction is delivered to students. In parallel with these technological advances, the field of Learning Sciences has made phenomenal contributions to how people learn. For the most part, the advances in these two fields (technology and learning sciences) have gone their separate ways. A synergy of these two fields would enable educators and instructional designers to design and develop more effective educational materials to be transmitted over the Internet. To provide a solution for this synergy, we the Institute of Learning Sciences and Technology focuses on providing a systematic and more intelligent approach to the design of e-learning environments by applying the research findings in the field of Learning Sciences to the design and development of technological environments.

Features—How do people learn? What are learning theories? What are the instructional principles that we can derive from learning theories? How can we apply these instructional principles to the design of meaningful learning with existing and emerging technology? How do we make these principles accessible to faculty who wish to use technology more effectively? How do we develop pedagogically sound learning environments that prepare students to pursue meaningful lifework that has local and global contribution?

Admission Requirements—A completed University Graduate Application (Online Only) Two official copies of each transcript (Mail to the Enrollment Office) Statement of residency (Mail to the Department) A Department Application Form (Mail to the Department) Two letter of recommendations (Mail to the Department). GPA 3.0.

Degree Requirements—(1) Completion of required 24 Units of Core Courses. (2) Completion of 16 units of Elective Courses. (3) Completion of Master Degree Project or Thesis Project. (4) Completion of graduate check list (Online and Forms)

Number of Full Time Faculty—3; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—25; PhD—0; Other—25

Name of Institution—California State University-San Bernardino

Name of Department or Program—Dept. of Science, Mathematics, and Technology Education, Instructional Technology program

Address:
5500 University Parkway
San Bernardino, CA
92407
US

Phone Number—(909)537-5692 Fax Number—(909)537-7040

Email Contact—aleh@csusb.edu URL—http://coe.csusb.edu/programs/instTech/index.htm

Contact Person—Dr. Amy Leh

Specializations—Technology integration, online instruction, instructional design, STEM education

Features—Preparing educators in K-12, corporate, and higher education

Admission Requirements—Bachelors degree, 3.0 GPA, completion of university writing requirement

Degree Requirements—48 units including a Master's project (33 units completed in residence); 3.0 GPA; grades of "C" or better in all courses.

Number of Full Time Faculty—3; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—9; PhD—0; Other—0

Name of Institution—University of Northern Colorado

Name of Department or Program—Educational Technology

Address:
College of Education and Behavioral Sciences
Greeley, CO
80639
US

Phone Number—(970)351-2807 Fax Number—(970)351-1622

Email Contact—james.gall@unco.edu URL—http://www.unco.edu/cebs/edtech

Contact Person—James Gall, Department Chair, Educational Technology

Specializations—M.A. in Educational Technology; Ph.D. in Educational Technology.

Features—The Educational Technology programs are designed to develop knowledge and skills in instructional design and technologies for a variety of learning contexts (K-12, higher education, military training, business/organizational, and international settings).

Admission Requirements—Masters Criteria: Bachelors degree from a regionally accredited college or university and a GPA of 3.00 or better (on a 4.00 scale) on the most recent 60 semester hours of work. Applicants must submit academic transcripts, three letters of recommendations, and a statement of purpose. Applications are reviewed continuously. Doctoral Criteria: Bachelors degree from a regionally accredited college or university, a minimal level of achievement combining GPA and GRE scores (GRE scores must be less than 5 years old). Applicants must submit academic transcripts, current GRE scores, three letters of recommendations, and a statement of purpose. They must also participate in an interview with the faculty. The deadline for applications for programs beginning in the fall is March 1. The deadline for applications for programs beginning in the spring is November 1. Applicants with no or limited English ability can apply for the University Intensive English Program. Under this option, a conditional admission is made to the academic program, but the student first attends English language courses until skilled enough to being the regular course work.

Degree Requirements—M.A. in Educational Technology: 33 credit hours of coursework followed by a comprehensive exam. Ph.D. in Educational Technology: 67 credit hours of coursework followed by a comprehensive exam and an oral defense. An original piece of research must be conducted with both a proposal and dissertation defense.

Number of Full Time Faculty—5; Number of Other Faculty—0

Degrees awarded in 2011–2012 Academic Year—Masters—16; PhD—4; Other—0

Name of Institution—University of Connecticut

Name of Department or Program—Educational Psychology

Address:
249 Glenbrook Rd, Unit-2064
Storrs, CT
06269-2064
US

Phone Number—(860)486-0182 Fax Number—(860)486-0180

Email Contact—myoung@UConn.edu URL—http://www.epsy.uconn.edu/

Contact Person—Michael Young, program coordinator

Specializations—M.A. in Educational Technology (portfolio or thesis options), 1-year partially online Masters (summer, fall, spring, summer), sixth Year certificate in Educational Technology and Ph.D. in Learning Technology. This program is titled UConns 2 Summers M.A. in Learning Technology.

Features—M.A. can be on-campus or 2 summers (on campus) and fall-spring (Online) that can be completed in a year. The Ph.D. emphasis in Learning Technology is a unique program at UConn. It strongly emphasizes Cognitive Science and how technology can be used to enhance the way people think and learn. The Program seeks to provide students with knowledge of theory and applications regarding the use of advanced technology to enhance learning and thinking. Campus facilities include $2 billion twenty-first century UConn enhancement to campus infrastructure, including a new wing to the Neag School of Education. Faculty research interests include interactive video for anchored instruction and situated learning, telecommunications for cognitive apprenticeship, technology-mediated interactivity for learning by design activities, and in cooperation with the National Research Center for Gifted and Talented, research on the use of technology to enhance cooperative learning and the development of gifted performance in all students.

Admission Requirements—admission to the graduate school at UConn, GRE scores (or other evidence of success at the graduate level). Previous experience in a related area of technology, education, or experience in education or training.

Degree Requirements—completion of plan of study coursework, comprehensive exam (portfolio-based with multiple requirements), and completion of an approved dissertation.

Number of Full Time Faculty—2; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—18; PhD—0; Other—0

Name of Institution—George Washington University

Name of Department or Program—Graduate School of Education and Human Development

Address:
2134G Street NW
Washington, District of Columbia
20052
US

Phone Number—(866)-498-3382 Fax Number—(202)994-2145

Email Contact—nmilman@gwu.edu URL—http://www.gwu.edu/~etl

Contact Person—Dr. Natalie Milman, Educational Technology Leadership, Program Coordinator

Specializations—The Educational Technology Leadership program began in 1988. It was one of the first online degree programs in the field. The program offers a high-quality, flexible program rich in knowledge of the field and distance education delivery. The result is an outstanding experience for our students.

M.A. in Education and Human Development with a major in Educational Technology Leadership as well as the following Graduate Certificates:

(1) Instructional Design, (2) Multimedia Development, (3) Leadership in Educational Technology, (4) E-Learning, (5) Training and Educational Technology, (6) Integrating Technology into Education.

Features—https://www.facebook.com/groups/153686921326555/

Admission Requirements—Application fee, transcripts, GRE or MAT scores (50th percentile), two letters of recommendation from academic professionals, computer access, undergraduate degree with 2.75 GPA. No GRE or MAT is required for entry into the Graduate Certificate programs.

Degree Requirements—MASTERS PROGRAM: 36 credit hours (including 27 required hours and 9 elective credit hours). Required courses include computer application management, media and technology application, software implementation and design, public education policy, and quantitative research methods.

GRADUATE CERTIFICATE PROGRAMS: 18 credit hours

Number of Full Time Faculty—3; Number of Other Faculty—0

Degrees awarded in 2011–2012 Academic Year—Masters—24; PhD—0; Other—15

Name of Institution—Florida State University

Name of Department or Program—Educational Psychology and Learning Systems

Address:
3210 Stone Building
Tallahassee, Florida
32306-4453
US

Phone Number—(850)644-4592 Fax Number—(850)644-8776

Email Contact—mmckee@oddl.fsu.edu URL—http://insys.fsu.edu

Contact Person—Mary Kate McKee, Program Coordinator

Specializations—M.S. and Ph.D. in Instructional Systems with specializations for persons planning to work in academia, business, industry, government, or military, both in the United States and in international settings.

Features—Core courses include systems and materials development, performance improvement, online learning, development of multimedia, project management, psychological foundations, current trends in instructional design, and research and statistics. Internships are recommended. Strong alumni network. M.S. courses available both on campus and online.

Admission Requirements—M.S.: 3.0 GPA in last 2 years of undergraduate program, 1,000 GRE (verbal plus quantitative), 550 TOEFL (for international applicants). Ph.D.: 1,100 GRE (V + Q), 3.5 GPA in last 2 years; international students, 550/90 TOEFL.

Degree Requirements—M.S.: 36 semester hours, 2–4 h internship, comprehensive exam preparation of professional portfolio

Number of Full Time Faculty—5; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—37; PhD—8; Other—0

Name of Institution—University of Central Florida

Name of Department or Program—College of Education—ERTL

Address:
4000 Central Florida Blvd.
Orlando, Florida
32816-1250
US

Phone Number—(407) 823-4835 Fax Number—(407) 823-4880

Email Contact—richard.hartshorne@ucf.edu URL—http://www.education.ucf.edu/insttech/

Contact Person—Dr. Atsusi Hirumi, Dr. Glenda Gunter, Dr. Richard Hartshorne

Specializations—Graduate Certificates in (a) Instructional Design of Simulations, (b) Educational Technology, and (c) e-Learning Professional Development. M.A. in Instructional Design and Technology with professional tracks in: (a) Instructional Systems, (b) Educational Technology, and (c) e-Learning, Ph.D. in Education with Instructional Design and Technology track. Ed.D. in Education with Instructional Design & Technology concentration. There are approximately 200 students in M.A. program, 5 in Ed.D. and 15 in Ph.D. programs.

Features—All programs rely heavily on understanding of fundamental competencies as reflected by NCATE, ASTD, AECT, AASL, and ISTE. There is an emphasis on the practical application of theory through intensive hands-on experiences. Orlando and the surrounding area is home to many high-tech companies, military training and simulation organizations, and tourist attractions. UCF, established in 1963, now has in excess of 55,000 students, representing more than 90 countries. It has been ranked as one of the leading “most-wired” universities in North America.

Admission Requirements—GRE score of 1,000 for consideration for doctoral program. No GRE required for M.A. or graduate certificate programs. GPA of 3.0 of greater in last 60 h of undergraduate degree for M.A. program; TOEFL of 550 (270 computer-based version) if English is not first language; three letters of recommendation; resume, statement of goals; residency statement, and health record. Financial statement if coming from overseas.

Degree Requirements—M.A. in Instructional Technology/Instructional Systems, 39 semester hours; M.A. in Instructional Technology/Educational Technology, 39 semester hours, M.A. in Instructional Technology/eLearning, 39 semester hours. Practicum required in all three programs; thesis, research project, or substitute additional course work. Ph.D. and Ed.D. require between 58 and 69 h beyond the masters for completion.

Number of Full Time Faculty—4; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—75; PhD—1; Other—1

Name of Institution—Georgia Southern University

Name of Department or Program—College of Education

Address:
Box 8131
Statesboro, GA
30460-8131
US

Phone Number—(912)478-5307 Fax Number—(912)478-7104.

Email Contact—JRepman@georgiasouthern.edu URL—http://coe.georgiasouthern.edu/eltr/tech/inst_tech/index.htm

Contact Person—Judi Repman. Professor, Dept. of Leadership, Technology, and Human Development

Specializations—Online M.Ed. and GA certification for School Library Media and Instructional Technology Specialists. An online Ed.S. is available in both concentrations as well. The Online Teaching and Learning Endorsement is offered at both levels.

Features—Completely online program. Strong emphasis on technology and use of Web 2.0 tools Online portfolios as culminating program requirement for M.Ed. students http://www.facebook.com/itec.georgiasouthern

Admission Requirements—B.S. (teacher certification NOT required) GRE or MAT not required for applicants who are certified teachers with a 2.5 undergraduate grade point average M.Ed. required for admission to the Ed.S. program

Degree Requirements—36 semester hours for the M.Ed. 30 semester hours for the Ed.S. 9 semester hour Online Teaching and Learning Endorsement

Number of Full Time Faculty—8; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—75; PhD—0; Other—0

Name of Institution—Georgia State University

Name of Department or Program—Middle-Secondary Education and Instructional Technology

Address:
Box 3976
Atlanta, GA
30302-3976
US

Phone Number—(404)413-8060 Fax Number—(404)413-8063

Email Contact—swharmon@gsu.edu. URL—http://edtech.gsu.edu

Contact Person—Dr. Stephen W. Harmon

Specializations—M.S. and Ph.D. in Instructional Design and Technology. Endorsement in Online Teaching and Learning.

Features—Focus on research and practical application of instructional technology in educational and corporate settings. Online M.S. in Instructional Design and Technology available.

Admission Requirements—M.S.: Bachelors degree, 2.5 undergraduate GPA, >40th percentile GRE, 550 TOEFL. Ph.D.: Master's degree, 3.30 graduate GPA, >50th percentile verbal plus >50th percentile quantitative GRE.

Degree Requirements—M.S.: 36 semester hours, internship, portfolio, comprehensive examination. Ph.D.: 60 semester hours, internship, comprehensive examination, dissertation.

Number of Full Time Faculty—5; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—15; PhD—8; Other—0

Name of Institution—University of Georgia

Name of Department or Program—Department of Educational Psychology and Instructional Technology, College of Education

Address:
216 Rivers Crossing
Athens, GA
30602-7144
US

Phone Number—(706)542-4110 Fax Number—(706)542-4032

Email Contact—mikeorey@uga.edu URL—http://ldt.uga.edu/

Contact Person—Dr. Michael Orey, LDT Program Chair

Specializations—M.Ed. and Ed.S. in Learning, Design, and Technology with two emphasis areas: Instructional Design & Development and School Library Media; Ph.D. for leadership positions as specialists in instructional design and development and university faculty. The program offers advanced study for individuals with previous preparation in instructional media and technology, as well as a preparation for personnel in other professional fields requiring a specialty in instructional systems or instructional technology. Representative career fields for graduates include designing new courses, educational multimedia (especially web-based), tutorial programs, and instructional materials in state and local school systems, higher education, business and industry, research and non-profit settings, and in instructional products development.

Features—Minor areas of study available in a variety of other departments. Personalized programs are planned around a common core of courses and include practica, internships, or clinical experiences. Research activities include grant-related activities and applied projects, as well as dissertation studies.

Admission Requirements—All degrees: application to graduate school, satisfactory GRE score, other criteria as outlined in Graduate School Bulletin and on the program website.

Degree Requirements—M.Ed.: 36 semester hours with 3.0 GPA, portfolio with oral exam. Ed.S.: 30 semester hours with 3.0 GPA and project exam. Ph.D.: three full years of study beyond the Master's degree, two consecutive semesters full-time residency, comprehensive exam with oral defense, internship, dissertation with oral defense.

Number of Full Time Faculty—9; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—40; PhD—11; Other—10

Name of Institution—Valdosta State University

Name of Department or Program—Curriculum, Leadership, & Technology

Address:
1500N. Patterson St.
Valdosta, GA
31698
US

Phone Number—(229)333-5633 Fax Number—(229)259-5094

Email Contact—ewiley@valdosta.edu URL—http://www.valdosta.edu/coe/clt/

Contact Person—Ellen W. Wiley

Specializations—M.Ed. in Instructional Technology with two tracks: Library/Media or Technology Applications; Online Ed.S. in Instructional Technology with two tracks: Library/Media or Technology Applications; Ed.D. in Curriculum and Instruction.

Features—The program has a strong emphasis on systematic design and technology in M.Ed., Ed.S., and Ed.D. Strong emphasis on change leadership, reflective practice, applied research in Ed.S and Ed.D.

Admission Requirements—M.Ed.: 2.5 GPA, 800 GRE. Ed.S.: Master's degree, 3 years of experience, 3.0 GPA, 850 GRE, MAT 390 Ed.D.: Masters degree, 3 years of experience, 3.50 GPA, GRE, or MAT accepted.

Degree Requirements—M.Ed.: 33 semester hours. Ed.S.: 27 semester hours. Ed.D.: 54 semester hours.

Number of Full Time Faculty—7; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—16; PhD—0; Other—16

Name of Institution—University of Northern Iowa

Name of Department or Program—Instructional Technology Program

Address:
618 Schinder Education Center
Cedar Falls, IA
50614-0606
US

Phone Number—(319)273-3249 Fax Number—(319)273-5886

Email Contact—leigh.zeitz@uni.edu URL—http://www.uni.edu/itech

Contact Person—Leigh E. Zeitz, Ph.D.

Specializations—M.A. in Curriculum & Instruction: Instructional Technology

Features—The Instructional Technology masters is designed to prepare educators for a variety of professional positions in K-12 and adult learning/corporate educational settings. This is a hands-on program that requires students to apply the theoretical foundations presented in the courses. The UNI Instructional Technology Masters program is available primarily online but some on-campus courses are offered. An online 2-year cohort is initiated during the summer in even numbered years. The programs practical perspective prepares professionals for fulfilling technology leadership roles. On a PK-12 level, these roles include technology coordinators, master teachers, special education media specialists, and county educational specialists. On an adult and corporate level, the roles include instructors at vocational–technical schools, community colleges, and universities. They can work as trainers in the corporate world as well as higher education. Many of our graduates have also become successful instructional designers throughout the country. The masters degree is aligned with the AECT/ECIT standards and is focused on addressing specific career choices.

Admission Requirements—Bachelors degree, 3.0 undergraduate GPA, 500 TOEFL Licensure as a teacher is not required for admission to the masters program. The bachelors degree may be in any field.

Degree Requirements—35 semester credits. Research paper (literature review, project report, journal article, or research report on original research) is required. A thesis option is available. An online digital portfolio will be created by each student to share and reflect upon the students learning experiences in the program.

Number of Full Time Faculty—2; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—21; PhD—1; Other—0

Name of Institution—Boise State University

Name of Department or Program—Instructional & Performance Technology

Address:
1910 University Drive, ENGR-327
Boise, Idaho
83725
US

Phone Number—(208)426-2489;(800)824-7017 ext. 61312 Fax Number—(208) 426-1970

Email Contact—jfenner@boisestate.edu URL—http://ipt.boisestate.edu/

Contact Person—Dr. Don Stepich, IPT Program Chair; Jo Ann Fenner, Manager, Marketing and Outreach Services

Specializations—The Master of Science in Instructional & Performance Technology (IPT) degree is intended to prepare students for careers in the areas of instructional technology, performance technology, instructional design, performance improvement, training, education and training management, e-learning, human resources, organizational development, and human performance consulting. The department also offers three graduate certificate programs in; Human Performance Technology (HPT), Workplace E-Learning and Performance Support (WELPS), and Workplace Instructional Design. The graduate certificates can be earned enroute to the M.S. with the credits eligible for application to the degree.

Features—The IPT students write a monthly column called Tales from the Field in the International Society for Performance Improvements free e-newsletter performance express; http://ipt.boisestate.edu/about-ipt/tales-from-the-field We have a group on LinkedIn called the Instructional & Performance Technology—Network (IPT-N) that individuals are invited to join; http://ipt.boisestate.edu/resources/linkedin

Admission Requirements—undergraduate degree with 3.0 GPA, one-to-two page essay describing why you want to pursue this program and how it will contribute to your personal and professional development, and a resume of personal qualifications and work experience. For more information, visit; http://ipt.boisestate.edu/admission/admission-process

Degree Requirements—36 semester hours in instructional and performance technology and related course work; and two options for a culminating activity; thesis or portfolio defense (included in 36 credit hours).

Number of Full Time Faculty—6; Number of Other Faculty—8

Degrees awarded in 2011–2012 Academic Year—Masters—33; PhD—0; Other—0

Name of Institution—Governors State University

Name of Department or Program—College of Arts and Sciences

Address:
1 University Parkway
University Park, IL
60484
US

Phone Number—(708)534-4051 Fax Number—(708)534-7895

Email Contact—mlanigan@govst.edu URL—http://www.govst.edu/hpt

Contact Person—Mary Lanigan, Associate Prof., Human Performance and Training

Specializations—M.A. in Communication and Training with HP&T major—Program concentrates on building instructional design skills. Most classes are delivered in a hybrid format of online and face to face. Some classes are almost all online.

Features—Instructional Design overview; front-end analysis including both needs and task; design and delivery using various platforms; evaluation skills and how to predict behavior transfer; various technologies; consulting; project management; systems thinking; principles of message design; and more.

Admission Requirements—Undergraduate degree in any field; 2.75 GPA; and, a statement of purpose.

Degree Requirements—36 credit hours. All in instructional and performance technology; internship or advanced field project required. Metropolitan Chicago area based

Number of Full Time Faculty—1; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—10; PhD—0; Other—0

Name of Institution—Southern Illinois University at Carbondale

Name of Department or Program—Department of Curriculum and Instruction

Address:
625 Wham Drive, Mailcode 4610
Carbondale, IL
62901
US

Phone Number—(618) 453-4019 Fax Number—(618) 453-4244

Email Contact—fadde@siu.edu URL—http://lsdt.siuc.edu/

Contact Person—Peter Fadde, Coord., Learning Systems Design and Technology

Specializations—M.S.Ed. in Curriculum & Instruction (with concentration in Learning Systems Design and Technology). Ph.D. in Education (with concentration in Learning Systems Design and Technology)

Features—All specializations are oriented to multiple education settings. The LSDT concentration is designed to prepare students for careers as learning systems designers and learning technologists in higher education, schools, corporations, military, government and non-profit organizations. The masters program focuses on the principles and techniques of creating learning products and multimedia-based online resources for learning, instruction, and education. Courses cover topics including learning theories, systems design, and principles that apply to the design, development, evaluation, and management of learning systems, resources, and technologies. The doctoral program covers the same knowledge base but with an emphasis on research and scholarship.

Admission Requirements—M.S.Ed.: Bachelors degree, 2.7 undergraduate GPA, transcripts. Ph.D.: Masters degree with 3.25 GPA, GRE scores, 3 letters of recommendation, transcripts, writing sample. International students without a degree from a US institution must submit TOEFL score.

Degree Requirements—M.S.Ed., 32 credit hours with thesis; 36 credit hours without thesis. Ph.D., 40 credit hours beyond the masters degree in courses, 24 credit hours for the dissertation.

Number of Full Time Faculty—2; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—8; PhD—3; Other—1

Name of Institution—Southern Illinois University Edwardsville

Name of Department or Program—Instructional Technology Program

Address:
School of Education
Edwardsville, Illinois
62026-1125
US

Phone Number—(618) 650-3277 Fax Number—(618) 650-3808

Email Contact—dknowlt@siue.edu URL—http://www.siue.edu/education/edld/it/it-tech-grad-overview.shtml

Contact Person—Dr. Dave S. Knowlton, Instructional Technology Program Director; Department of Educational Leadership

Specializations—The Educational Technologies option enables teachers and other school personnel to learn how to plan, implement, and evaluate technology-based instruction and learning activities in p-12 settings. Students pursuing this option will become knowledgeable users of technology as well as designers of curriculum and instruction that effectively utilize and integrate technology to improve student learning. Students interested in leadership roles in educational technology, such as those wishing to become technology coordinators in schools or school districts, can work toward meeting the standards for the Illinois State Board of Education's (ISBE) Technology Specialist endorsement through this program. The Library Information Specialist option enables teachers and other school personnel to learn how to plan, implement, and evaluate library information-based activities in P-12 settings. Students pursuing this option will become knowledgeable users of library information as well as designers of curriculum and instruction that effectively utilize and integrate library information to improve student learning. Students interested in Library Information Specialist endorsement can work toward meeting the standards for the Illinois State Board of Education's Library Information Specialist endorsement through this program. The Instructional Design & Performance Improvement option focuses on skills necessary for careers in the areas of instructional design, training, and performance consulting. Emphasis is placed on systematic instructional design and on the use of various media and technologies for learning and instruction. Students in this option may also focus on the design and development of online learning and other performance improvement strategies. The Interactive Multimedia Technologies option is appropriate for people wishing to pursue the design and development of various interactive multimedia and web-based learning experiences. This option prepares students for careers with publishing and production companies, consulting firms, and other businesses that produce engaging multimedia applications for learning and other opportunities. Course work focuses on theories and methods for designing compelling user experiences, developing skills with tools for web and other delivery media, and project management strategies.

Features—Several unique features of the program provide students with opportunities for important practical experiences that complement course work. First, the program is based on an any-time-any-place model, where online, self-paced, and field-based coursework dominates. Second, juried presentations provide students with an opportunity to share their work with a jury of professors and peers, and defend their work in light of their own goals and the content of their degree program. Third, virtual Design Studios provide students with opportunities to work on real-world projects for a variety of real clients in order to develop skills in collaboration, design, development tools and techniques, and project management.

Admission Requirements—The requirements for admission are a bachelor's degree in any discipline and a GPA of 3.0 or above during their last 2 years of undergraduate work.

Degree Requirements—36 semester hours; Thesis or Final Project options.

Number of Full Time Faculty—8; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—10; PhD—0; Other—1

Name of Institution—Western Illinois University

Name of Department or Program—Instructional Design and Technology

Address:
47 Harrabin Hall
Macomb, Illinois
61455
US

Phone Number—(309)298-1952 Fax Number—(309)298-2978

Email Contact—hh-hemphill@wiu.edu URL—http://www.wiu.edu/coehs/idt

Contact Person—Hoyet H. Hemphill, Ph.D., Chair. Ph.D. in Instructional Technology

Specializations—Undergraduate programs B.S degree in Instructional Design and Technology, with an emphasis on corporate instructional design, instructional multimedia and web-based development, animation, online learning, instructional simulations and games, and instructional project management. Undergraduate Minors in: Web Design—Digital Media—Photographic Media Graduate Program M.S. in Instructional Design and Technology (available online) with optional emphasis on K-12 Technology Specialist. Six Post-Baccalaureate Certificates (PBC)—three completely online, including Educational Technology Specialist option.

Features—M.S. program approved by Illinois Board of Higher Education in January 1996 with an emphasis on Instructional Design and Technology, Web Design, Interactive Multimedia, and Distance Education. M.S. can be completed entirely online. M.S. and Post-Baccalaureate Certificate in K-12 Technology Specialist both offered online B.S. in Instructional Design and Technology approved in 1997. Courses are lab-based, hands-on. Emphasis is on instructional design and production in corporate and organizational environment. Undergraduate Minors in: Web Design—Digital Media—Photographic Media

Admission Requirements—M.S.: Bachelor's degree with minimum 2.75 GPA overall or 3.0 for last 2 years. Otherwise, 12 semester hours of graduate work with GPA of 3.2 or higher. English proficiency (TOEFL) for international students.

Degree Requirements—M.S.: 32 semester hours, thesis or applied project, or 35 semester hours with portfolio. Certificate Program in Instructional Technology Specialization. Graphic applications, training development, video production. Each track option is made of 5 courses or a total of 15 semester hours, except for Technology Specialist, which is 24 semester hours. B.S.: 120 h program

Number of Full Time Faculty—8; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—23; PhD—0; Other—10

Name of Institution—Iowa State University

Name of Department or Program—School of Education

Address:
N108 Lagomarcino Hall
Ames, Iowa
50011
US

Phone Number—(515)294-9141 Fax Number—(515)294-2763

Email Contact—dschmidt@iastate.edu URL—http://www.educ.iastate.edu/

Contact Person—Denise Crawford, Director, Center for Technology in Learning and Teaching

Specializations—M.Ed., M.S., and Ph.D. in Curriculum and Instructional Technology. Features: Prepares candidates as practitioners and researchers in the field of curriculum and instructional technology. All areas of specialization emphasize appropriate and effective applications of technology in teacher education. M.Ed. program also offered at a distance (online and face-to-face learning experiences).

Features—Twitter: @ctltisu Graduate Programs: http://www.education.iastate.edu/graduate/

Admission Requirements—Admission Requirements: M.Ed. and M.S.: Bachelors degree, top half of undergraduate class, official transcripts, three letters of reference, autobiography. Ph.D.: top half of undergraduate class, official transcripts, three letters of reference, autobiography, GRE scores, scholarly writing sample.

Degree Requirements—Degree Requirements: M.Ed. 32 credit hours (7 research, 12 foundations, 13 applications and leadership in instructional technology); and action research project. M.S. 33 credit hours (13 research, 12 foundations, 8 applications and leadership in instructional technology); and thesis. Ph.D. 78 credit hours (minimum of 12 research, minimum of 15 foundations, additional core credits in conceptual, technical and advanced specialization areas, minimum of 12 dissertation);portfolio, and dissertation.

Number of Full Time Faculty—5; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—30; PhD—5; Other—0

Name of Institution—Kansas State University

Name of Department or Program—Curriculum & Instruction

Address:
261 Bluemont Hall
Manhattan, KS
66506
US

Phone Number—785-532-5716 Fax Number—785-532-7304

Email Contact—talab@ksu.edu URL—http://coe.ksu.edu/ecdol

Contact Person—Dr. Rosemary Talab

Specializations—The Educational Computing, Design, and Online Learning Program has these specializations: I. M.S. in Curriculum & Instruction with specialties in (1) Educational Computing, Design, and Online Learning (online option) (2) Digital Teaching and Learning (online) II. Ph.D. in Curriculum & Instruction with specialty in Educational Computing, Design, and Online Learning (online) III. KSU Graduate School Certificate in Digital Teaching and Learning IV. KSU Graduate School Certificate in Online Course Design Masters program started in 1982; doctoral in 1987; DTL Certificate in 1999, OCD Certificate in 2012.

Features—All coursework for the Certificates, M.A., and Ph.D. can be taken online. ECDOL is an online program that focuses on research, theory, practice, ethics, and the design of learning environments, with an emphasis on emerging technologies. Coursework includes instructional design, virtual learning environments, game-based learning, the design and evaluation of online courses, etc. Classes are offered regularly on a rotating basis. A cohort group is begun each fall for the Professional Seminar 1 and 2 academic year via videoconferencing, in which major areas of the field (change and ID models, distance education and online learning, etc.) are explored, as well as various delivery methods and technologies. E-portfolios are required at the Certificate and Masters degree levels. The Ph.D. program allows the student to tailor the classes to individual needs. At the Certificate and Masters degree levels the DTL program offers classroom teachers leadership opportunities as technology facilitators and lead teachers, with coursework available in integrating emerging technologies into instruction to improve student achievement through a blend of practical technology skills with research and theory. The Masters degree-level ECDOL program is offered to those who have B.A.s in other fields who wish to pursue a specialty in instructional design or prepare for the Ph.D. in ECDOL or who wish to design instructional environments in online and virtual learning environments. The KSU Graduate School Certificate in Digital Teaching and Learning is a 15-h completely online program for the classroom teacher with uniform exit outcomes and an e-portfolio requirement. The emphasis is on the application of technological and pedagogical theory, knowledge and practical application skills that can be directly translated into the classroom. The ECDOL program, as a whole, is on Twitter (#Proseminar1) and on Facebook (KSUECDOL) http://www.facebook.com/group.php?gid=113228718719613, though the group is private.

Admission Requirements—M.S. in ECDOL: B average in undergraduate work, mid-range scores on TOEFL. M.S./Certificate in DTL: B average in undergraduate work and teaching experience. Ph.D.: B average in undergraduate and graduate work, GRE, three letters of recommendation, experience or basic courses in educational computing.

Degree Requirements—DTL Certificate is 15 h and requires an e-portfolio and technology project OCD Certificate is 14 h and requires a final e-portfolio and an online course/workshop M.S.: 31 semester hours (minimum of 15 in specialty); thesis, internship, or practicum not required, but all three are possible; e-portfolio and project are required. The Ph.D. degree is 36–42 h, with 30 h of research, for a total of 60 h, minimum. Of that, 60 h semester hours are required and 30 h are taken from the students masters program. There is a minimum of 21 h in Educational Computing, Design, and Online Learning or related area approved by committee and 30 h for dissertation research.

Number of Full Time Faculty—1; Number of Other Faculty—6

Degrees awarded in 2011–2012 Academic Year—Masters—7; PhD—3; Other—2

Name of Institution—University of Louisville

Name of Department or Program—Organizational Leadership & Learning

Address:
1905 South 1st Street
Louisville, KY
40292
US

Phone Number—(502)852-6667 Fax Number—(502)852-4563

Email Contact—rod.githens@louisville.edu URL—http://louisville.edu/education/departments/elfh/oll

Contact Person—Rod Githens

Specializations—B.S. in Workforce Leadership (specialization in Training and Development) (100 % online or face-to-face) M.S. in Human Resources &

Organization Development (specialization in Workplace Learning & Performance) (100 % online or face-to-face) M.Ed. in Instructional Technology (please note: this program is offered for educators in P-12 settings through the Department of Teaching and Learning) Ph.D. track in Human Resources and Organization Development

Features—Our program is Relevant, Rigorous, and Research-based: Relevant. The program has a strong emphasis on hands-on, applied projects that provide direct application to the field. Our instructors have practitioner experience in the field and many currently work in HR-related positions in Louisville and around the country—Rigorous. Expect to work hard and complete challenging assignments. Our goal is to help you develop the skills to think unconventionally about conventional problems—Research-based. The program is designed around research-based competencies from the American Society for Training and Development, International Society for Performance Improvement, and the Society for Human Resource Management. Faculty members have strong theoretical and conceptual backgrounds that guide both their teaching and their practical approach to the field.

Admission Requirements—Masters Degree: 3.0 GPA, 800 GRE, 2 letters of recommendation, goal statement, resume Ph.D.: 3.5 GPA, 1,000 GRE, letters of recommendation, goal statement, resume

Degree Requirements—See program websites: B.S. in Workforce Leadership: http://louisville.edu/education/degrees/bs-wl.html M.S. in Human Resource Education: http://louisville.edu/education/degrees/ms-hre.html M.Ed. in Instructional Technology: http://louisville.edu/education/degrees/med-it.html Ph.D. track in Human Resources and Organization Development: http://louisville.edu/education/degrees/phd-elod-hrd.html

Number of Full Time Faculty—11; Number of Other Faculty—14

Degrees awarded in 2011–2012 Academic Year—Masters—25; PhD—5; Other—100

Name of Institution—Fitchburg State University

Name of Department or Program—Division of Graduate and Continuing Education

Address:
160 Pearl Street
Fitchburg, MA
01420
US

Phone Number—(978) 665-3544 Fax Number—(978) 665-3055

Email Contact—rhowe@fitchburgstate.edu URL—http://www.fitchburgstate.edu

Contact Person—Dr. Randy Howe, Chair

Specializations—M.Ed. in Educational Leadership and Management with specialization in Technology Leadership.

Features—Collaborating with professionals working in the field both for organizations and as independent producers, Fitchburg offers a unique M.Ed. program. The objectives are to develop in candidates the knowledge and skills for the effective implementation of technology within business, industry, government, not-for-profit agencies, health services, and education.

Admission Requirements—MAT or GRE scores, official transcript(s) of a baccalaureate degree, two or more years of experience in communications or media or education, three letters of recommendation.

Degree Requirements—39 semester credit hours.

Number of Full Time Faculty—5; Number of Other Faculty—7

Degrees awarded in 2011–2012 Academic Year—Masters—4; PhD—0; Other—0

Name of Institution—Lesley University

Name of Department or Program—Educational Technology

Address:
29 Everett St.
Cambridge, MA
02138-2790
US

Phone Number—(617)349-8419 Fax Number—(617)349-8169

Email Contact—gblakesl@lesley.edu URL—http://www.lesley.edu/soe/111tech.html

Contact Person—Dr. George Blakeslee

Specializations—M.Ed. in Technology in Education CAGS/Ed.S. in Technology in Education Ph.D. in Educational Studies with specialization in Technology in Education

Features—M.Ed. program is offered off-campus at 70+ sites in 21 states; contact 617-349-8311 for information. The degree is also offered completely online. Contact Maureen Yoder, myoder@lesley.edu, or (617)348-8421 for information. Or check our website: url above.

Admission Requirements—Completed bachelors teaching certificate

Degree Requirements—M.Ed.: 33 semester hours in technology, integrative final project in lieu of thesis, no internship or practicum. C.A.G.S.: 36 semester hours. Ph.D. requirements available on request.

Number of Full Time Faculty—11; Number of Other Faculty—70

Degrees awarded in 2011–2012 Academic Year—Masters—225; PhD—11; Other—40

Name of Institution—McDaniel College (formerly Western Maryland College)

Name of Department or Program—Graduate and Professional Studies

Address:
2 College Hill
Westminster, MD
21157
US

Phone Number—(410)857-2507 Fax Number—(410)857-2515

Email Contact—rkerby@mcdaniel.edu URL—http://www.mcdaniel.edu

Contact Person—Dr. Ramona N.Kerby, Coord., School Library Media Program, Graduate Studies

Specializations—M.S. in Education with an emphasis on School Librarianship

Features—School librarianship

Admission Requirements—3.0 Undergraduate GPA, 3 reference checklist forms from principal and other school personnel, acceptable application essay, acceptable Praxis test scores

Degree Requirements—37 credit hours, including professional digital portfolio.

Number of Full Time Faculty—1; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—15; PhD—0; Other—0

Name of Institution—Towson University

Name of Department or Program—College of Education

Address:
Hawkins Hall
Towson, Md
21252
US

Phone Number—(410)704-4226 Fax Number—(410)704-4227

Email Contact—jkenton@towson.edu URL—http://grad.towson.edu/program/master/istc-ms/

Contact Person—Dr. Jeffrey M. Kenton, Assistant Dean—College of Education

Specializations—M.S. degrees in Instructional Development, and Educational Technology (Contact Liyan Song: lsong@towson.edu) M.S. degree in School Library Media (Contact, David Robinson: derobins@towson.edu). Ed.D. degree in Instructional Technology (Contact, William Sadera, bsadera@towson.edu) (http://grad.towson.edu/program/doctoral/istc-edd/)

Features—Excellent labs. Strong practical hands-on classes. Focus of M.S. program—Students produce useful multimedia projects for use in their teaching and training. Many group activities within courses. School library media degree confers with MaryLand State Department of Education certification as a Prek-12 Library Media Specialist. Innovative Ed.D. program with online hybrid courses and strong mix of theory and practical discussions.

Admission Requirements—Bachelor's degree from accredited institution with 3.0 GPA. (Conditional admission granted for many applicants with a GPA over 2.75). Doctoral requirements are listed: http://grad.towson.edu/program/doctoral/istc-edd/ar-istc-edd.asp

Degree Requirements—M.S. degree is 36 graduate semester hours without thesis. Ed.D. is 63 h beyond the M.S. degree.

Number of Full Time Faculty—17; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—180; PhD—5; Other—2

Name of Institution—Eastern Michigan University

Name of Department or Program—Teacher Education

Address:
313 John W. Porter Building
Ypsilanti, MI
48197
US

Phone Number—(734)487-3260 Fax Number—(734)487-2101

Email Contact—tjones1@emich.edu URL—http://www.emich.edu/coe/edmt

Contact Person—Toni Jones, Ph.D.—Professor/Graduate Coordinator

Specializations—M.A. and Graduate Certificate in Educational Media and Technology. The mission of this program is to prepare professionals who are capable of facilitating student learning in a variety of settings. The program is designed to provide students with both the knowledge base and the application skills that are required to use technology effectively in education. Focusing on the design, development, utilization, management, and evaluation of instructional systems moves us toward achieving this mission. Students who complete the educational technology concentration will be able to: (a) provide a rationale for using technology in the educational process; (b) identify contributions of major leaders in the field of educational media technology and instructional theory, and the impact that each leader has had on the field; (c) assess current trends in the area of educational media technology and relate the trends to past events and future implications; (d) integrate technology into instructional programs; (e) teach the operation and various uses of educational technology in instruction; (f) act as consultants/facilitators in educational media technology; (g) design and develop instructional products to meet specified needs; and (h) evaluate the effectiveness of instructional materials and systems.

Features—Courses in our 30 credit hour Educational Media & Technology (EDMT) program include technology and the reflective teacher, technology and student-centered learning, technology enhanced learning environments, issues and emerging technologies, instructional design, development of online materials, psychology of the adult learner, principles of classroom learning, curriculum foundations, research seminar, and seminar in educational technology. Since spring 2003, all of the EDMT courses have been taught online. The program can be completed entirely online. Students who do not want to receive a masters degree may apply for admission to our 20 credit hour Educational Media and Technology certificate. The EDMT courses for the certificate are also offered online. Visit our blog at: http://blogs.emich.edu/edmt/

Admission Requirements—Individuals seeking admission to this program must: (1) Comply with the Graduate School admission requirements. (2) Score 550 or better on the TOEFL and 5 or better on TWE, if a nonnative speaker of English. (3) Have a 2.75 undergraduate grade point average, or a 3.30 grade point average in 12 h or more of work in a masters program. (4) Solicit two letters of reference. (5) Submit a statement of professional goals.

Degree Requirements—In order to graduate, each student is expected to: (1) Complete all work on an approved program of study. (30+ semester hours) (2) Maintain a "B" (3.0 GPA) average or better on course work taken within the program. (3) Get a recommendation from the faculty adviser. (4) Fill out an application for graduation and obtain the advisers recommendation. (5) Meet all other requirements for a masters degree adopted by the Graduate School of Eastern Michigan University. (6) Complete a culminating experience (research, instructional development or evaluation project) as determined by the student and faculty adviser.

Number of Full Time Faculty—4; Number of Other Faculty—0

Degrees awarded in 2011–2012 Academic Year—Masters—16; PhD—0; Other—1

Name of Institution—Michigan State University

Name of Department or Program—College of Education

Address:
620 Farm Lane, Room 509D
East Lansing, MI
48824
US

Phone Number—517-432-7195 Fax Number—517-353-6393

Email Contact—edutech@msu.edu URL—http://edutech.msu.edu

Contact Person—Leigh Wolf

Specializations—M.A. in Educational Technology with Learning, Design, and Technology specialization. Online, overseas and on-campus hybrid options.

Features—@maet on Twitter https://www.facebook.com/MAETMSU on Facebook

Admission Requirements—Please visit: http://edutech.msu.edu/apply

Degree Requirements—30 semester hours, web-based portfolio.

Number of Full Time Faculty—6; Number of Other Faculty—6

Degrees awarded in 2011–2012 Academic Year—Masters—60; PhD—0; Other—0

Name of Institution—Wayne State University

Name of Department or Program—Instructional Technology

Address:
381 Education
Detroit, MI
48202
US

Phone Number—(313)577-1728 Fax Number—(313)577-1693

Email Contact—tspannaus@wayne.edu URL—http://coe.wayne.edu/aos/it/

Contact Person—Timothy W. Spannaus, Ph.D., Program Coord., Instructional Technology Programs, Div. of Administrative and Organizational Studies, College of Education

Specializations—M.Ed. degrees in Instructional Design, Performance Improvement and Training, K-12 Technology Integration, and Interactive Technologies. Ed.D. and Ph.D. programs to prepare individuals for leadership in academic, business, industry, health care, and the K-12 school setting as professor, researcher, instructional design and development specialists; media or learning resources managers or consultants; specialists in instructional video; and web-based instruction and multimedia specialists. The school also offers a 6-year specialist degree program in Instructional Technology. The IT program offers certificates in Online Learning, Educational Technology, and University Teaching.

Features—Guided experiences in instructional design and development activities in business and industry are available. Specific classes use a variety of technologies, including blogs, wikis, twitter, facebook, google docs, and many others. M.Ed. programs are available face-to-face and online. Beginning in January, 2013, we will offer a B.A./B.S. program in Instructional Technology. This is a 2+2 program with Macomb Community College.

Admission Requirements—Ph.D.: Masters degree, 3.5 GPA, GRE, strong academic recommendations, interview.

Degree Requirements—Ph.D. 113 Cr. Hrs, including IT core and electives, research courses, graduate seminars, 30 cr. dissertation. M.Ed.: 33–37 semester hours, including required project; internship recommended.

Number of Full Time Faculty—6; Number of Other Faculty—10

Degrees awarded in 2011–2012 Academic Year—Masters—48; PhD—11; Other—8

Name of Institution—The University of Southern Mississippi

Name of Department or Program—Instructional Technology and Design

Address:
118 College Drive #5057
Hattiesburg, MS
39406-0001
US

Phone Number—601-266-5247 Fax Number—601-266-4548

EmailContact—Taralynn.Hartsell@usm.eduURL—http://www.usm.edu/elementary-special-technology-education

Contact Person—Dr. Taralynn Hartsell

Specializations—The Department of Curriculum, Instruction, and Special Education at The University of Southern Mississippi has two graduate programs relating to Instructional Technology and Design. The Masters of Science in Instructional Technology is a 33–36 h program and the Ph.D. of Instructional Technology and Design is a 54–66 h program. Both programs are hybrid meaning that over 50 % of coursework could be taken online.

Features—The Masters of Science concentrates more on the technology application and integration aspect that helps students learn both hands-on application of technology, as well as theoretical and historical aspects related to the field of study. A majority of the coursework in the program can be completed online (about 70 %), and the remaining coursework are hybrid or blended in nature (about 60 % online and 40 % traditional). The Ph.D. program is an advanced study program for those wishing to pursue their education in the application of technology and design, research, and leadership (established in August, 2009). A majority of the coursework in the program can be completed online (between 60 and 70 % depending upon courses completed) or hybrid (about 50 % online and 50 % traditional). Research core requirements tend to be more traditional in nature.

Admission Requirements—Please review the Department website for more information on the application procedures for each program: http://www.usm.edu/elementary-special-technology-education. The GRE is mandatory for graduate programs. Applications for the university is now completed online: http://www.usm.edu/graduateschool/admissions.php

Degree Requirements—Please review the Department website for more information on degree requirements for each program: http://www.usm.edu/elementary-special-technology-education.

Number of Full Time Faculty—4; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—4; PhD—1; Other—0

Name of Institution—North Carolina State University

Name of Department or Program—Department of Curriculum and Instruction, Instructional Technology Program

Address:
602 Poe Hall, Campus Box 7801
Raleigh, NC
27695-7801
US

Phone Number—(919) 515-6229 Fax Number—(919) 515-6978

Email Contact—kevin_oliver@ncsu.edu URL—http://ced.ncsu.edu/cice/it

Contact Person—Dr. Kevin Oliver, Associate Professor

Specializations—Online M.Ed. and M.S. in Instructional Technology. On-campus Ph.D. in Curriculum and Instruction with a concentration in Instructional Technology. Faculty actively involved in state-level evaluation activities through the Friday Institute for Educational Innovation (e.g., one-to-one computing programs, virtual schooling). Program participating in a cross-university Masters program organized by the state Department of Public Instruction (NC-DPI).

Features—Fully online Masters programs with flexibility for residents near the Raleigh-Durham area to take some on-campus courses if they wish. Doctoral program is not online. A limited number of assistantships are available for students who live near Raleigh, go to school full-time (9 h/semester), and can work on campus 20 h per week. Pays $15–20k per semester with health benefits and tuition remission. Program Facebook group: http://www.facebook.com/groups/329701684366/ Program Twitter feed: http://twitter.com/itncsu Program LinkedIn group: http://www.linkedin.com/groups?gid=2811382

Admission Requirements—Master's: undergraduate degree from an accredited institution, 3.0 GPA in major or in latest graduate degree program; transcripts; GRE or MAT scores; 3 references; goal statement. Ph.D.: undergraduate degree from accredited institution, 3.0 GPA in major or latest graduate program; transcripts; recent GRE scores, writing sample, three references, vita, research and professional goals statement (see http://ced.ncsu.edu/cice/admissions.php).

Degree Requirements—Masters: 30 semester hours (M.Ed.), 36 semester hours (M.S.), thesis required for M.S. program. Ph.D.: 60 h. Up to 12 h of graduate-level transfer credits may be applied to any Masters program if the transfer credits are from Instructional Technology courses similar to those in the program. Transfer credits not accepted for doctoral program—60 new hours required at NC State.

Number of Full Time Faculty—3; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—14; PhD—2; Other—0

Name of Institution—University of Nebraska Kearney

Name of Department or Program—Teacher Education

Address:
1625 West 24th Street
Kearney, NE
68849-5540
US

Phone Number—(308)865-8833 Fax Number—(308)865-8097

Email Contact—fredricksons@unk.edu URL—http://www.unk.edu/academics/ecampus.aspx?id=6217

Contact Person—Dr. Scott Fredrickson, Professor and Chair of the Instructional Technology Graduate Program

Specializations—M.S.Ed in Instructional Technology, Emphasis areas: Instructional Technology, School Library, Information Technology, and Leadership in Instructional Technology

Features—Two main emphasis areas—Instructional Technology, School Library. The Instructional Technology track has an Information Technology endorsement module, a Leadership in Instructional Technology Module, and an Instructional Technology module. The School Library track has a module to obtain a School Library endorsement. To obtain any of the endorsements requires a current teaching certificate; however the degree itself and the classwork in the endorsement areas, do not.

Admission Requirements—Graduate Record Examination or completion of an electronic portfolio meeting department requirements, acceptance into graduate school, and approval of Instructional Technology Advising Committee

Degree Requirements—36 credit hours—18 of which are required and 18 are elective. (30 h are required for the endorsement with 6 h of electives), and a capstone Instructional Technology project.

Number of Full Time Faculty—5; Number of Other Faculty—24

Degrees awarded in 2011–2012 Academic Year—Masters—46; PhD—0; Other—0

Name of Institution—University of Nebraska-Omaha

Name of Department or Program—College of Education Department of Teacher Education

Address:
Roskens Hall 308
Omaha, NE
68182
US

Phone Number—(402)554-2119 Fax Number—(402)554-2125

Email Contact—rpasco@unomaha.edu URL—http://www.unomaha.edu/libraryed/

Contact Person—Dr. Rebecca J. Pasco

Specializations—Undergraduate Library Science Program (school, public, academic, and special libraries) School Library Endorsement (Undergraduate and Graduate) M.S. in Secondary Education with School Library concentration M.S. in Elementary Education with School Library concentration M.S. in Reading with School Library concentration Masters in Library Science Program (Cooperative program with University of Missouri)

Features—Web-assisted format (combination of online and on campus) for both undergraduate and graduate programs. School Library programs nationally recognized by American Association of School Librarians (AASL) Public, Academic and Special Libraries programs Cooperative UNO/University of Missouri MLS program is ALA accredited

Admission Requirements—As per University of Nebraska at Omaha undergraduate and graduate admissions requirements

Degree Requirements—School Library Endorsement (Undergraduate and Graduate)—30 h M.S. in Secondary and Elementary Education with School Library endorsement—36 h M.S. in Reading with School Library endorsement—36 h Masters in Library Science Program (Cooperative program with University of Missouri at Columbia)—42 h

Number of Full Time Faculty—4; Number of Other Faculty—14

Degrees awarded in 2011–2012 Academic Year—Masters—38; PhD—0; Other—16

Name of Institution—Rutgers-The State University of New Jersey

Name of Department or Program—School of Communication and Information

Address:
4 Huntington Street New Brunswick NJ USA
New Brunswick, NJ
08901-1071
US

Phone Number—(732)932-7500 Ext 8264 Fax Number—(732)932-2644

Email Contact—kcassell@rutgers.edu URL—http://www.comminfo.rutgers.edu/

Contact Person—Dr. Kay Cassell, Director, Master of Library and Information Science, Dept. of Library and Information Studies, School of Communication, Information and Library Studies. (732)932-7500 Ext 8955. Fax (732)932-2644. Dr. Michael Lesk, Chair

Specializations—The Master of Library and Information Science (M.L.I.S.) program provides professional education for a wide variety of service and management careers in libraries, information agencies, the information industry, and in business, industry, government, research, and similar environments where information is a vital resource. Specializations include: school library media; services for children and youth; digital libraries; information retrieval/information systems; knowledge management; social media (http://comminfo.rutgers.edu/master-of-library-and-information-science/curriculum-overview.html)

Features—The M.L.I.S. program, available both on campus and online, is organized around six themes in the field of library and information science: human–information interaction; information access; information and society; information systems; management; and organization of information. Six lead courses, one in each area, form the foundation of the curriculum and offer general knowledge of the major principles and issues of the field. Two or more central courses in each theme offer basic understanding and competencies in important components of the field. Specialization courses in each theme allow students to develop expertise in preparation for specific career objectives. The specialization in School Librarianship is certified with the NJ Department of Education. All students in the New Brunswick M.L.I.S. program work with an advisor to plan a course of study appropriate for their interests and career objectives.

Admission Requirements—A bachelors degree or its equivalent from a recognized institution of higher education with a B average or better; GRE scores; Personal statement which presents a view of the library and information science profession and applicant's aspirations and goals in the library and information science professions; 3 Letters of recommendation which focus on the applicant's academic capacity to undertake a rigorous program of graduate study.

Degree Requirements—A minimum of 36 credits, or 12 courses, is required to earn the M.L.I.S. degree. All students are required to enroll in two non-credit classes, 501–Introduction to Library and Information Professions in their first semester, and 502–Colloquium in a later semester. There are no language requirements for the M.L.I.S. degree, and there is no thesis or comprehensive examination.

Number of Full Time Faculty—22; Number of Other Faculty—15

Degrees awarded in 2011–2012 Academic Year—Masters—143; PhD—10; Other—0

Name of Institution—Fordham University

Name of Department or Program—MA Program in Public Communications in the Department of Communication and Media Studies

Address:
Rose Hill Campus, 441 E. Fordham Rd.
Bronx, NY
10458
US

Phone Number—(718)817-4860 Fax Number—(718)817-4868

Email Contact—mccourt@fordham.edu URL—http://www.fordham.edu

Contact Person—Fred Wertz, Department Chair, Tom McCourt, Director of Graduate Studies

Specializations—The M.A. in Public Communications has three concentrations, (1) Media Analysis and Criticism, (2) Industries, Publics, and Policy, (3) Screen Arts and Culture.

Features—Extensive Internship program: full-time students can complete program in 12 months, but many students take 18 months to complete the program.

Admission Requirements—3.0 undergraduate GPA. Fellowship Applicants must take the GREs.

Degree Requirements—10 courses (30) credits and either a media project, or a research paper or an M.A. Thesis to complete the degree.

Number of Full Time Faculty—12; Number of Other Faculty—4

Degrees awarded in 2011–2012 Academic Year—Masters—20; PhD—0; Other—0

Name of Institution—Ithaca College

Name of Department or Program—Roy H. Park School of Communications

Address:
953 Danby Road
Ithaca, NY
14850
US

Phone Number—(607)274-1025 Fax Number—(607)274-7076

Email Contact—youngc@ithaca.edu URL—http://www.ithaca.edu/gps/gradprograms/programsites/comm/programs/gradcomm/

Contact Person—Cory Young, Associate Professor, Chair, Graduate Program in Communications; Roy H. Park, School of Communications.

Specializations—M.S. in Communications. Students in this program find employment in such areas as instructional design/training, web development, corporate/community/public relations and marketing, and employee communication. The program can be tailored to individual career goals.

Features—Program is interdisciplinary, incorporating organizational communication, instructional design, management, and technology.

Admission Requirements—3.0 GPA, recommendations, statement of purpose, resume, application forms and transcripts, TOEFL 550 (or 213 computer-scored; 80 on the iBT version) where applicable.

Degree Requirements—36 semester hours including capstone seminar.

Number of Full Time Faculty—6; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—15; PhD—0; Other—0

Name of Institution—State University College of Arts and Science at Potsdam.

Name of Department or Program—Organizational Leadership and Technology

Address:
392 Dunn Hall
Potsdam, NY
13676
US

Phone Number—(315)267-2670 Fax Number—(315)267-3189

Email Contact—betrusak@potsdam.edu URL—http://www.potsdam.edu/olt

Contact Person—Dr. Anthony Betrus, Program Coordinator

Specializations—M.S. in Education in Instructional Technology with the following program concentrations: Educational Technology Specialist, K-12 Track Educational Technology Specialist, Non-K-12 Track Organizational Performance, Leadership, and Technology Organizational Leadership

Features—Live instruction Evening courses 12-week courses Internships

Admission Requirements—(1) Submission of an official transcript of an earned baccalaureate degree from an accredited institution. (2) A minimum GPA of 2.75 (4.0 scale) in the most recent 60 credit hours of coursework. (3) Submission of the Application for Graduate Study (w/$50 nonrefundable fee). (4) For students seeking the Educational Technology Specialist Certification, a valid NYS Teaching Certificate is required.

Degree Requirements—36 semester hours, including internship or practicum; culminating project required

Number of Full Time Faculty—2; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—18; PhD—0; Other—0

Name of Institution—Wright State University

Name of Department or Program—College of Education and Human Services, Dept. of Leadership Studies

Address:
421 Allyn Hall, 3640 Colonel Glenn Highway
Dayton, OH
45435
US

Phone Number—(937)775-2509 or (937)775-4148 Fax Number—(937)775-2405

Email Contact—marguerite.veres@wright.edu URL—http://www.cehs.wright.edu/academic/educational_leadership/lib-media/index.php

Contact Person—Maggie Veres

Specializations—M.Ed. or M.A. in Computer/Technology or Library Media

Features—Ohio licensure available in Multi-age library media (ages 3–21) Computer/technology endorsement above licensure only available on a graduate basis. Multi-age library media licensure available in two tracks: initial (no previous teaching license) and advanced (with current teaching license in another field). The computer/technology endorsement must be added to a current teaching license.

Admission Requirements—Completed application with nonrefundable application fee, Bachelor's degree from accredited institution, official transcripts, 2.7 overall GPA for regular status (conditional acceptance possible), statement of purpose, satisfactory scores on MAT or GRE.

Degree Requirements—M.Ed. requires a comprehensive portfolio; M.A. requires a 6-h thesis

Number of Full Time Faculty—2; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—7; PhD—0; Other—0

Name of Institution—Kent State University

Name of Department or Program—Instructional Technology

Address:
405 White Hall
Kent, Ohio
44242
US

Phone Number—(330) 672-0607 Fax Number—(330) 672-2512

Email Contact—dtiene@kent.edu URL—http://www.kent.edu/ehhs/itec/index.cfm

Contact Person—Dr. Drew Tiene, Coordinator: Instructional Technology Program

Specializations—M.Ed. in Instructional Technology, and licensure program in Computing/Technology. Ph.D. in Educational Psychology with concentration in Instructional Technology.

Features—Programs are planned with advisors to prepare students for careers in elementary, secondary, or higher education, business, industry, government agencies, or health facilities. Students may take advantage of independent research, individual study, and internships. Most courses and programs can be taken online.

Admission Requirements—Master's: Bachelors degree with 3.00 undergraduate GPA, 2 references Doctorate: Masters Degree, acceptable graduate GPA & GRE scores, goal statement, 3 references

Degree Requirements—Master's: 34–37 semester hours, portfolio, practicum (for licensure) Doctoral: minimum of 45 post-masters semester hours, comprehensive exam, dissertation

Number of Full Time Faculty—5; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—30; PhD—3; Other—0

Name of Institution—Ohio University

Name of Department or Program—Instructional Technology

Address:
McCracken Hall
Athens, Ohio
45701-2979
US

Phone Number—(740)597-1322 Fax Number—(740)593-0477

Email Contact—moored3@ohio.edu URL—http://www.cehs.ohio.edu/academics/es/it/index.htm

Contact Person—David Richard Moore, Instructional Technology Program Coordinator

Specializations—Certificate in Instructional Design http://www.cehs.ohio.edu/academics/es/it/idps.htm M.Ed. in Computer Education and Technology. Ph.D. in Curriculum and Instruction with a specialization in Instructional Technology also available; call for details (740-593-4561) or visit the website: http://www.ohio.edu/education/dept/es/it/index.cfm

Features—Masters program is a blended online delivery.

Admission Requirements—Bachelors degree, 3.0 undergraduate GPA, 35 MAT, 500 GRE (verbal), 500 GRE (quantitative), 550 TOEFL, three letters of recommendation, Paper describing future goals and career expectations from completing a degree in our program.

Degree Requirements—Masters—36 semester credits, electronic portfolio, or optional thesis worth 2–10 credits or alternative seminar research paper. Students may earn two graduate degrees simultaneously in education and in any other field. Ph.D.—66 h with 15 h being dissertation work

Number of Full Time Faculty—4; Number of Other Faculty—0

Degrees awarded in 2011–2012 Academic Year—Masters—18; PhD—10; Other—0

Name of Institution—University of Toledo

Name of Department or Program—Curriculum & Instruction

Address:
2801W. Bancroft Street, Mail Stop 924
Toledo, Ohio
43606
US

Phone Number—(419)530-7979 Fax Number—(419)530-2466

Email Contact—Berhane.Teclehaimanot@utoledo.edu URL—http://tipt3.utoledo.edu

Contact Person—Berhane Teclehaimanot, Ph.D.

Specializations—Technology Using Educator/Technology Coordinator and Instructional Designer.

Features—Graduate students may concentrate on one of the two primary "roles," or may choose a blended program of study. Program was completely redesigned in 2004.

Admission Requirements—Master's: 3.0 undergrad. GPA, GRE (if undergrad. GPA < 2.7), recommendations; Doctorate: Master's degree, GRE, TOEFL (as necessary), recommendations, entrance writing samples, and interview.

Degree Requirements—Master's: 30 semester hours, culminating project; Doctorate: 60 semester hours (after MS), major exams, dissertation.

Number of Full Time Faculty—2; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—11; PhD—1; Other—1

Name of Institution—The University of Oklahoma

Name of Department or Program—Instructional Psychology and Technology, Department of Educational Psychology

Address:
321 Collings Hall
Norman, OK
73019
US

Phone Number—(405)325-5974 Fax Number—(405)325-6655

Email Contact—mcrowson@ou.edu URL—http://education.ou.edu/ipt/

Contact Person—Dr. H. Michael Crowson, Program Area Coordinator

Specializations—Master's degree with an emphasis on Instructional Design & Technology (includes tracks: Instructional Design; and Interactive Learning Technologies), and Instructional Psychology & Technology (includes tracks: Instructional Psychology & Technology; Teaching & Assessment; Teaching & Learning; and Integrating Technology in Teaching). Doctoral degree in Instructional Psychology and Technology.

Features—Strong interweaving of principles of instructional psychology with instructional design and development. Application of IP&T in K-12, vocational education, higher education, business and industry, and governmental agencies.

Admission Requirements—Master's: acceptance by IPT program and Graduate College based on minimum 3.00 GPA for last 60 h of undergraduate work or last 12 h of graduate work; written statement that indicates goals and interests compatible with program goals. Doctoral: minimum 3.25 GPA, GRE scores, written statement that indicates goals and interests compatible with program goals, writing sample, and letters of recommendation.

Degree Requirements—Master's: 36 h course work with 3.0 GPA; successful completion of thesis or comprehensive exam. Doctorate: see program description from institution or http://education.ou.edu/ipt/

Number of Full Time Faculty—11; Number of Other Faculty—0

Degrees awarded in 2011–2012 Academic Year—Masters—6; PhD—6; Other—0

Name of Institution—Lehigh University

Name of Department or Program—Teaching, Learning, and Technology

Address:
111 Research Drive
Bethlehem, PA
18015
US

Phone Number—(610)758-3230 Fax Number—(610)758-6223

Email Contact—mj.bishop@lehigh.edu URL—http://www.lehigh.edu/education/tlt/

Contact Person—MJ Bishop, Associate Professor and Teaching, Learning, and Technology Program Director

Specializations—M.S. in Instructional Design and Technology: Emphasizes design, development, implementation, integration, and evaluation of technology for teaching and learning. The degree is well suited to both designers (producers) and implementers (consumers) of instructional technologies. Graduate certificate in Technology Use in the Schools: This 12-credit grad certificate focuses on integrating technology into daily practice in the schools. Ph.D. in Teaching and Learning, concentration in Instructional Design and Technology: Emphasizes cognitive processes and their implications for the design, development, and evaluation of technology-based teaching and learning products in a variety of settings.

Features—Our professional development programs in instructional design and technology focus on the systematic design, planning, and use of technology. The program is targeted toward individuals from varied backgrounds who wish to help educators or learn themselves to design, develop, and incorporate technology more effectively in diverse educational settings (including K-12, higher education, informal learning, and corporate training). Both masters and doctoral students collaborate with faculty on projects and studies (including national presentation and publication).

Admission Requirements—M.S. (competitive): 3.0 undergraduate GPA or 3.0 graduate GPA, GREs recommended, transcripts, at least 2 letters of recommendation, statement of personal and professional goals, application fee. Application deadlines: July 15 for fall admission, Dec 1 for spring admission, Apr 30 for summer admission. Ph.D. (highly competitive): 3.5 graduate GPA, GREs required. Copy of two extended pieces of writing (or publications); statement of future professional goals; statement of why Lehigh best place to meet those goals; identification of which presentations, publications, or research by Lehigh faculty attracted applicant to Lehigh. Application deadline: December 1 (admission only once per year from competitive pool)

Degree Requirements—M.S.: 30 credits; thesis option. Ph.D.: 48 credits post-masters (including dissertation). Qualifying Exam (written and oral) + General Examination Research Project (publication quality) + dissertation.

Number of Full Time Faculty—5; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—8; PhD—2; Other—0

Name of Institution—University of South Carolina Aiken and University of South Carolina Columbia

Name of Department or Program—Aiken: School of Education; Columbia: Department of Educational Psychology

Address:
471 University Parkway
Aiken, SC
29801
US

Phone Number—803.641.3489 Fax Number—803.641.3720

Email Contact—smyth@usca.edu URL—http://edtech.usca.edu

Contact Person—Dr. Thomas Smyth, Professor, Program Director

Specializations—Master of Education in Educational Technology (A Joint Program of The University of South Carolina Aiken and Columbia)

Features—The Masters Degree in Educational Technology is designed to provide advanced professional studies in graduate-level coursework to develop capabilities essential to the effective design, evaluation, and delivery of technology-based instruction and training (e.g., software development, multimedia development, assistive technology modifications, web-based development, and distance learning). The program is intended (1) to prepare educators to assume leadership roles in the integration of educational technology into the school curriculum, and (2) to provide graduate-level instructional opportunities for several populations (e.g., classroom teachers, corporate trainers, educational software developers) that need to acquire both technological competencies and understanding of sound instructional design principles and techniques. The program is offered entirely online as high-quality, interactive, web-based courses. There are occasional synchronous online meetings, but the vast majority of the program is asynchronous. Candidates present a program portfolio for review by the faculty at the end of the program.

Admission Requirements—Application to the Educational Technology Program can be made after completion of at least the bachelors degree from a college or university accredited by a regional accrediting agency. The standard for admission will be based on a total profile for the applicant. The successful applicant should have an undergraduate grade point average of at least 3.0, a score of 45 on the Miller's Analogies Test or scores of 450 on both the verbal and quantitative portions of the Graduate Record Exam, a well-written letter of intent that matches the objectives of the program and includes a description of previous technology experience, and positive letters of recommendation from individuals who know the professional characteristics of the applicant. Any exceptions for students failing to meet these standards shall be referred to the Admissions Committee for review and final decision.

Degree Requirements—36 semester hours, including instructional theory, computer design, and integrated media

Number of Full Time Faculty—4; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—21; PhD—0; Other—0

Name of Institution—Dakota State University

Name of Department or Program—Educational Technology

Address:
820 North Washington Ave.
Madison, SD
57042
US

Phone Number—1-888-DSU-9988 Fax Number—(605) 256-5093

Email Contact—mark.hawkes@dsu.edu URL—http://www.dsu.edu/mset/index.aspx

Contact Person—Mark Hawkes

Specializations—The MSET program offers two specializations: Distance Education and Technology Systems. These specializations are indicated on the official transcript. Students who wish to choose one of these specializations or the technology endorsement must take designated electives as follows: Distance Education: CET 747 Web & ITV Based Applications of Dist Ed (3 credit hours) CET 749 Policy and Management of Distance Education (3 credit hours) CET 769 Adult Learning for Dist Ed (3 credit hours) Technology Systems CET 747 Web & ITV Based Applications of Dist Ed (3 credit hours) CET 750 Multimedia II (2 credit hours) CET 753 Network Management in Educational Institutions (3 credit hours) CET 758 Advanced Instructional Programing (2 credit hours) K-12 Educational Technology Endorsement Individuals who hold or are eligible for teaching certification may earn the K-12 Educational Technology Endorsement by completing specified courses within the MSET program.

Features—The Master of Science in Educational Technology (MSET) is an instructional technology program designed to meet the rapidly increasing demand for educators who are trained to integrate computer technologies into the curriculum and instruction. As computers and technology have become a significant part of the teaching and learning process, addressing the information needs of teachers has become the key to integrating technology into the classroom and increasing student learning. The primary emphasis of the masters program is to prepare educators who can create learning environments that integrate computing technology into the teaching and learning process. The MSET degree is an advanced degree designed to equip educators to be: leaders in educational technology current in teaching and learning processes and practices current in research technologies and designs knowledgeable of technologies and programing skills knowledgeable of current, technology-based educational tools and products. Specifically by the end of the program MSET students will understand the capabilities of the computer and its impact upon education. They will be proficient in the use and application of computer software and will be able to demonstrate proficiency in using computers and related technologies to improve their own and their students learning needs. The program integrates a highly technological environment with a project-based curriculum. Its focus is supported by an institutionally systemic belief that there is a substantial role for technology in teaching and learning in all educational environments.

Admission Requirements—Baccalaureate degree from an institution of higher education with full regional accreditation for that degree. Satisfactory scores on the GRE. The test must have been taken within the last 5 years. The GRE test can be waived if one of the following conditions is met: A cumulative grade point average of 3.25 or higher on a 4.0 scale for a baccalaureate degree from a regionally accredited college or university in the US Official admission into and demonstrated success in a regionally accredited graduate program in the US Demonstrated success is defined as grades of A or B in at least 12 h of graduate work. OR Graduation from a regionally accredited college/university in the United States at least 15 years ago or more. Other factors (such as student maturity, references, or special expertise) also may be used to determine admission to the program. Also see program-specific admission requirements for additional requirements. Demonstrated basic knowledge of computers and their applications for educational purposes. Basic knowledge can be demonstrated in one of the following ways: Technology endorsement from an accredited university; or In-service position as full or part-time technology coordinator in a public school. A personal statement of technological competency. The statement should not exceed two pages and should be accompanied by supporting documentation or electronic references, e.g., URL.

Degree Requirements—The program requires a total of 36 credits beyond the baccalaureate degree. All students must take the following: 25 h of required courses. 11 h of electives. It is possible to specialize in either Distance Education or Technology Systems by selecting the designated electives for that specialization. You can also get a K-12 Educational Technology Endorsement. It is also possible to select the thesis option from among the electives. MSET courses are offered using a variety of distance delivery methods. At this time, one required course and one elective course has a limited length hands-on campus requirement. These courses are offered in summer and the residency requirement is limited to 1 week per course. Alternatives may be available for the distance student.

Number of Full Time Faculty—3; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—25; PhD—0; Other—0

Name of Institution—Texas A&M University

Name of Department or Program—Educational Technology Program, Dept. of Educational psychology

Address:
College of Education & Human Development
College Station, Texas
77843-4225
US

Phone Number—(979)845-7276 Fax Number—(979)862-1256

Email Contact—spedersen@tamu.edu URL—http://educ.coe.tamu.edu/~edtc

Contact Person—Susan Pedersen (contact Kristie Stramaski for application materials/questions)

Specializations—M.Ed. in Educational Technology; Ph.D. in Learning Sciences. The purpose of the Educational Technology Program is to prepare educators with the competencies required to improve the quality and effectiveness of instructional programs at all levels. A major emphasis is placed on the design of educational materials that harness the potential of emerging technologies. The program goal is to prepare graduates with a wide range of skills to work as professionals and leaders in a variety of settings, including education, business, industry, and the military.

Features—Masters program can be completed entirely online. The college and university maintain facilities to support both distance and resident students.

Admission Requirements—M.Ed.: Bachelors degree, GRE (no specific cut-offs, but 147 both V and Q recommended), TOEFL; Ph.D.: 3.0 GPA, 150 GRE Verbal; letters of recommendation, general background, and student goal statement.

Degree Requirements—M.Ed.: 36 semester credits; Ph.D.: course work varies with student goals—degree is a Ph.D. in Learning Sciences with specialization in educational technology.

Number of Full Time Faculty—1; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—11; PhD—1; Other—0

Name of Institution—The University of Texas at Austin

Name of Department or Program—Curriculum & Instruction

Address:
406 Sanchez Building
Austin, Texas
78712-1294
US

Phone Number—(512)471-5942 Fax Number—(512)471-8460

Email Contact—Mliu@austin.utexas.edu URL—http://www.edb.utexas.edu/education/departments/ci/programs/it/

Contact Person—Min Liu, Ed.D., Professor and IT Program Area Coordinator/Graduate Advisor

Specializations—The University of Texas at Austin's College of Education is ranked number one in the nation among public universities by US News & World Report's 2013 edition of "America's Best Graduate Schools." It's ranked number three among public and private universities nationally. The Learning Technologies (LT) Program is a graduate program and offers degrees at the master and doctoral levels. Masters degrees in LT provide students with knowledge and skills of cutting-edge new media technologies, learning theories, instructional systems design, human–computer interaction, and evaluation. They prepare students to be leaders and practitioners in various educational settings, such as K-12, higher education, and training in business and industry. Ph.D. program provides knowledge and skills in areas such as instructional systems design, learning and instructional theories, instructional materials development and design of learning environments using various emerging technology-based systems and tools. Graduates assume academic, administrative, and other leadership positions such as professors, instructional technologists at school district level, managers and researchers of instructional design and instructional evaluators.

Features—The program is interdisciplinary in nature, although certain competencies are required of all students. Programs of study and dissertation research are based on individual needs and career goals. Learning resources include state-of-the-art labs in the Learning Technology Center in the College of Education, and university-wide computer labs. Students can take courses offered by other departments and colleges as relevant to their interests. Students, applying to the program, have diverse backgrounds and pursue careers of their interests. The program caters students with both K-12 as well as corporate backgrounds.

Admission Requirements—Learning Technologies program considers only applications for fall admission, with the deadline of December 15. November 15—Deadline for consideration of financial award Admission decisions is rendered based on consideration of the entire applicant file, including GPA, test scores, references, experience, and stated goals. No single component carries any more significance than another. However, priority may be given to applicants who meet the following preferred criteria: GPA 3.0 or above GRE 1,100 or above (verbal + quantitative, with at least 400 verbal) TOEFL 213 or above (computer)/550 or above (paper-based)/79 or 80 (Internet-based) TOEFL http://www.edb.utexas.edu/education/departments/ci/studentinfo/pstudents/grad/application/

Degree Requirements—see http://www.edb.utexas.edu/education/departments/ci/programs/it/studentinfo/cstudents/grad/degrees/ for details

Number of Full Time Faculty—4; Number of Other Faculty—38

Degrees awarded in 2011–2012 Academic Year—Masters—6; PhD—2; Other—0

Name of Institution—Texas Tech University

Name of Department or Program—Instructional Technology

Address:
Box 41071,TTU
Lubbock, TX
79409
US

Phone Number—(806)742-1997, ext. 297 Fax Number—(806)742-2179

Email Contact—Steven.Crooks@ttu.edu URL—http://edit.educ.ttu.edu

Contact Person—Dr. Steven Crooks, Program Coordinator, Instructional Technology

Specializations—M.Ed. in Instructional Technology; completely online M.Ed. in Instructional Technology; Ed.D. in Instructional Technology

Features—Program is NCATE accredited and follows ISTE and AECT guidelines.

Admission Requirements—Holistic evaluation based on GRE scores (Doctorate only), GPA, student goals, and writing samples

Degree Requirements—M.Ed.: 39 h (21 h instructional technology core, 12 h instructional technology electives, 6 h education foundations and research). Ed.D.: 93 h (45 h in educational technology, 15 h in minor or additional support courses, 21 h in education or resource area, 12 h dissertation).

Number of Full Time Faculty—4; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—22; PhD—5; Other—0

Name of Institution—University of Houston

Name of Department or Program—Curriculum & Instruction

Address:
256 Farish Hall, Mail Code 5027
Houston, TX
77204-5027
US

Phone Number—713-743-4975 Fax Number—713-743-4990

Email Contact—smcneil@uh.edu URL—http://www.coe.uh.edu/current-students/academic-programs/instructional-technology/index.php

Contact Person—Sara McNeil

Specializations—Instructional design; Urban community partnerships enhanced by technology; Integration of technology in teacher education; Visual representation of information; Linking instructional technology with content area instruction; Educational uses of digital media (including digital photography, digital video and digital storytelling); Collaborative design and development of multimedia; Uses of instructional technology in health science education

Features—The IT Program at the University of Houston can be distinguished from other IT programs at other institutions through our unique philosophy based on a strong commitment to the broad representations of community, the individual, and the collaboration that strengthens the two. We broadly perceive community to include our college, the university, and the local Houston environment.

The community is a rich context and resource from which we can solicit authentic learning tasks and clients, and to which we can contribute new perspectives and meaningful products. Our students graduate with real-world experience that can only be gained by experience with extended and coordinated community-based projects, not by contrived course requirements. Our program actively seeks outside funding to promote and continue such authentic projects because we so strongly believe it is the best context in which our students can develop expertise in the field. We recognize that each student brings to our program a range of formal training, career experience, and future goals. Thus, no longer can we be satisfied with presenting a single, static curriculum and still effectively prepare students for a competitive marketplace. Our beliefs have led us to develop a program that recognizes and celebrates student individuality and diversity. Students work with advisors to develop a degree plan that begins from their existing knowledge and strives toward intended career goals. We aim to teach not specific software or hardware operations, but instead focus on transferable technical skills couched in solid problem-solving experiences, theoretical discussions, and a team-oriented atmosphere. Students work throughout the program to critically evaluate their own work for the purpose of compiling a performance portfolio that will accurately and comprehensively portray their individual abilities to themselves, faculty, and future employers. Completing our philosophical foundation is a continuous goal of collaboration. Our faculty operates from a broad collaborative understanding that recognizes how everyone involved in any process brings unique and valuable experiences and perspectives. Within the IT program, faculty, staff, and students rely on each other to contribute relevant expertise. Faculty members regularly seek collaboration with other faculty in the College of Education, especially those involved with teacher education, as well as with faculty in other schools across campus. Collaboration is a focus that has been infused through the design of our courses and our relationships with students. Facebook: http://www.facebook.com/groups/189269174434698/

Admission Requirements—Admission information for graduate programs: http://www.coe.uh.edu/current-students/academic-programs/instructional-technology/index.php Masters program: 3.0 grade point average (GPA) for unconditional admission or a 2.6 GPA or above for conditional admission over the last 60 h of coursework attempted Graduate Record Exam: The GRE must have been taken within five (5) years of the date of application for admission to any Graduate program in the College of Education. Doctoral program: Each applicant must normally have earned a masters degree or have completed 36 semester hours of appropriate graduate work with a minimum GPA of 3.0 (A = 4.0). Graduate Record Exam: The GRE must have been taken within five (5) years of the date of application for admission to any Graduate program in the College of Education.

Degree Requirements—Masters: Students with backgrounds in educational technology can complete the Masters program with 30 h of coursework. For the typical student, the M.Ed. in Instructional Technology consists of 9 semester hours of core courses required by the College of Education, and an additional 12 h core in Instructional Technology as well as 9 h that are determined by the students' career goals (K-12, higher education, business, and industry). Students take a written comprehensive examination over the program, coursework, and experiences. Doctoral: The minimum hours required in the doctoral program is 66. More details about the courses and requirements can be found online at: http://www.coe.uh.edu/academic-programs/cuin-ed-instruction-technology/index.php

Number of Full Time Faculty—5; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—15; PhD—10; Other—0

Name of Institution—Utah State University

Name of Department or Program—Department of Instructional Technology & Learning Sciences, Emma Eccles Jones College of Education and Human Services

Address:
2830 Old Main Hill
Logan, Utah
84322-2830
US

Phone Number—(435)797-2694 Fax Number—(435)797-2693

Email Contact—mimi.recker@usu.edu URL—http://itls.usu.edu

Contact Person—Dr. Mimi Recker, Prof., Head.

Specializations—M.S. and M.Ed. with concentrations in the areas of Instructional Technology, Learning Sciences, Multimedia, Educational Technology, and Information Technology/School Library Media Administration. Ph.D. in Instructional Technology & Learning Sciences is offered for individuals seeking to become professionally involved in instructional/learning sciences research and development in higher education, corporate education, public schools, community colleges, and government. M.Ed. and M.S. programs in Instructional Technology/School Library Media Administration and Educational Technology are also available completely online. The doctoral program is built on a strong Master's and Specialists program in Instructional Technology. All doctoral students complete a core with the remainder of the course selection individualized, based upon career goals.

Features—Facebook: http://www.facebook.com/usuitls (online: facebook.com/usuitlsonline) Online Students Facebook Page: http://www.facebook.com/usuitlsonline Twitter: http://www.twitter.com/utahstateitls LinkedIn: http://www.linkedin.com/ YouTube: http://www.youtube.com/usuitls

Admission Requirements—M.S. and Ed.S.: 3.0 GPA, a verbal and quantitative score at the 40th percentile on the GRE or 43 MAT, three written recommendations. Ph.D.: relevant Master's degree, 3.0 GPA, verbal and quantitative score at the 40th percentile on the GRE, three written recommendations, essay on research interests.

Degree Requirements—M.S.: 39 semester hours; thesis or project option. Ed.S.: 30 semester hours if M.S. is in the field, 40 h if not. Ph.D.: 60 total hours, dissertation, 3-semester residency, and comprehensive examination.

Number of Full Time Faculty—10; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—35; PhD—7; Other—0

Name of Institution—George Mason University

Name of Department or Program—Learning Technologies

Address:
Mail Stop 5D6, 4400 University Dr.
Fairfax, VA
22030-4444
US

Phone Number—(703)993-3798 Fax Number—(703)993-2722

Email Contact—ndabbagh@gmu.edu URL—http://learntech.gmu.edu/

Contact Person—Dr. Nada Dabbagh, Director, Division of Learning Technologies

Specializations—Ph.D. Program Learning Technologies Design Research (with specialization in Instructional Design, Integration of Technology in Schools or Assistive Technology) Masters Degrees—Curriculum and Instruction with concentrations in: Instructional Design & Development Program—Integration of Technology in Schools Program—Integration of Online Learning in Schools Program Graduate Certificates—e-Learning—Integration of Technology in Schools—Integration of Online Learning in Schools

Features—The Division of Learning Technologies supports the following academic programs: Instructional Design and Development (IDD): provides professionals with the knowledge and skills to design effective and innovative learning solutions to instructional and performance problems; graduates of this program are workplace-ready for instructional design responsibilities in public, private, government, and educational settings. Learning Technologies in Schools (LTS) program provides teachers and educators with the knowledge and skills to effectively integrate technology in K-12 classroom and online learning environments; graduates of this program frequently become the local expert and change agent for technology in schools. Ph.D. Concentration in Learning Technologies Design Research (LTDR): an innovative program that engages doctoral students in real world, workplace-based integrated design and research; LTDR addresses cross-disciplinary progressive cycles of design, development, and research focused on promoting strategic thinking, innovation and creativity in the design of learning technologies to achieve organizational goals. http://www.facebook.com/MasonLearnTech https://twitter.com/MasonCEHD

Admission Requirements—Masters Program—Teaching or training experience, undergrad GPA of 3.0, TOEFL of 575(written)/230(computer), three letters of recommendation, goal statement. Ph.D. Program—http://gse.gmu.edu/programs/phd/

Degree Requirements—M.Ed. in Curriculum Instructional Design and Development, 30 h; M.Ed. in Curriculum and Instruction Integration of Technology in Schools: 36 h; practicum M.Ed. in Curriculum and Instruction Integration of Online Learning in Schools: 30 h. Ph.D.: 65 h beyond Master's degree. Certificate programs: 15 h

Number of Full Time Faculty—6; Number of Other Faculty—4

Degrees awarded in 2011–2012 Academic Year—Masters—50; PhD—10; Other—15

Name of Institution—Virginia Tech

Name of Department or Program—Instructional Design and Technology

Address:
116 War Memorial Hall (0313)
Blacksburg, VA
24061-0313
US

Phone Number—(540)231-5587 Fax Number—(540)231-9075

Email Contact—mae@vt.edu URL—http://www.soe.vt.edu/idt/

Contact Person—Michael A. Evans, Program Area Leader

Specializations—M.A., Ed.S., Ed.D., and Ph.D. in Instructional Design and Technology. Graduates of our Masters and Educational Specialist programs find themselves applying their expertise in a variety of rewarding, professional venues; for example, as instructional designers, trainers, or performance consultants in industrial settings and as teachers or technology coordinators in preK-12. Graduates of our Doctoral program typically assume exciting roles as faculty in higher education, advancing research in the field and preparing the next generation of instructional technologists for the profession.

Features—Areas of emphasis are Instructional Design, Learning Sciences, Distance Education, and Multimedia Development. Facilities include computer labs, extensive digital video and audio equipment, distance education classroom, and computer graphics production areas.

Admission Requirements—Ed.D. and Ph.D.: 3.3 GPA from Masters degree, GRE scores, writing sample, three letters of recommendation, transcripts. M.A.: 3.0 GPA Undergraduate.

Degree Requirements—Ph.D.: 90 h above B.S., 2-year residency, 12 h. research classes, 30 h. dissertation; Ed.D.: 90 h. above B.S., 1-year residency, 12 h. research classes; M.A.: 30 h. above B.S.

Number of Full Time Faculty—6; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—28; PhD—5; Other—4

Name of Institution—University of Alaska Southeast

Name of Department or Program—Educational Technology Program

Address:
11120 Glacier Hwy, HA1
Juneau, AK
99801
USA

Phone Number—907-796-6050 Fax Number—907-796-6059

Email Contact—marsha.gladhart@uas.alaska.edu URL—http://uas.alaska.edu/education/experienced

Contact Person—Marsha Gladhart

Specializations—Educational Technology

Features—* distance program * standards-based learning * integration of the most current technologies * collaboration with other teachers * instructors with K-12 teaching experience * focus on improving student learning * use of technology as a tool to assist learning

Admission Requirements—# A completed graduate application and $60 processing fee. # Official academic transcript indicating baccalaureate degree and a GPA of 3.0 # Two (2) general recommendations written by former or current professors, employers, or supervisors who are familiar with your work and performance. Each recommendation must be submitted using the Letter of Recommendation for Graduate Programs form. # A recommendation documenting your ability to meet the educational technology standards required for entry to the program. This recommendation should be completed by an administrator, supervisor, or technology leader. # Statement of Professional Objectives.

Degree Requirements—Official academic transcript indicating baccalaureate degree and a GPA of 3.0

Number of Full Time Faculty—2; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—15; PhD—0; Other—0

Name of Institution—University of Arkansas

Name of Department or Program—Educational Technology

Address:
101 Peabody Hall
Fayetteville, AR
72701
USA

Phone Number—479-575-5111 Fax Number—479-575-2493

Email Contact—etec@uark.edu URL—http://etec.uark.edu

Contact Person—Dr. Cheryl Murphy

Specializations—The program prepares students for a variety of work environments by offering core courses that are applicable to a multitude of professional venues. The program also allows for specific emphasis area studies via open-ended assignments and course electives that include courses particularly relevant to higher education, business/industry, or K-12 environments. The primary focus of the program is on the processes involved in instructional design, training and development, media production, and utilization of instructional technologies. Because technology is continually changing, the program emphasizes acquisition of a process over the learning of specific technologies. Although skills necessary in making Educational Technology products are taught, technology changes rapidly; therefore, a primary emphasis on making technological products would lead to the acquisition of skills that are quickly outdated. However, learning the principles and mental tools critical to producing successful training and education will endure long after "new" technologies have become obsolete. That is why the University of Arkansas ETEC program focuses on the processes as opposed to specific technologies.

Features—The Educational Technology Program is a 34-h non-thesis online masters program that prepares students for professional positions as educational technologists of education, business, government, and the health professions. Because the program is offered online, there are no on-campus requirements for the completion of this degree. Check us out on Facebook at UAetec.

Admission Requirements—The Educational Technology online masters program admits students in the fall, spring, and summer. Applications and all accompanying documents must be submitted within 3 months of the desired starting semester to ensure adequate processing time. To qualify for admission applicants must have an earned bachelors degree and an undergraduate GPA of 3.0 within the last 60 h of coursework. Specific application materials can be found at http://etec.uark.edu/1069.htm Applicants for the M.Ed. degree must have met all requirements of Graduate School admission, completed a bachelors degree, and earned a 3.0 GPA in all undergraduate coursework or obtain an acceptable score on the Graduate Record Examinations or Miller Analogies Test. A Graduate School application, ETEC Program Application, writing sample, autobiographical sketch, and letters of recommendation are required for admission consideration.

Degree Requirements—In addition to general admission requirements students must complete a minimum of 34 h to include 22 semester hours of educational technology core courses; nine semester hours of educational technology electives; and three semester hours of research. Additionally, a Culminating Student Portfolio must be successfully completed during the last semester of coursework. There are no on-campus requirements for the completion of this degree, although approved courses that meet the research requirements may be taken on campus if desired.

Number of Full Time Faculty—2; Number of Other Faculty—3

Degrees awarded in 2011–2012 Academic Year—Masters—11; PhD—0; Other—0

Name of Institution—California State Polytechnic University

Name of Department or Program—Educational Multimedia Design

Address:
3801 West Temple Ave
Pomona, CA
91768
USA

Phone Number—909-869-2255 Fax Number—909-869-5206

Email Contact—slotfipour@csupomona.edu URL—http://www.csupomona.edu/emm

Contact Person—Dr. Shahnaz Lotfipour

Specializations—Design and production of e-Learning materials and educational multimedia software (including audio, video, animation, web programing (3 levels), graphics, e-Books, mobile apps) for educational and corporate training environments using the sound instructional design principles and strategies.

Features—Hands-on training, project-based, combination of online and hybrid courses, internship possibilities in educational and corporate settings

Admission Requirements—Undergraduate GPA of 3.0, three strong letters of recommendations for this program, and satisfying graduate writing test (GWT) within the first couple of quarters.

Degree Requirements—B.A. or B.S. in any area

Number of Full Time Faculty—3; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—30; PhD—2; Other—0

Name of Institution—California State University, East Bay

Name of Department or Program—MS Ed, option Online Teaching & Learning

Address:
25800 Carlos Bee Blvd
Hayward, CA
94542
USA

Phone Number—510-885-4384 Fax Number—510-885-4498

Email Contact—nan.chico@csueastbay.edu URL—http://www.ce.csueastbay.edu/degree/education/index.shtml

Contact Person—Nan Chico

Specializations—A professional development degree for experienced K-12, college/university faculty and corporate or non-profit trainers at institutions creating new, or building on old, fully online course and program degrees, workshops, trainings. A major focus is on learning how to design courses so that barriers to learning are minimized for those with disabilities, or who are English language learners, etc.

Features—Courses are in Blackboard; students are given a Blackboard shell of their own to design in or may choose among other course management systems. We focus on best practices in online teaching and learning, using a CMS and varieties of other social media. Not cohort-based, admission is quarterly (fall, winter, spring, summer); maximum 2 courses per quarter; may skip 1–2 consecutive quarters.

Admission Requirements—B.A. or B.S. degree from a regionally accredited US institution, in any major; GPA 3.0 in last 60 semester units or last 90 quarter units. Selection is also based on mandatory Letter of Intent.

Degree Requirements—Four 5-week courses taken over two quarters (which earn the Certificate in Online Teaching & Learning); two 10-week electives, four 10-week required courses, the last of which is a Capstone Project. Each course earns 4.5 quarter units; all required courses must earn a "B" or better, overall GPA must be 3.0 or better. Total of 10 courses, 45 units.

Number of Full Time Faculty—0; Number of Other Faculty—9

Degrees awarded in 2011–2012 Academic Year—Masters—60; PhD—0; Other—0

Name of Institution—California State University, Fresno

Name of Department or Program—MA in Education & Certificate of Advanced Study in Educational Technology

Address:
5005N. Maple Ave., MS2,
Fresno, CA
93740
USA

Phone Number—559-278-0245 Fax Number—559-278-0107

Email Contact—royb@csufresno.edu URL—http://www.fresnostate.edu/kremen/ci/graduate/ma-education.html

Contact Person—Dr. Roy M. Bohlin

Specializations—None

Features—None

Admission Requirements—2.75 undergraduate GPA, writing requirement, 3 letters of recommendation, letter of interest

Degree Requirements—Bachelors degree

Number of Full Time Faculty—6; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—16; PhD—0; Other—8

Name of Institution—Metropolitan State University of Denver
Name of Department or Program—Department of Special Education, Early Childhood Education, Reading, and Educational Technology

Address:
Teacher Education, Campus Box 21 P.O Box 173362
Denver, CO
80217
USA

Phone Number—(303)556-3322 Fax Number—(303) 556-5353

Email Contact—mchung3@msudenver.edu URL—http://www.mscd.edu/~ted

Contact Person—Dr. Miri Chung

Specializations—x

Features—x

Admission Requirements—x

Degree Requirements—x

Number of Full Time Faculty—2; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—0; PhD—0; Other—0

Name of Institution—Regis University

Name of Department or Program—School of Education and Counseling

Address:
3333 Regis Boulevard
Denver, CO
80221
USA

Phone Number—800-388-2366 Fax Number—303-964-5053

Email Contact—chruskoc@regis.edu URL—http://www.regis.edu

Contact Person—Dr. Kevin Pyatt

Specializations—Instructional Technology Curriculum, Instruction, and Assessment Ed Leadership for Innovation and Change; Principal Licensure Adult Learning, Training, and Development Reading

Features—The majority of our programs are offered in the online format.

Admission Requirements—Essay Letters of Recommendation Minimum GPA of 2.75

Degree Requirements—x

Number of Full Time Faculty—15; Number of Other Faculty—150

Degrees awarded in 2011–2012 Academic Year—Masters—200; PhD—0; Other—0

Name of Institution—University of Bridgeport

Name of Department or Program—Instructional Technology

Address:
126 Park Avenue
Bridgeport, CT
06604
USA

Phone Number—2035764217 Fax Number—2035764633

Email Contact—jcole@bridgeport.edu URL—http://www.bridgeport.edu/imsit

Contact Person—Jerald D. Cole

Specializations—Masters and Professional Diploma (sixth Year) Instructional Technology Tracks: (1) Teacher. (2) Trainer. (3) Developer. (4) Technology Education. (5) Technology Leadership

Features—(1) Open Source Curriculum and Software Model. (2) Cross Platform Mobil Tablet Computing Initiative. (3) Social Constructionist Pedagogy. (4) Hybrid and online courses. (5) Cohort-based. (6) Tuition-free internships for Teacher track.

Admission Requirements—Online Application Essay on experience and objectives for study Two letters of reference Praxis 1 for teacher track TOEFL for nonnative English speakers Transcripts Phone interview

Degree Requirements—4 core courses, 2 distribution requirements, 1 research, 1 practicum, 4 electives

Number of Full Time Faculty—14; Number of Other Faculty—21

Degrees awarded in 2011–2012 Academic Year—Masters—294; PhD—15; Other—117

Name of Institution—University of Florida

Name of Department or Program—School of Teaching and Learning

Address:
2403 Norman Hall
Gainesville, FL
32611-7048
USA

Phone Number—352-273-4180 Fax Number—352-392-9193

Email Contact—aritzhaupt@coe.ufl.edu URL—http://education.ufl.edu/educational-technology/

Contact Person—Albert Ritzhaupt

Specializations—Educational technology students may earn M.Ed., Ed.S., Ed.D., or Ph.D. degrees. The M.Ed., Ed.S., and Ed.D. programs are online. The MAE and Ph.D. programs are blended.

Features—Students take core courses listed on our Educational Technology website and then select an area of specialization. Opportunities to collaborative research, write and design with faculty members. Strong community of graduate students.

Admission Requirements—Please see the Educational Technology website for the most up-to-date information.

Degree Requirements—Please see the Educational Technology website for the most up-to-date information. Program and college requirements must be met but there is considerable flexibility for doctoral students to plan an appropriate program with their advisers.

Number of Full Time Faculty—4; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—18; PhD—1; Other—10

Name of Institution—University of West Florida

Name of Department or Program—Instructional and Performance Technology

Address:
11000 University Parkway
Pensacola, FL
32514
USA

Phone Number—850-474-2300 Fax Number—850-474-2804

Email Contact—krasmuss@uwf.edu URL—http://onlinecampus.uwf.edu

Contact Person—Karen Rasmussen

Specializations—M.Ed., Instructional Technology: Curriculum and Technology Telecommunications and Distance Learning Technology Leadership Human Performance Technology M.S.A., H.P.T.: Human Performance Technology Ed.S., Instructional Technology Performance Technology Distance Learning Ed.D., Curriculum and Instruction, Instructional Technology Specialization: Performance Technology Distance Learning

Features—Fully online programs at masters-level Small classes Recognized nationally as a "Best Buy" in Online Masters in Administration Like us on Facebook and Follow us on Twitter Military Friendly University Out-of-State Tuition Waivers for admitted students in fully online programs.

Admission Requirements—GRE or MAT Score Official Transcripts Letter of Intent See Department website for additional information for specific programs.

Degree Requirements—M.Ed., 36 credit hours M.S.A., 36 credit hours Ed.S., 36 credit hours Ed.D., minimum 62 credit hours

Number of Full Time Faculty—4; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—21; PhD—0; Other—5

Name of Institution—Ball State University

Name of Department or Program—Masters of Arts in Curriculum and Educational Technology

Address:
Teachers College
Muncie, IN
47306
USA

Phone Number—(765) 285-5461 Fax Number—(765) 285-5489

Email Contact—jmclaus@bsu.edu URL—http://cms.bsu.edu/Academics/CollegesandDepartments/Teachers/Departments/EdStudies/AcProgram/GradDegr/MACurriEdTech.aspx

Contact Person—Jon M. Clausen

Specializations—Specialization tracks in curriculum or educational technology

Features—The Masters of Arts in Curriculum and Educational Technology is a 30-h program designed for educators seeking to integrate technology into K-12 curriculum and other instructional contexts where teaching and learning occur. Graduates are prepared to become leaders within their instructional contexts by coursework and experiences that focus on development of a conceptual framework in which technology is an embedded aspect of the teaching and learning process.

The program prepares graduates to utilize technology to meet learning needs of students and to critically examine technologies ever-changing presence within schools and society.

Admission Requirements—Prospective students should apply to the Graduate College and provide official transcripts from all universities/colleges attended. A student seeking admittance for a Masters degree must meet the following minimum criteria: Hold an earned bachelors degree from a college or university that is accredited by its regional accrediting association—Have one of the following: An undergraduate cumulative GPA of at least 2.75 on a scale of 4.0—A cumulative GPA of at least 3.0 on a 4.0 scale in the latter half of the baccalaureate. Additional Information regarding application and admission to the graduate college can be found at the following website. http://www.bsu.edu/gradschool

Degree Requirements—Successful completion of 30 graduate hours.

Number of Full Time Faculty—8; Number of Other Faculty—4

Degrees awarded in 2011–2012 Academic Year—Masters—15; PhD—0; Other—0

Name of Institution—Indiana University

Name of Department or Program—Instructional Systems Technology, School of Education

Address:
W. W. Wright Education Bldg., Rm. 2276, 201N. Rose Ave.
Bloomington, IN
47405-1006
USA

Phone Number—(812)856-8450 Fax Number—(812)856-8239

Email Contact—istdept@indiana.edu URL—http://education.indiana.edu/~ist/

Contact Person—Thomas Brush, Chair, Dept. of Instructional Systems Technology

Specializations—The M.S. and Ed.S. degrees are designed for individuals seeking to be practitioners in the field of Instructional Technology. The M.S. degree is also offered in a web-based format with instructional product and portfolio requirements, with specializations in Workplace Learning and Performance Improvement; Instructional Systems Design Practice; and Learning Technologies. A Studio specialization is available to residential students. Online certificate and licensure programs are also available.

An online Ed.D. is now being offered as well. Our first cohort of students is beginning the program in the fall of 2012; Applications are now being accepted for our Fall 2013 cohort. The emphasis of the Ed.D. is on the application of theory to practice.

The Ph.D. degree features a heavy research emphasis via faculty-mentored research groups and student dossiers for assessing research, teaching, and service competencies.

Features—Requires computer skills as a prerequisite and makes technology utilization an integral part of the curriculum; eliminates separation of various media formats; and establishes a series of courses of increasing complexity integrating production and development. The latest in technical capabilities have been incorporated, including teaching, computer, and laptop-ready laboratories, a multimedia laboratory, and video and audio production studios. Residential masters students have a studio facility available for their exclusive use for two semesters.

Ph.D. students participate in faculty-mentored research groups throughout their program. Students construct dossiers with evidence of research, teaching, and service that are evaluated by faculty on three occasions during the program. The second and third dossier reviews replace the traditional written and oral examinations.

Admission Requirements—M.S.: Bachelor's degree from an accredited institution, 1,350 GRE (3 tests required) or 900 plus 3.5 analytical writing (new format), 2.75 undergraduate GPA. Ed.S., Ed.D., and Ph.D.: 1,650 GRE (3 tests required) or 1,100 plus 4.5 analytical writing (new format), 3.5 graduate GPA.

Degree Requirements—M.S.: 36 credit hours (including 15 credits in required courses); an instructional product; 9 credits in outside electives, and portfolio. Ed.S.: 65 h, capstone project with written report and a portfolio. Ed.D.: 60 h post-masters (M.S. credits not counted toward 60 h), with written and oral qualifying exams, and dissertation. Ph.D.: 90 h, dossier reviews, and thesis.

Number of Full Time Faculty—10; Number of Other Faculty—12

Degrees awarded in 2011–2012 Academic Year—Masters—19; PhD—7; Other—1

Name of Institution—Purdue University Calumet

Name of Department or Program—Instructional Technology

Address:
2200 169th Street
Hammond, IN
46323
USA

Phone Number—219-989-2692 Fax Number—219-989-3215

Email Contact—buckenme@purduecal.edu URL—http://www.purduecal.edu/education/grad/it.html

Contact Person—Janet Buckenmeyer

Specializations—Instructional Technology and Instructional Design

Features—The Instructional Technology program at Purdue University Calumet is a practitioner-based program. Students entering the program may be teachers but do not need a teaching license to enroll. The program does not lead to PK-12 licensure. http://www.facebook.com/PUCIDT @pucidt

Admission Requirements—3.0 GPA; Three (3) letters of recommendation; Essay; Two (2) official copies of all transcripts

Degree Requirements—x

Number of Full Time Faculty—3; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—12; PhD—0; Other—0

Name of Institution—Emporia State University

Name of Department or Program—Instructional Design and Technology

Address:
1200 Commercial St.—Campus Box 4037
Emporia, KS
66801
USA

Phone Number—620-341-5829 Fax Number—620-341-5785

Email Contact—mchildre@emporia.edu URL—http://idt.emporia.edu

Contact Person—Dr. Marcus D. Childress, Chair

Specializations—Distance learning, online learning, corporate education, P-12 technology integration

Features—All program courses are offered both online and face to face on the ESU campus. The Master of Science in Instructional Design and Technology program prepares individuals for leadership in the systematic design, development, implementation, evaluation, and management of technology-rich learning in a variety of settings. Individuals obtaining the IDT degree serve as instructional designers/trainers in business, industry, health professions, and the military and are charged with training, development, and e-Learning programs within their organizations. Other graduates hold leadership positions in P-12 and post-secondary institutions. In addition to positions in the workplace, graduates regularly choose to pursue their Ph.D. degrees in IDT at top-ranked universities. IDT faculty members hold leadership positions on the Association for Educational Communications and Technology (AECT) board of directors, executive committee, and research & theory division. Forms and application materials available at the website, http://idt.emporia.edu Other social media contacts, Ning—http://idtesu.ning.com/ Twitter—http://twitter.com/idtesu Blogspot—http://idtesu.blogspot.com/ YouTube—http://www.youtube.com/idtesu

Admission Requirements—Graduate application, official transcripts, GPA of 2.75 or more based on a 4-point scale in the last 60 semester hours of undergraduate study, resume, two current recommendations, writing competency. The program admits on a rolling basis. The departmental admission committee reviews and decides on applications as they are received, until there are no remaining openings.

Degree Requirements—36 credit hours: 21 cr. core, 6 cr. research, 9 cr. electives.

Number of Full Time Faculty—6; Number of Other Faculty—7

Degrees awarded in 2011–2012 Academic Year—Masters—52; PhD—0; Other—0

Name of Institution—Morehead State University

Name of Department or Program—Educational Technology Program

Address:
Ginger Hall
Morehead, KY
40351
USA

Phone Number—606-783-2040

Email Contact—c.miller@morehead-st.edu URL—http://www.moreheadstate.edu/education

Contact Person—Christopher T. Miller

Specializations—Master of Arts in Education degree focuses on technology integration, multimedia, distance education, educational games, and instructional design. Educational Leadership Doctor of Education in Educational Technology Leadership is a practitioner-based doctoral degree program focused on the development of leaders in the field of educational technology.

Features—Masters program is fully online. Ed.D. program is fully online with the exception of a 1-week face-to-face seminar course each year.

Admission Requirements—Admission requirements for Masters degree: * Standard or provisional teaching certification, a statement of eligibility for teaching, or letter describing your role as educational support. Those students who fit the criteria of educational support will be able to obtain the masters degree, but it cannot be used for initial teacher certification. * A GRE minimum combined score of 750 (verbal and quantitative) and 2.5 on the analytic writing portion or a minimum 31 raw score (381–386 Scaled Score) on the Miller Analogies Test. * For students who have not met testing requirements for admission into the program, but who have successfully completed 12 h of coursework required for the program with a 3.5 or above GPA, the department chair may waive the testing requirement. * The testing requirement is waived for students who have already completed a masters degree. * A minimum of 2.75 undergraduate GPA. * Demonstrated competency of computer fluency (i.e., undergraduate or graduate computer competency course or computer competency assessment). Ed.D. admission requirements: * GRE, Miller Analogies Test (MAT), or GMAT scores including GRE writing score or on-demand writing sample. * Official transcripts of all undergraduate and graduate coursework. * Documentation of a masters degree from an institution accredited by a nationally recognized accreditation body. * Resume or vita documenting years of related professional/leadership or educational technology, instructional design, and training experience. * Letter of introduction/interest stating professional goals, leadership style, and educational philosophy. * Recommendation forms: at least three professional references from persons in a position to evaluate the applicant's potential for success in a doctoral program. At least one to be completed by immediate or up-line supervisor or (for Ed. Tech track) professional familiarity with candidates use of technology, instructional design, and training. Other recommendation forms to be completed by professional colleagues or university faculty who are familiar with the applicant. * Documentation of previous statistical methodology, research-related coursework or evidence of use and application of data-informed decision making to determine possible need for statistical methodology coursework. * International students and ESL students must meet university minimum TOEFL score or its equivalent. * No more than 24 h of previously completed postgraduate work from MSU may be counted in the Ed.D. program.

Degree Requirements—Masters program degree requirements * Satisfy general degree requirements. * Must submit a professional portfolio demonstrating work completed within the program during the final semester of graduate work. * Must apply for graduation in the Graduate Office, 701 Ginger Hall, in the beginning of the term that completion is anticipated. * Maintain a 3.0 GPA in all courses taken after completing the bachelors degree. *Must be unconditionally admitted. Ed.D. Degree Requirements: * Satisfy all degree requirements. * The student must successfully complete and defend a qualifying examination to enroll in EDD 899 capstone courses and continue within the doctoral program. * Students are required to successfully complete and defend a doctoral capstone. * Students must apply for graduation with the Graduate Office at the beginning of the semester in which they intend to complete. * Maintain a cumulative 3.0 GPA in all courses taken. Must be unconditionally admitted. If a student is not unconditionally admitted after completing 12 graduate hours, he/she will not be permitted to register for additional credit hours. * Students are encouraged to complete the program within the cohort time limit. The maximum allowed time for completion is 10 years. * A total of 18 h will be permitted to be transferred from other universities.

Number of Full Time Faculty—2; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—12; PhD—0; Other—0

Name of Institution—University of Massachusetts, Amherst

Name of Department or Program—Learning, Media and Technology Masters Program/Math Science and Learning Technology Doctoral Program

Address:
813N. Pleasant St.
Amherst, MA
01003
USA

Phone Number—413-545-0246 Fax Number—413-545-2879

Email Contact—fsullivan@educ.umass.edu URL—http://www.umass.edu/education/academics/tecs/ed_tech.shtml

Contact Person—Florence R. Sullivan

Specializations—The Master of Education concentration in Learning, Media, and Technology prepares students to understand, critique, and improve technology- and media-based learning and teaching. The program is structured such that students construct solid knowledge of theories of learning and instruction, as well as theories of the design and use of educational technologies and media. Just as importantly, we offer a number of courses and research experiences through which students develop facility with applied aspects of technology-centered educational practices (e.g., developing digital media utilizing a number of authoring tools). By encountering multiple opportunities for the analysis, design and testing of educational technology/media, students develop a principled approach to technology- and media-based instruction and learning. The Math, Science and Learning Technology doctoral program prepares graduate students to improve the learning and instruction of Science, Technology, Engineering, and Mathematics (STEM) disciplines. To achieve that goal, we are deeply committed to research and scholarship, using both basic and applied research. We put a premium on developing principled approaches to affect educational practice and pursuing rigorous theory building about educational phenomena. We apply such knowledge in developing state-of-the-art instructional designs. These efforts grow from an understanding of educational practice and close work with practitioners in both formal and informal learning settings. Importantly we recognized that certain social groups have been historically marginalized from STEM disciplines, education, and work. We seek to understand the processes and structures contributing to the systematic exclusion of these groups and to actively contribute to correcting such inequities. Our work draws from a variety of disciplines including cognitive science, sociology, anthropology, the learning sciences, psychology, and computer science.

Features—In the masters program, we consider media and technology both as tools in learning and teaching specific disciplines (e.g., mathematics and science) and as objects of study in and of themselves. With regard to the former, and in line with the affiliated faculty's expertise, students explore the educational uses of a variety of technological forms (e.g., robotics systems for learning engineering, physics, programing, and the arts) and computer-based environments (e.g., software systems for learning scientific image processing). As for the latter, students actively engage in designing and using various learning technologies and media, including web-based environments, computer-mediated communications systems, computer-based virtual worlds, and new media for new literacies. The features of the doctoral program of study are: * provide an interconnected locus of intellectual activity for graduate students and faculty; * increase equity (in gender, ethnicity, and opportunities) in recruitment, admission, and retention of students and faculty and pursue issues of equity in science education; * teach relevant courses, seminars, and independent studies in mathematics and science education; * conduct pertinent research studies in mathematics and science learning, teaching, curriculum development, and assessment; * build a base of scholarship, disseminate new knowledge, and apply it actively in education; * provide apprenticeship opportunities for graduate students; * understand and support effective practice in mathematics and science education; * coordinate outreach efforts with K-12 schools and related projects; * collaborate with faculty in the Department, School, and University as well as in the wider profession throughout the Commonwealth of Massachusetts, nationally, and internationally.

Admission Requirements—For the masters program—GPA of 2.75 or higher, TESOL test score of 80 points or higher, excellent letters of recommendation, clear statement of purpose. For the doctoral program—earned masters degree in math, natural sciences, learning technology or education, GPA of 2.75 or higher, TESOL test score of 80 points or higher, excellent letters of recommendation, clear statement of purpose.

Degree Requirements—Masters degree—33 credit hours and thesis. Doctoral degree—36 credit hours beyond the masters degree, 18 dissertation credit hours, successful completion of comprehensive exams, successful completion of doctoral dissertation.

Number of Full Time Faculty—8; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—8; PhD—1; Other—0

Name of Institution—Oakland University

Name of Department or Program—Master of Training and Development Program

Address:
2200 North Squirrel Road
Rochester, MI
48309-4494
USA

Phone Number—248 370-4171 Fax Number—248 370-4095

Email Contact—ouhrdmtd@gmail.com URL—http://www2.oakland.edu/sehs/hrd/

Contact Person—Dr. Chaunda L. Scott, Graduate Coordinator

Specializations—The Master of Training and Development Program at Oakland University provides a unique blend of knowledge and skills in all aspects of training and development. Students can choose between two area of emphasis: * Instructional Design and Technology * Organizational Development and Leadership

Features—The Master of Training and Development Program develops practitioners with the knowledge and skills required to enhance individual performance. Graduates of the program will be able to lead interventions associated with diagnosing performance problems and opportunities. Graduates will also be able to design and implement individual and organizational solutions and evaluate results. All courses are taught by outstanding faculty who have diverse backgrounds and experience in business and academia. The Master of Training and Development Program and be completed in two and one half years. Graduates of the program will be qualified to work as human resource development professionals including directors of training centers, organizational development consultants, instructional designers, and performance technologists.

Admission Requirements—Official transcripts for undergraduate and graduate coursework showing a bachelors degree from a regionally accredited institution and a cummulative GPA of 3.0 or higher. A formal statement, between 100 and 1,500 words, highlighting work and life experience—preferably 1 year or longer that have led to desire to pursue the Master of Training and Development Degree. Three letters of recommendations to attest to the quality and scope of the applicant's academic and professional ability and an interview will be required.

Degree Requirements—The completion of 36 credits approved credits with an overall GPA of 3.0 or better and a grade of 2.8 or above in each additional course. The completion of five core courses is also required; HRD 530 Instructional Design, HRD 506 Theoretical Foundations of Training and Development, HRD 507 Needs Assessment, HRD 605 Program Evaluation, and HRD 611 Program Administration along with 4 elective courses.

Number of Full Time Faculty—4; Number of Other Faculty—4

Degrees awarded in 2011–2012 Academic Year—Masters—27; PhD—0; Other—0

Name of Institution—University of Michigan

Name of Department or Program—Department of Educational Studies

Address:
610 East University
Ann Arbor, MI
48109-1259
USA

Phone Number—734-763-9497 Fax Number—734-763-9497

Email Contact—quintana@umich.edu URL—http://www.soe.umich.edu/academics/doctoral_programs/lt/

Contact Person—Chris Quintana

Specializations—Ph.D. in Learning Technologies M.A. in Educational Studies with a focus on Digital Media & Education

Features—The Learning Technologies Program at the University of Michigan integrates the study of technology with a focus in a substantive content area. A unique aspect of the program is that your learning and research will engage you in real-world educational contexts. You will find that understanding issues related to a specific content area provides an essential context for meaningful research in learning. Your understanding of technology, school contexts, and a content area will place you among the leaders who design and conduct research on advanced technological systems that change education and schooling. The Doctoral specialization in Learning Technologies must be taken in conjunction with a substantive concentration designed in consultation with your advisor. Current active concentrations include: Science, Literacy, Culture and Gender, Teacher Education, Design and Human–Computer Interaction, Policy, and Social Studies. Other areas are possible. The Masters Degree in Educational Studies with a focus on Digital Media & Education at the University of Michigan prepares professionals for leadership roles in the design, development, implementation, and research of powerful technologies to enhance learning. Our approach to design links current knowledge and research about how people learn with technological tools that enable new means of organizing and evaluating learning environments. Course and project work reflects the latest knowledge and practice in learning, teaching, and technology. Core courses prepare students to use current understandings about learning theory, design principles, research methodologies, and evaluation strategies in educational settings ranging from classrooms to web-based and distributed learning environments. Faculty work with students to shape programs that meet individual interests. Practical experience is offered through internships with area institutions.

Admission Requirements—GRE, B.A. for M.A., or Ph.D.; TOEFL (minimum score of 84) for students from countries where English is not the primary language

Degree Requirements—M.A.: 30 h beyond B.A. Ph.D.: 60 h beyond B.A. or 30 h beyond Masters plus research paper/qualifying examination, and dissertation.

Number of Full Time Faculty—3; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—5; PhD—2; Other—0

Name of Institution—University of Missouri—Columbia

Name of Department or Program—School of Information Science & Learning Technologies

Address:
303 Townsend Hall
Columbia, MO
65211
USA

Phone Number—573-882-4546 Fax Number—573-884-2917

Email Contact—sislt@missouri.edu URL—http://edtech.missouri.edu/index.html

Contact Person—John Wedman

Specializations—The Educational Technology emphasis area prepares educators and technologists for excellence and leadership in the design, development, and implementation of technology in education, training, and performance support. The program offers three focus areas: Technology In Schools Learning Systems Design & Development Online Educator. Each focus area has its own set of competencies, coursework, and processes.

Features—All three focus areas are available online via the Internet or on the MU campus. The Online Educator program of study will help you develop the knowledge and skills needed to design and provide effective online learning experiences in a variety of settings. In this focus area you will: Design online learning activities for meaningful learning. Promote student engagement in online learning environments. Select appropriate technology and learning objects to support online learners. Use Learning Management Systems to support and deliver online learning. Find and evaluate Internet-based resources to enhance online learning. The Learning Systems Design & Development (LSDD) focus area prepares you to plan and create learning and performance support systems and resources. The Program is available ONLINE and several courses are offered every semester. In this focus area you will: Conduct needs assessment and evaluating learning systems. Design learning environments, including systems for direct instruction, constructivist learning, collaborative work, and performance support. Develop learning systems applications or components of applications. The Technology in the Schools focus area prepares you to use plan and implement advanced technologies in classrooms and other learning environments. In this focus area you will engage in professional growth and leadership to: Facilitate and inspire student learning and creativity. Design and develop digital-age learning experiences and assessments. Model digital-age work, learning, and technology leadership. Promote and model digital citizenship and responsibility. Ed.S. and Ph.D. programs are also available.

Admission Requirements—Bachelors degree with 3.0 in last 60 credit hours of course work. GRE (V > 156; A > 146; W > 3.5) TOEFL of 500 paper-based (61 Internet-based test) (if native language is not English) Letters of reference

Degree Requirements—Masters: 30 credit hours; 15 h at or above the 8,000 level. Specific course requirements vary by focus area.

Number of Full Time Faculty—9; Number of Other Faculty—0

Degrees awarded in 2011–2012 Academic Year—Masters—40; PhD—4; Other—21

Name of Institution—University of North Carolina, Wilmington

Name of Department or Program—Master of Science in Instructional Technology—Dept. of Instructional Technology, Foundations & Secondary Education

Address:
601 South College Rd.
Wilmington, NC
28403
USA

Phone Number—910-962-4183 Fax Number—910-962-3609

Email Contact—moallemm@uncw.edu URL—http://www.uncw.edu/ed/mit

Contact Person—Mahnaz Moallem

Specializations—The Master of Science degree in Instructional Technology (MIT) program provides advanced professional training for teachers and school technology coordinators; business and industry personnel such as executives, trainers, and human resource development employees; persons in the health care field; and community college instructors. The program focuses on the theory and practice of design and development, utilization, management, and evaluation of processes and resources for learning. It emphasizes product development and utilization of advanced technology and provides applied training in the total design, development, implementation, and evaluation of educational and training programs.

Features—As an exciting and innovative program, MIT provides students the opportunity to gain skills and knowledge from educational and applied psychology, instructional systems design, computer science, systems theory, and communication theory, allowing for considerable flexibility to tailor individual needs across other academic disciplines. Students from diverse fields can plan programs which are consistent with their long-range academic and professional goals. MIT courses are offered both on campus and online, allowing professionals to earn their degrees and/or certificates by taking MIT on-campus courses, MIT online courses, or a combination of both types. In addition, the MIT program is directed toward preparing students to function in a variety of roles to be performed in a broad range of settings, including business and industry, human services, health institutions, higher education, government, military, and public and private K-12 education.

Admission Requirements—Students desiring admission into the graduate program in instructional technology must present the following: A bachelors degree from an accredited college or university or its equivalent from a foreign institution of higher education based on a 4-year program. A strong academic record (an average GPA of 3.0 or better is expected) in the basic courses required in the area of the proposed graduate study. Academic potential as indicated by satisfactory performance on standardized test scores (e.g., Miller Analogy Test or Graduate Record Examination). The MAT or GRE must have been taken within the last 5 years. Three recommendations from individuals who are in a position to evaluate the students' professional competence as well as potential for graduate study. A statement of career goals and degree objectives. A letter describing educational and professional experiences, their reasons for pursuing graduate study, and the contributions that the student hopes to make after completing the degree. North Carolina essential and advanced technology competencies. Individuals who fall below a specified criterion may be admitted if other factors indicate potential for success. Individuals with identified deficiencies may be accepted provisionally with specified plans and goals for the remediation of those deficiencies. Such remediation may include a requirement of additional hours beyond those normally required for the degree.

Degree Requirements—Applicants should submit the following to the UNCW Graduate School: Official graduate application (Use the following link https://app.applyyourself.com/?id=uncw-grad to apply electronically). Official transcripts of all college work (undergraduate and graduate). The transcripts should be mailed directly to UNCW Graduate School. Official scores on the Miller Analogy Test (MAT) or Graduate Record Examination (GRE). Scores more than 5 years old will not be accepted. The UNCW institution code for the MAT and GRE is 5,907. Three recommendations from individuals in professionally relevant fields, addressing the applicant's demonstrated academic skills and/or potential for successful graduate study. Evidence of a bachelors degree at the time of entrance. International students: TOEFL score of 550 or higher or IELTS (International English Language Testing System) score of 217 or better (computerized test), 550 or better (paper test), or a minimum score of 79 on the Internet-based test (TOEFL iBT) or IELTS minimum score of 6.5 or 7.0 to be eligible for a teaching assistantship. Letter of application and a statement of professional goals describing applicant's educational and professional experiences, reasons for pursuing a master's degree in instructional technology, and contributions that applicant hopes to make after degree completion.

Number of Full Time Faculty—5; Number of Other Faculty—6

Degrees awarded in 2011–2012 Academic Year—Masters—20; PhD—0; Other—0

Name of Institution—University of North Dakota

Name of Department or Program—Instructional Design & Technology

Address:
231 Centennial Drive, Stop 7189
Grand Forks, ND
58202
USA

Phone Number—701-777-3574 Fax Number—701-777-3246

Email Contact—Woei.hung@und.edu URL—http://education.und.edu/teaching-and-learning/idt/index.cfm

Contact Person—Woei Hung

Specializations—Serious Games, Game-Based Learning K-12 Technology Integration Human Performance Technology eLearning Problem-Based Learning

Features—Online Hybrid with synchronous and asynchronous learning Masters and Certificates fully available at a distance Three graduate certificates (K-12 Technology Integration; Corporate Training & Performance; e-Learning) M.S. and M.Ed. Ph.D.

Interdisciplinary studies Research Opportunities: Northern Plains Center for Behavioral Research Odegard School of Aerospace Sciences (Aviation & Radar simulators; Unmanned Aerial Systems Training)

Admission Requirements—http://education.und.edu/teaching-and-learning/idt/index.cfm

Degree Requirements—Masters: http://education.und.edu/teaching-and-learning/idt/masters.cfm Doctoral: http://education.und.edu/teaching-and-learning/idt/doctor.cfm

Number of Full Time Faculty—3; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—10; PhD—1; Other—3

Name of Institution—Valley City State University

Name of Department or Program—School of Education and Graduate Studies

Address:
101 College St
Valley City, ND
58072
USA

Phone Number—701-845-7303 Fax Number—701-845-7190

Email Contact—terry.corwin@vcsu.edu URL—http://www.vcsu.edu/graduate

Contact Person—Terry Corwin

Specializations—The Master of Education Degree has four concentrations that focus on technology and the learner. Teaching and Technology concentration Technology Education concentration Library and Information Technologies concentration Teaching English Language Learners concentration The program also offers Graduate Certificates in the following areas: Library and Information Technologies certificate Teaching English Language Learners certificate Elementary and Secondary STEM certificates

Features—This is a completely online program which focuses on how technology can be used in a school setting to enhance student learning.

Admission Requirements—(1) Baccalaureate degree with a 3.0 undergraduate GPA or a test is required. (2) Three letters of recommendation. (3) Written goals statement. (4) Resume. (5) $35 fee for application

Degree Requirements—Completion of 32–37 credits depending on concentration. Action Research Study. Final portfolio demonstrating program core values.

Number of Full Time Faculty—15; Number of Other Faculty—8

Degrees awarded in 2011–2012 Academic Year—Masters—45; PhD—0; Other—0

Name of Institution—New York Institute of Technology

Name of Department or Program—Dept. of Instructional Technology and Educational Leadership

Address:
Northern Blvd/16 61st Street
Old Westbury/New York City, New York
11568/10023
USA

Phone Number—(516)686-7777/(212)261-1529 Fax Number—(516)686-7655

Email Contact—smcphers@nyit.edu URL—http://www.nyit.edu/education

Contact Person—Sarah McPherson, Chair, Dept. of Instructional Technology and Educational Leadership

Specializations—M.S. in Instructional Technology for Educators for Educational Technology Specialist Certification, and for Professional Trainers; Certificates in Computers in Education, Teaching Twenty First Century Skills, Science Technology Engineering Mathematics (STEM); Advanced Certificate: Virtual Education; Advanced Diploma Educational Leadership and Technology for School Building and Advanced Certificate for District Leader; M.S. in Childhood Education.

Features—Courses offered in Long Island, New York City and upstate New York in partnership with NYS Teacher Centers, School Districts and related to special grant funding graduate courses. Program is offered 100 % online statewide, nationally and internationally. Technology integration in content areas for K-12 teachers; Leadership and Technology for school building and district administrators; Professional Trainer for corporate training, government and non-profit agencies. All courses are hand-on instruction in technology labs; online courses; hybrid courses; evening, weekend, and summer courses.

Admission Requirements—Bachelors degree from accredited college with 3.0 cumulative average; Advanced Diploma and Advanced Certificate require Masters for admission.

Degree Requirements—36 credits with 3.0 GPA for Master of Science, 18 credits with 3.0 GPA for Certificates; Advanced Diploma 33 credits and Advanced Certificate, 15 credits.

Number of Full Time Faculty—6; Number of Other Faculty—30

Degrees awarded in 2011–2012 Academic Year—Masters—130; PhD—0; Other—12

Name of Institution—Richard Stockton College of New Jersey

Name of Department or Program—Master of Arts in Instructional Technology (MAIT)

Address:
101 Vera King Farris Drive
Galloway, NJ
08205
USA

Phone Number—609-652-4688 Fax Number—609-626-5528

Email Contact—leej@stockton.edu URL—http://intraweb.stockton.edu/eyos/page.cfm?siteID=73&pageID=276

Contact Person—Jung Lee

Specializations—The Master of Arts in Instructional Technology offered by The Richard Stockton College of New Jersey is designed to bring the best instructional technologies into both public and corporate curricula. With a strong theoretical foundation, the degree enables graduates to use technology as a tool to enhance learning and training.

Features—The program serves (1) students who seek or will continue employment in the P-12 schools; (2) students who wish to pursue coordinator or supervisor positions in P-12 schools and districts; and (3) students seeking or holding careers in business, industry, or non-profit organizations.

Admission Requirements—Minimum 3.0 GPA, relevant experience, reference letters, and GRE General Exam scores or MAT (Miller Analogies Test scores).

Degree Requirements—11 graduate courses (33 credits) including capstone project course

Number of Full Time Faculty—3; Number of Other Faculty—5

Degrees awarded in 2011–2012 Academic Year—Masters—25; PhD—0; Other—0

Name of Institution—New York University

Name of Department or Program—Educational Technology Programs

Address:
82 Washington Square East, 6th Floor
New York, NY
10003
USA

Phone Number—(212)998-5520 Fax Number—(212)995-4041

Email Contact—ectdmdl@nyu.edu URL—http://steinhardt.nyu.edu/alt/ect

Contact Person—Christopher Hoadley (Program Director); Jan Plass (Doctoral Program Coordinator)

Specializations—M.A. in Digital Media Design for Learning, M.S. in Games for Learning, and Ph.D. in Educational Communication and Technology: for the preparation of individuals as educational media designers, developers, media producers, and/or researchers in education, business and industry, health and medicine, community services, government, museums and other cultural institutions; and to teach or become involved in administration in educational communications and educational technology or learning sciences programs in higher education, including instructional video, multimedia, Web 2.0, serious games, and simulations, interactive toys, etc. The program also offers a post-Masters 30-credit Certificate of Advanced Study in Education. The degrees emphasize design and learning sciences research in learning in all contexts throughout the lifespan, including both formal and informal/nonformal environments. Faculty research areas include technology and media in collaborative learning, medical education, language and literacy learning, global development, STEM education, early childhood education, and health education. Emphasizes theoretical foundations, especially a cognitive science and learning sciences perspective of learning and instruction, and their implications for designing media-based learning environments and materials. All efforts focus on video, multimedia, instructional television, web-based technology, and simulations and games; participation in special research and production projects and field internships. Uses an apprenticeship model to provide doctoral students and advanced M.A. students with research opportunities in collaboration with faculty.

Features—Program twitter: @ectdmdl; see http://steinhardt.nyu.edu/alt/ect/social/ for information about mailing lists, our private facebook group; also see our blog of educational technology events and jobs at http://blogs.nyu.edu/steinhardt/edtech/

Admission Requirements—M.A./M.S.: Bachelors degree or international equivalent required. Typically 3.0 undergraduate GPA, statement of purpose (no GRE required), optional portfolio. Ph.D.: Masters degree or international equivalent required. 3.0 GPA, GRE, responses to essay questions, interview related to academic or professional preparation and career goals. (TOEFL required for international students.)

Degree Requirements—M.A./M.S.: 36 semester credit hours including specialization, elective courses, thesis, English Essay Examination. Ph.D.: 57 semester credit hours beyond Masters, including specialization, foundations, research, content seminar, and elective course work; candidacy papers; dissertation; English Essay Examination. Full-time or part-time study available; *no online option available*.

Number of Full Time Faculty—4; Number of Other Faculty—4

Degrees awarded in 2011–2012 Academic Year—Masters—14; PhD—2; Other—0

Name of Institution—Syracuse University

Name of Department or Program—Instructional Design, Development, and Evaluation Program, School of Education

Address:
330 Huntington Hall
Syracuse, NY
13244-2340
USA

Phone Number—(315)443-3703 Fax Number—(315)443-1218

Email Contact—nlsmith@syr.edu URL—http://idde.syr.edu

Contact Person—Nick Smith, Professor and Department Chair

Specializations—Certificates in Educational Technology and Adult Lifelong Learning, M.S., M.S. in Instructional Technology, C.A.S., and Ph.D. degree programs in Instructional Design, Educational Evaluation, Human Issues in Instructional Development, Technology Integration, and Educational Research and Theory (learning theory, application of theory, and educational media research). Graduates are prepared to serve as curriculum developers, instructional designers, program and project evaluators, researchers, resource center administrators, technology coordinators, educational technology specialist, distance learning design and delivery specialists, trainers and training managers, and higher education faculty.

Features—The courses and programs are typically project centered. Collaborative project experience, field work, and internships are emphasized throughout. There are special issue seminars, as well as student- and faculty-initiated mini-courses, seminars, and guest lecturers, faculty-student formulation of department policies, and multiple international perspectives. International collaborations are an ongoing feature of the program. The graduate student population is highly diverse.

Admission Requirements—Certificates and M.S.: undergraduate transcripts, recommendations, personal statement, interview recommended; TOEFL for international applicants; GRE recommended. Certificate of Advanced Study: Relevant Masters degree from accredited institution or equivalent, GRE scores, recommendations, personal statement, TOEFL for international applicants; interview recommended. Doctoral: Relevant Masters degree from accredited institution or equivalent, GRE scores, recommendations, personal statement, TOEFL for international applicants; interview strongly encouraged.

Degree Requirements—Certificates: 15 and 24 semester hours. M.S.: 36 semester hours, portfolio required. M.S. in Instructional Technology: 37 semester hours, practicum, and portfolio required. C.A.S.: 60 semester hours, exam and project required. Ph.D.: 90 semester hours, research apprenticeship, portfolio, qualifying exams, and dissertation required.

Number of Full Time Faculty—4; Number of Other Faculty—6

Degrees awarded in 2011–2012 Academic Year—Masters—9; PhD—2; Other—2

Name of Institution—East Stroudsburg University

Name of Department or Program—Instructional Technology: Media Communication and Technology Department

Address:
200 Prospect Street
East Stroudsburg, PA
18301
USA

Phone Number—470 422 3621 Fax Number—(570) 422-3876

Email Contact—bsockman@po-box.esu.edu URL—http://www.esu.edu/gradmcom

Contact Person—Beth Rajan Sockman

Specializations—Mission: The graduate programs are designed to prepare instructional technologists to utilize critical reflection with research in order to design, produce, and implement technological tools to improve learning in a global society. Instructional Technology Students can obtain a Masters of Education degree in Instructional Technology and/or a Pennsylvania Instructional Technologist Specialist Certificate. Students interested in PK-12 education may choose to concentrate on Technology Integration. Instructional technologist can be prepared for 5 areas: * PK-12 Educators: technology literacy of educators and specialists to work in K-12 schools, school districts, or instructional technology personnel in education. * Edu-business Entrepreneurs: technology to facilitate learning in customized learning environments. * Instructional Designer: technology and instructional designer in the business, training, or cooperate environment. * Higher Education Technology Integrators: learning management systems and work with faculty SMEs for technology integration into their curriculum.

Features—The program provides students with an opportunity to take courses from ESU University. Students who successfully complete the program become proficient in using technology in teaching. Students can choose courses that explore that following areas: * Interactive web design (Including Web 2.0 applications) * Convergence of Technology * Desktop publishing * Graphics * Video * New and emerging technologies * Instructional design * Learning theories * Research in Instructional Technology

Admission Requirements—For M.Ed. degree: * Two letters of recommendation * Portfolio or interview (Interview is granted after the application is received) * For full admission, a minimum overall undergraduate 2.5 QPA For certification: * Contact the graduate coordinator for additional admission information to comply with Pennsylvania Department of Education requirements. * Minimum overall undergraduate QPA 3.0 (Pennsylvania Act 354) * If not 3.0 QPA, then completion of nine credits of Media Communication and Technology Department courses with prior written approval of department faculty adviser * Two letters of recommendation * Rolling deadline

Degree Requirements—Total = 33 credits # Take courses and learn—Take 30 credits of courses for the masters and learn based on your needs. You will learn to use and implement technologies outside an average person's experience. # Create, Submit, and Present your Portfolio—This is the time to display your learning in a professional manner. In the portfolio you articulate your goals and may identify learning goals for your internship. Click here for the Portfolio Guidelines. # Complete an Internship—You complete a 90 h internship that extends your knowledge base—3 credits. # Complete Portfolio and Graduate

Number of Full Time Faculty—7; Number of Other Faculty—4

Degrees awarded in 2011–2012 Academic Year—Masters—9; PhD—0; Other—0

Name of Institution—University of Memphis

Name of Department or Program—Instructional Design and Technology

Address:
406 Ball Hall
Memphis, TN
38152
USA

Phone Number—901-678-5672 Fax Number—901-678-3881

Email Contact—treymartindale@gmail.com URL—http://idt.memphis.edu

Contact Person—Dr. Trey Martindale

Specializations—Instructional Design, Educational Technology, Technology Integration, Web 2.0 and Social Media, Web-Based Instruction, E-Learning, Computer-Based Instruction, Mobile Learning, Professional Development, Consulting

Features—Twitter: https://twitter.com/#!/umidt Facebook: http://www.facebook.com/idtmemphis IDT Program News: http://idtmemphis.wordpress.com/ Our masters degree is 30 credit hours and is completely online. The IDT Studio (http://idtstudio.org), staffed and run by IDT faculty and students, serves as an R&D space for coursework and research involving technologies such as digital media, WBT/CBT, pedagogical agents, gaming, and simulation. The IDT program and IDT Studio are connected to the Center for Multimedia Arts in the FedEx Institute of Technology. The IDT Studio brings in outside contract work from corporate partners to provide real-world experience to students. The IDT program is an active partner in the Martin Institute for Teaching Excellence (http://martininstitute.org). We have also partnered with the Institute for Intelligent Systems and the Tutoring Research Group (http://www.autotutor.org) to work on intelligent agent development and research.

Admission Requirements—An official transcript showing a bachelors degree awarded by an accredited college or university with a minimum GPA of 2.0 on a 4.0 scale, competitive MAT or GRE scores, GRE writing test, two letters of recommendation, graduate school, and departmental application. Doctoral students must also be interviewed by at least two members of the program.

Degree Requirements—M.S.: 30 h total. Internship, masters project or thesis, 3.0 GPA. Ed.D: 54 h total. 45 in major, 9 in research; residency project; comprehensive exams; dissertation.

Number of Full Time Faculty—6; Number of Other Faculty—8

Degrees awarded in 2011–2012 Academic Year—Masters—8; PhD—4; Other—3

Name of Institution—University of Texas at Brownsville

Name of Department or Program—Educational Technology

Address:
80 Fort Brown
Brownsville, TX
78520
USA

Phone Number—(956) 882-7540 Fax Number—(956) 882-8929

Email Contact—Rene.Corbeil@UTB.edu URL—http://edtech.utb.edu

Contact Person—J. Rene Corbeil, Ed.D.

Specializations—E-Learning Instructional Design Web-Based Instruction Multimedia Design

Features—The Online M.Ed. in Educational Technology is a 36-h program designed to prepare persons in K-12, higher education, corporate, and military settings to develop the skills and knowledge necessary for the classrooms of tomorrow. Graduates of this program will have a much better understanding of the uses of technology and how they can be applied in instructional/training settings. The program focuses on the theory, research, and applications related to the field of educational technology and is intended to help individuals: use instructional technology (computers, telecommunications, and related technologies) as resources for the delivery of instruction—serve as facilitators or directors of instructional technology in educational settings and/or be developers of instructional programs and materials for new technologies—design instructional materials in a variety of media. In addition to earning an M.Ed. in Educational Technology, students working in K-12 environments also have the opportunity to complete the Master Technology Teacher (MTT) Program and test for the MTT Certificate. The program is provided through the four MTT elective courses offered as an option in the degree program. An E-Learning Certificate is also available for individuals working in higher education or at e-learning industries.

Admission Requirements—Proof of a baccalaureate degree from a 4-year institution which has regional accreditation. GPA of 2.5 or higher. (3.0 GPA for “unconditional” admission. Between 2.5 and 2.9 for “conditional” admission).

Application Essay/Statement of Goals. Please provide a carefully considered statement of: (1) your academic and professional objectives and (2) explain how graduate study will help you to attain your goals. Note: The GRE is not required for students with undergraduate GPAs above 3.0.

Degree Requirements—The M.Ed. in Educational Technology consists of 27 h from core courses plus 9 h of electives for a total of 36 h. Students can select the 9 h of electives based upon their professional needs and academic interests (e.g., Master Technology Teacher—MTT Certificate, e-Learning Certificate, or 12 h in a specific content area such as reading, mathematics, science) with advisor approval. Core Courses: (24 h) EDTC 6320—Educational Technology EDTC 6321—Instructional Design EDTC 6323—Multimedia/Hypermedia EDTC 6325—Educational Communications EDTC 6329—Selected Topics in Educational Technology EDTC 6332—Practicum in Educational Technology EDFR 6300—Foundations of Research in Education EPSY 6304—Learning and Cognition EDFR 6388—Socio Cultural Foundations Electives: (9 h) EDCI 6301—Instructional Technology in Teaching EDCI 6336—Problems in Education: International Technology Issues EDTC 6340—Applications of Advanced Technologies in the Pk-12 Classroom EDTC 6341—Student-Centered Learning Using Technology EDTC 6342—Technology Leadership EDTC 6343—Master Teacher of Technology Practicum* EDTC 6351—Web-Based Multimedia in Instruction EDTC 6358—Theory and Practice of e-Learning

Number of Full Time Faculty—4; Number of Other Faculty—2

Degrees awarded in 2011–2012 Academic Year—Masters—42; PhD—0; Other—0

Name of Institution—Old Dominion University

Name of Department or Program—Instructional Design & Technology

Address:
Education 228
Norfolk, VA
23529
USA

Phone Number—757-683-6275 Fax Number—757-683-5862

Email Contact—gmorriso@odu.edu URL—http://education.odu.edu/eci/idt/

Contact Person—Gary R. Morrison

Specializations—Our faculty engages students in a rigorous course of study tailored to meet individual educational and career interests. Research opportunities and course work ensures that all students receive a solid foundation in Instructional Design Instructional Design Theory Human Performance Technology Gaming and Simulation Distance Education Evaluation & Assessment Trends and Issues in Instructional Technology Quantitative and Qualitative Research

Features—All of our courses are offered via distance using a hybrid format. Classroom instruction uses a virtual classroom that allows all students to participate in a face-to-face classroom. A reduced tuition rate is available for students living outside of Virginia who are accepted into the program.

Admission Requirements—M.S. degree: GRE scores or MAT scores; transcripts for undergraduate and graduate courses Ph.D.: GRE scores, transcripts for undergraduate and graduate courses, letters of recommendation, and an essay describing professional goals.

Degree Requirements—M.S. program is 30–36 h Ph.D. program is a post-master degree consisting of 60 h

Number of Full Time Faculty—4; Number of Other Faculty—1

Degrees awarded in 2011–2012 Academic Year—Masters—3; PhD—3; Other—0

Name of Institution—Concordia University Wisconsin

Name of Department or Program—Educational Design and Technology

Address:
12800N Lakeshore Drive
Mequon, WI
53092
USA

Phone Number—262-243-4595 Fax Number—262-243-3595

Email Contact—bernard.bull@cuw.edu URL—http://www.cuw.edu/go/edtech

Contact Person—Dr. Bernard Bull

Specializations—Digital culture, designing digital age learning experiences, and social/spiritual/ethical implications of technology.

Features—Courses are available via e-learning or face-to-face. Some cohorts are also offered at off-campus sites in Wisconsin and beyond. In addition, we run occasional thematic cohorts where a group of students work through the program together over an 18–24 month period, all agreeing to focus their thesis or culminating project upon the cohort theme (e.g., new literacies, bridging the digital divide, global education, discipleship in the digital age).

Admission Requirements—To be considered for admission, a student must: Have a bachelors degree from an accredited college or university. Have a minimum GPA of 3.00 in the undergraduate program.

Degree Requirements—Required Courses EDT 970—Integrating Technology in the Classroom (3) EDT 889—Applying Technology in the Content Areas (3) EDT 908—Critical Issues in Educational Technology (3) EDT 892—Instructional Design (3) EDT 893—Theories of Learning and Design (3) EDT 815—Research in Educational Technology (3) EDT 927, 928, 929—Portfolio I, II, and III (0) EDT

895—Capstone Project (3) OR EDT 890—Thesis Completion Seminar (3) Electives EDT 805—Online Teaching and Learning (3) EDT 814—Educational Ministry in the Digital World (3) EDT 894—Digital Literacy (3) EDT 907—Multimedia for the Classroom (3) EDT 939—School Leadership in Technology (3) EDT 851—Support and Troubleshooting for Teaching and Learning with Technology (3) EDT 957—Building Online Learning Communities (Web 2.0/Learning 2.0) (3) EDT 971—Grants and Funding for Educational Technology Initiatives (3) EDT 804—Strategies for Teaching and Learning with Interactive Whiteboards (1) EDT 945—Readings in Educational Design and Technology EDT 815—Innovation in Education Other electives as approved by the program director.

Number of Full Time Faculty—4; Number of Other Faculty—8
Degrees awarded in 2011–2012 Academic Year—Masters—23; PhD—0; Other—0

There are a total of 100 graduate programs in the database.

Part VI
Mediagraphy

Chapter 18
Introduction

Jinn-Wei Tsao

Contents

This resource lists journals and other resources of interest to practitioners, researchers, students, and others concerned with educational technology and educational media. The primary goal of this section is to list current publications in the field. The majority of materials cited here were published in 2011 or mid-2012. Media-related journals include those listed in past issues of EMTY, as well as new entries in the field. A thorough list of journals in the educational technology field has been updated for the 2012 edition using Ulrich's Periodical Index Online and journal websites. This chapter is not intended to serve as a specific resource location tool, although it may be used for that purpose in the absence of database access. Rather, readers are encouraged to peruse the categories of interest in this chapter to gain an idea of recent developments within the field. For archival purposes, this chapter serves as a snapshot of the field of instructional technology publications in 2011. Readers must bear in mind that technological developments occur well in advance of publication and should take that fact into consideration when judging the timeliness of resources listed in this chapter.

Selection

Items were selected for the Mediagraphy in several ways. The EBSCO Host Databases were used to locate most of the journal citations. Others were taken from the journal listings of large publishing companies. Items were chosen for this list when they met one or more of the following criteria: reputable publisher, broad

J.-W. Tsao (✉)
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e-mail: miketsao@uga.edu

M. Orey et al. (eds.), *Educational Media and Technology Yearbook*, Educational Media and Technology Yearbook 38, DOI 10.1007/978-3-319-06314-0_18,

circulation, coverage by indexing services, peer review, and coverage of a gap in the literature. The author chose items on subjects that seem to reflect the instructional technology field as it is today. Because of the increasing tendency for media producers to package their products in more than one format and for single titles to contain mixed media, titles are no longer separated by media type. The author makes no claims as to the comprehensiveness of this list. It is, instead, intended to be representative.

Obtaining Resources

Media-related periodicals: The author has attempted to provide various ways to obtain the resources listed in this Mediagraphy, including telephone and fax numbers, Web and postal addresses, as well as email contacts. Prices are also included for student, individual, and institutional subscriptions. The information presented reflects the most current information available at the time of publication.

ERIC Documents: As of December 31, 2003, ERIC was no longer funded. However, ERIC documents can still be read and copied from their microfiche form at any library holding an ERIC microfiche collection. The identification number beginning with ED (for example, ED 332 677) locates the document in the collection. Document delivery services and copies of most ERIC documents can also continue to be available from the ERIC Document Reproduction Service. Prices charged depend on format chosen (microfiche or paper copy), length of the document, and method of shipping. Online orders, fax orders, and expedited delivery are available.

To find the closest library with an ERIC microfiche collection, contact: ACCESS ERIC, 1600 Research Blvd, Rockville, MD 20850-3172, USA; (800) LET-ERIC (538-3742); email: acceric@inet.ed.gov.

To order ERIC documents, contact:

ERIC Document Reproduction Services (EDRS)
7420 Fullerton Rd, Suite 110, Springfield, VA 22153-2852, USA
(800) 433-ERIC (433-3742); (703) 440-1400
Fax: (703) 440-1408
Email: service@edrs.com.

Journal articles: Photocopies of journal articles can be obtained in one of the following ways: (1) from a library subscribing to the title, (2) through interlibrary loan, (3) through the purchase of a back issue from the journal publisher, or (4) from an article reprint service such as ProQuest Microfilm.

ProQuest Microfilm, 789 E. Eisenhower Parkway, P.O. Box 1346
Ann Arbor, MI 48106-1346, USA
(734) 761-4700
Fax: (734) 997-4222
Email: sandra.piver@proquest.com.

Journal articles can also be obtained through the Institute for Scientific Information (ISI).

ISI Document Solution
P.O. Box 7649
Philadelphia, PA 19104-3389, USA
(800) 336-4474, option 5
Fax: (215) 222-0840 or (215) 386-4343
Email: ids@isinet.com.

Arrangement

Mediagraphy entries are classified according to major subject emphasis under the following headings:

- Artificial Intelligence, Robotics, and Electronic Performance Support Systems
- Computer-Assisted Instruction
- Distance Education
- Educational Research
- Educational Technology
- Information Science and Technology
- Instructional Design and Development
- Learning Sciences
- Libraries and Media Centers
- Media Technologies
- Professional Development
- Simulation, Gaming, and Virtual Reality
- Special Education and Disabilities
- Telecommunications and Networking

Chapter 19
Mediagraphy

Jinn-Wei Tsao

Artificial Intelligence, Robotics, and Electronic Performance Support Systems

Artificial Intelligence Review. Springer Science + Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/10462, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [8/yr; $862 inst (print/online), $1034 inst (print + online, content through 1997)] Publishes reports and evaluations, as well as commentary on issues and development in artificial intelligence foundations and current research.

AI Magazine. Association for the Advancement of Artificial Intelligence, 2275 East Bayshore Road, Suite 160, Palo Alto, California 94303. http://www.aaai.org/Magazine, tel: 650-328-3123, fax: 650-321-4457, info08@aaai.org [4/yr; $70 stud, $140 indiv, $280 inst] Proclaimed "journal of record for the AI community," this magazine provides full-length articles on new research and literature, but is written to allow access to those reading outside their area of expertise.

International Journal of Robotics Research. Sage Publications, 2455 Teller Rd, Thousand Oaks, CA 91320. ijr.sagepub.com, tel: 800-818-7243, fax: 800-583-2665, journals@sagepub.com [14/yr; $216 indiv, $2091 inst (print), $1921 inst (online), $2134 inst (online + backfile, content through Volume 1, Issue 1/print + online), $2347 inst (print + online + backfile)] Interdisciplinary approach to the study of robotics for researchers, scientists, and students. The first scholarly publication on robotics research.

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M. Orey et al. (eds.), *Educational Media and Technology Yearbook*, Educational Media and Technology Yearbook 38, DOI 10.1007/978-3-319-06314-0_19,

Journal of Intelligent and Robotic Systems. Springer Science + Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/10846, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [16/yr; $2322 inst (print/online), $2786 inst (print + online, content through 1997)] Main objective is to provide a forum for the fruitful interaction of ideas and techniques that combine systems and control science with artificial intelligence and other related computer science concepts. It bridges the gap between theory and practice.

Journal of Interactive Learning Research. Association for the Advancement of Computing in Education, PO Box 1545, Chesapeake, VA 23327-1545. http://www.aace.org/pubs/jilr, tel: 757-366-5606, fax: 703-997-8760, info@aace.org [4/yr; $45 for stud, $125 indiv, $195 inst] Publishes articles on how intelligent computer technologies can be used in education to enhance learning and teaching. Reports on research and developments, integration, and applications of artificial intelligence in education.

Knowledge-Based Systems. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/knosys, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [12/yr; $226 indiv, $1481 inst] Interdisciplinary applications-oriented journal on fifth-generation computing, expert systems, and knowledge-based methods in system design.

Minds and Machines. Springer Science + Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/11023, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [4/yr; $834 inst (print/online), $1001 inst (print + online, content through 1997)] Discusses issues concerning machines and mentality, artificial intelligence, epistemology, simulation, and modeling.

Computer-Assisted Instruction

AACE Journal. Association for the Advancement of Computing in Education, PO Box 1545, Chesapeake, VA 23327-1545. http://www.editlib.org/j/aacej, tel: 757-366-5606, fax: 703-997-8760, info@aace.org [4/yr; $45 for stud, $125 indiv, $195 inst] Publishes articles dealing with issues in instructional technology.

CALICO Journal. Computer-Assisted Language Instruction Consortium, 214 Centennial Hall, Texas State Univ, San Marcos, TX 78666. calico.org, tel: 512-245-1417, fax: 512-245-9089, info@calico.org [3/yr; $40 stud, $50K-12 or community college teacher, $65 indiv, $105 inst] Provides information on the applications of technology in teaching and learning languages.

Children's Technology Review. Active Learning Associates, 120 Main St, Flemington, NJ 08822. childrenstech.com, tel: 800-993-9499, fax: 908-284-0405, lisa@childrenstech.com [12/yr; $30 online, $120 print + online] Provides reviews and other information about software to help parents and educators more effectively use computers with children.

Computers and Composition. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/compcom, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [4/yr; $82 indiv, $454 inst] International journal for teachers of writing that focuses on the use of computers in writing instruction and related research.

Computers & Education. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/compedu, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [8/yr; $404 indiv, $2139 inst] Presents technical papers covering a broad range of subjects for users of analog, digital, and hybrid computers in all aspects of higher education.

Computers in Education Journal. American Society for Engineering Education, Port Royal Square, PO Box 68, Port Royal, VA 22535. http://www.asee.org/papers-and-publications/publications/division-publications/computers-in-education-journal, tel: 804-742-5611, fax: 804-742-5030, ed-pub@crosslink.net [4/yr; $20 stud, $69 indiv, inst prices vary] Covers transactions, scholarly research papers, application notes, and teaching methods.

Computers in Human Behavior. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/comphumbeh, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [6/yr; $317 indiv, $1756 inst] Scholarly journal dedicated to examining the use of computers from a psychological perspective.

Computers in the Schools. Taylor & Francis Group, Customer Service Dept, 325 Chestnut Street, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/07380569, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $125 indiv (online), $134 indiv (print + online), $699 inst (online), $777 inst (print + online)] Features articles that combine theory and practical applications of small computers in schools for educators and school administrators.

Converge. e.Republic, Inc., 100 Blue Ravine Rd, Folsom, CA 95630. http://www.convergemag.com, tel: 800-940-6039 ext 1319, fax: 916-932-1470, subscriptions@convergemag.com [4/yr; free] Explores the revolution of technology in education.

Dr. Dobb's Journal. United Business Media LLC, Customer Service, PO Box 1093, Skokie, IL 60076. http://www.ddj.com, tel: 888-664-3332, fax: 847-763-9606, drdobbsjournal@halldata.com [12/yr; free to qualified applicants] Articles on the latest in operating systems, programming languages, algorithms, hardware design and architecture, data structures, and telecommunications; in-depth hardware and software reviews.

eWEEK. Ziff Davis Media Inc., PO Box 3402, Northbrook, IL 60065-3402. http://www.eweek.com, tel: 888-663-8438, fax: 847-564-9453, eweek@ziffdavis.com [36/yr; $125 (print), $85 (online), free to qualified applicants] Provides current information on the IBM PC, including hardware, software, industry news, business strategies, and reviews of hardware and software.

Instructor. Scholastic Inc., PO Box 420235, Palm Coast, FL 32142-0235. teacher.scholastic.com/products/instructor, tel: 866-436-2455, fax: 212-343-4799, instructor@emailcustomerservice.com [8/yr; $8] Features articles on applications and advances of technology in education for K-12 and college educators and administrators.

Interactive Learning Environments. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/10494820, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [5/yr; $240 indiv, $713 inst (online), $793 inst (print + online)] Explores the implications of the Internet and multimedia presentation software in education and training environments.

Journal of Computer Assisted Learning. John Wiley & Sons, Inc., Journal Customer Services, 350 Main St, Malden, MA 02148. http://www.blackwellpublishing.com/journals/JCA, tel: 800-835-6770, fax: 781-388-8232, cs-agency@wiley.com [6/yr; $230 indiv (print + online), $1404 inst (print/online), $1615 inst (print + online)] Articles and research on the use of computer-assisted learning.

Journal of Educational Computing Research. Baywood Publishing Co., Inc., 26 Austin Ave, Box 337, Amityville, NY 11701-0337. http://www.baywood.com/journals/previewjournals.asp?id=0735-6331, tel: 800-638-7819, fax: 631-691-1770, info@baywood.com [8/yr; $235 indiv (online), $245 indiv (print + online), $598 inst (online), $630 inst (print + online)] Presents original research papers, critical analyses, reports on research in progress, design and development studies, article reviews, and grant award listings.

Journal of Educational Multimedia and Hypermedia. Association for the Advancement of Computing in Education, PO Box 1545, Chesapeake, VA 23327-1545. http://www.aace.org/pubs/jemh, tel: 757-366-5606, fax: 703-997-8760, info@aace.org [4/yr; $45 for stud, $125 indiv, $195 inst] A multidisciplinary information source presenting research about and applications for multimedia and hypermedia tools.

Journal of Research on Technology in Education. International Society for Technology in Education, 180 West 8th Ave., Suite 300, Eugene, OR 97401-2916. http://www.iste.org/jrte, tel: 800-336-5191, fax: 541-434-8948, iste@iste.org [4/yr; $54 member, $155 nonmember] Contains articles reporting on the latest research findings related to classroom and administrative uses of technology, including system and project evaluations.

Language Resources and Evaluation. Springer Science + Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/10579, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [4/yr; $901 inst (print/online), $1081 inst (print + online, content through 1997)] Contains papers on computer-aided studies, applications, automation, and computer-assisted instruction.

Learning and Leading with Technology. International Society for Technology in Education, 180 West 8th Ave., Suite 300, Eugene, OR 97401-2916. http://www.iste.org/LL, tel: 800-336-5191, fax: 541-302-3778, iste@iste.org [8/yr; $54 member, $100 non-member] Focuses on the use of technology, coordination, and leadership; written by educators for educators. Appropriate for classroom teachers, lab teachers, technology coordinators, and teacher educators.

MacWorld. Mac Publishing, Macworld Subscription Services, PO Box 37781, Boone, IA 50037. http://www.macworld.com/magazine, tel: 800-288-6848, fax: 515-432-6994, subhelp@macworld.com [12/yr; $19.97] Describes hardware, software, tutorials, and applications for users of the Macintosh microcomputer.

OnCUE. Computer-Using Educators, Inc., 877 Ygnacio Valley Road, Suite 104, Walnut Creek, CA 94596. http://www.cue.org/oncue, tel: 925-478-3460, fax: 925-934-6799, cueinc@cue.org [4/yr; $30 stud, $40 indiv] Contains articles, news items, and trade advertisements addressing computer-based education.

PC Magazine. Ziff Davis Media Inc., 28 E 28th St, New York, NY 10016-7930. http://www.pcmag.com, tel: 212-503-3500, fax: 212-503-4399, pcmag@ziffdavis.com [12/yr; $19.99] Comparative reviews of computer hardware and general business software programs.

Social Science Computer Review. Sage Publications, 2455 Teller Rd, Thousand Oaks, CA 91320. ssc.sagepub.com, tel: 800-818-7243, fax: 800-583-2665, journals@sagepub.com [4/yr; $130 indiv, $725 inst (print), $666 inst (online), $740 inst (online + backfile, content through Volume 1, Issue 1/print + online), $814 inst (print + online + backfile)] Interdisciplinary peer-reviewed scholarly publication covering social science research and instructional applications in computing and telecommunications; also covers societal impacts of information technology.

Wireless Networks. Springer Science + Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/11276, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [8/yr; $879 inst (print/online), $1055 inst (print + online, content through 1997)] Devoted to the technological innovations that result from the mobility allowed by wireless technology.

Distance Education

American Journal of Distance Education. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/08923647, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $79 indiv, $291 inst (online), $323 inst (print + online)] Created to disseminate information and act as a forum for criticism and debate about research on and practice of systems, management, and administration of distance education.

Journal of Distance Education. Canadian Network for Innovation in Education, BCIT Learning & Teaching Centre, British Columbia Institute of Technology, 3700 Willingdon Ave, Burnaby, BC, V5G 3H2, Canada. http://www.jofde.ca, tel: 604-454-2280, fax: 604-431-7267, journalofde@gmail.com [at least 2/yr; $40 (print); free online] Aims to promote and encourage scholarly work of empirical and theoretical nature relating to distance education in Canada and throughout the world.

Journal of Library & Information Services in Distance Learning. Taylor & Francis Group, Customer Service Dept, 325 Chestnut Street, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/1533290X, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $75 indiv (online), $83 indiv (print+online), $199 inst (online), $220 inst (print+online)] Contains peer-reviewed articles, essays, narratives, current events, and letters from distance learning and information science experts.

Journal of Research on Technology in Education. International Society for Technology in Education, 180 West 8th Ave., Suite 300, Eugene, OR 97401-2916. http://www.iste.org/jrte, tel: 800-336-5191, fax: 541-434-8948, iste@iste.org [4/yr; $54 member, $155 non-member] Contains articles reporting on the latest research findings related to classroom and administrative uses of technology, including system and project evaluations.

Open Learning. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/02680513, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [3/yr; $116 indiv, $343 inst (online), $382 inst (print+online)] Academic, scholarly publication on aspects of open and distance learning anywhere in the world. Includes issues for debate and research notes.

Educational Research

American Educational Research Journal. Sage Publications, 2455 Teller Rd, Thousand Oaks, CA 91320. aer.sagepub.com, tel: 800-818-7243, fax: 800-583-2665, journals@sagepub.com [6/yr; $69 indiv, $421 inst (print), $387 inst (online), $430 inst (online+backfile, content through Volume 1, Issue 1/print+online), $473 inst (print+online+backfile)] Reports original research, both empirical and theoretical, and brief synopses of research.

Educational Research. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/00131881, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $197 indiv, $542 inst (online), $602 inst (print+online)] Reports on current educational research, evaluation, and applications.

Educational Researcher. Sage Publications, 2455 Teller Rd, Thousand Oaks, CA 91320. edr.sagepub.com, tel: 800-818-7243, fax: 800-583-2665, journals@sagepub.com [9/yr; $58 indiv, $386 inst (print), $355 inst (online), $394 inst (online+backfile, content through Volume 1, Issue 1/print+online), $433 inst (print+online+backfile)] Contains news and features of general significance in educational research.

Journal of Interactive Learning Research. Association for the Advancement of Computing in Education, PO Box 1545, Chesapeake, VA 23327-1545. http://www.aace.org/pubs/jilr, tel: 757-366-5606, fax: 703-997-8760, info@aace.org [4/yr; $45 for stud, $125 indiv, $195 inst] Publishes articles on how intelligent computer technologies can be used in education to enhance learning and teaching. Reports on research and developments, integration, and applications of artificial intelligence in education.

Learning Technology. IEEE Computer Society, Technical Committee on Learning Technology, 150 Androutsou Street, Piraeus GR-18352, GREECE. lttf.ieee.org/learn_tech, tel: (+30) 210-4142766, fax: (+30) 210-4142767, sampson@unipi.gr [4/yr; free] Online publication that reports developments, projects, conferences, and findings of the Learning Technology Task Force.

Meridian. North Carolina State University, College of Education, Poe Hall, Box 7801, Raleigh, NC 27695-7801. http://www.ncsu.edu/meridian, meridian_mail@ncsu.edu [2/yr; free] Online journal dedicated to research in middle school educational technology use.

Research in Science & Technological Education. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/02635143, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [3/yr; $373 indiv, $1765 inst (online), $1961 inst (print+online)] Publication of original research in the science and technological fields. Includes articles on psychological, sociological, economic, and organizational aspects of technological education.

Educational Technology

Appropriate Technology. Research Information Ltd., Grenville Court, Britwell Rd, Burnham, Bucks, SL1 8DF, United Kingdom. http://www.researchinformation.co.uk/apte.php, tel: +44 (0) 1628 600499, fax: +44 (0) 1628 600488, info@researchinformation.co.uk [4/yr; $104 indiv, $316 inst] Articles on less technologically advanced, but more environmentally sustainable, solutions to problems in developing countries.

British Journal of Educational Technology. John Wiley & Sons, Inc., Journal Customer Services, 350 Main St, Malden, MA 02148. http://www.blackwellpublishing.com/journals/BJET, tel: 800-835-6770, fax: 781-388-8232, cs-agency@wiley.com

[6/yr; $213 indiv, $1336 inst (print/online), $1536 inst (print+online)] Published by the National Council for Educational Technology, this journal includes articles on education and training, especially theory, applications, and development of educational technology and communications.

Canadian Journal of Learning and Technology. Canadian Network for Innovation in Education (CNIE), 260 Dalhousie St., Suite 204, Ottawa, ON, K1N 7E4, Canada. http://www.cjlt.ca, tel: 613-241-0018, fax: 613-241-0019, cjlt@ucalgary.ca [3/yr; free] Concerned with all aspects of educational systems and technology.

Educational Technology. Educational Technology Publications, Inc., 700 Palisade Ave, Englewood Cliffs, NJ 07632-0564. http://www.bookstoread.com/etp, tel: 800-952-2665, fax: 201-871-4009, edtecpubs@aol.com [6/yr; $229] Covers telecommunications, computer-aided instruction, information retrieval, educational television, and electronic media in the classroom.

Educational Technology Abstracts. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/02663368, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [1/yr; $621 indiv, $1595 inst (online), $1679 inst (print+online)] An international publication of abstracts of recently published material in the field of educational and training technology.

Educational Technology Research & Development. Springer Science+Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/11423, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [6/yr; $371 inst (print/online), $445 inst (print+online, content through 1997)] Focuses on research, instructional development, and applied theory in the field of educational technology.

International Journal of Technology and Design Education. Springer Science+Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/10798, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [4/yr; $456 inst (print/online), $547 inst (print+online, content through 1997)] Publishes research reports and scholarly writing about aspects of technology and design education.

Journal of Computing in Higher Education. Springer Science+Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/12528, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [3/yr; $150 inst (print/online), $180 inst (print+online, content through 1997)] Publishes scholarly essays, case studies, and research that discuss instructional technologies.

Journal of Educational Technology Systems. Baywood Publishing Co., Inc., 26 Austin Ave, Box 337, Amityville, NY 11701-0337. http://www.baywood.com/journals/previewjournals.asp?id=0047-2395, tel: 800-638-7819, fax: 631-691-1770, info@baywood.com [4/yr; $408 inst (online), $430 (print+online)] Deals with systems in which technology and education interface; designed to inform educators who are interested in making optimum use of technology.

Journal of Interactive Media in Education. Open University, Knowledge Media Institute, Milton Keynes MK7 6AA United Kingdom. http://www-jime.open.ac.uk, tel: +44 (0) 1908 653800, fax: +44 (0) 1908 653169, jime@open.ac.uk [Irregular; free] A multidisciplinary forum for debate and idea sharing concerning the practical aspects of interactive media and instructional technology.

Journal of Science Education and Technology. Springer Science+Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/10956, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [6/yr; $1121 inst (print/online), $1345 inst (print+online, content through 1997)] Publishes studies aimed at improving science education at all levels in the USA.

MultiMedia & Internet@Schools. Information Today, Inc., 143 Old Marlton Pike, Medford, NJ 08055-8750. http://www.mmischools.com, tel: 609-654-6266, fax: 609-654-4309, custserv@infotoday.com [5/yr; $19.95] Reviews and evaluates hardware and software. Presents information pertaining to basic troubleshooting skills.

Science Communication. Sage Publications, 2455 Teller Rd, Thousand Oaks, CA 91320. scx.sagepub.com, tel: 800-818-7243, fax: 800-583-2665, journals@sagepub.com [8/yr; $168 indiv, $983 inst (print), $903 inst (online), $1003 inst (online+backfile, content through Volume 1, Issue 1/print+online), $1103 inst (print+online+backfile)] An international, interdisciplinary journal examining the nature of expertise and the translation of knowledge into practice and policy.

Social Science Computer Review. Sage Publications, 2455 Teller Rd, Thousand Oaks, CA 91320. ssc.sagepub.com, tel: 800-818-7243, fax: 800-583-2665, journals@sagepub.com [4/yr; $130 indiv, $725 inst (print), $666 inst (online), $740 inst (online+backfile, content through Volume 1, Issue 1/print+online), $814 inst (print+online+backfile)] Interdisciplinary peer-reviewed scholarly publication covering social science research and instructional applications in computing and telecommunications; also covers societal impacts of information technology.

TechTrends. Springer Science+Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/11528, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [6/yr; $132 inst (print/online), $158 inst (print+online, content through 1997)] Targeted at leaders in education and training; features authoritative, practical articles about technology and its integration into the learning environment.

T.H.E. Journal. PO Box 2166, Skokie, IL 60076. http://www.thejournal.com, tel: 866-293-3194, fax: 847-763-9564, thejournal@1105service.com [9/yr; free] For educators of all levels; focuses on a specific topic for each issue, as well as technological innovations as they apply to education.

Information Science and Technology

Canadian Journal of Information and Library Science. University of Toronto Press, Journals Division, 5201 Dufferin St, Toronto, ON, M3H 5T8, Canada. http://www.utpjournals.com/cjils, tel: 416-667-7777, fax: 800-221-9985, journals@utpress.utoronto.ca [4/yr; $50 stud, $85 indiv, $125 inst] Published by the Canadian Association for Information Science to contribute to the advancement of library and information science in Canada.

E-Content. Information Today, Inc., 143 Old Marlton Pike, Medford, NJ 08055-8750. http://www.econtentmag.com, tel: 800-300-9868, fax: 609-654-4309, custserv@infotoday.com [10/yr; free] Features articles on topics of interest to online database users; includes database search aids.

Information Processing & Management. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/infoproman, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [6/yr; $370 indiv, $2157 inst] International journal covering data processing, database building, and retrieval.

Information Services & Use. IOS Press, Nieuwe Hemweg 6B, 1013 BG Amsterdam, The Netherlands. http://www.iospress.nl/html/01675265.php, tel: +31 20 688 3355, fax: +31 20 687 0039, info@iospress.nl [4/yr; $140 indiv (online), $560 inst (online), $616 inst (print+online)] An international journal for those in the information management field. Includes online and offline systems, library automation, micrographics, videotex, and telecommunications.

The Information Society. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/01972243, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [5/yr; $185 indiv, $469 inst (online), $521 inst (print+online)] Provides a forum for discussion of the world of information, including transborder data flow, regulatory issues, and the impact of the information industry.

Information Technology and Libraries. American Library Association, Subscriptions, 50 E Huron St, Chicago, IL 60611-2795. http://www.ala.org/lita/ital, tel: 800-545-2433, fax: 312-944-2641, subscription@ala.org [4/yr; free] Articles on library automation, communication technology, cable systems, computerized information processing, and video technologies.

Information Today. Information Today, Inc., 143 Old Marlton Pike, Medford, NJ 08055-8750. http://www.infotoday.com/it, tel: 609-654-6266, fax: 609-654-4309, custserv@infotoday.com [11/yr; $87.50] Newspaper for users and producers of electronic information services. Includes articles and news about the industry, calendar of events, and product information.

Information Technology Management. IGI Global, 701 E Chocolate Ave, Suite 200, Hershey, PA 17033-1240. http://www.igi-pub.com/journals/details.asp?id=200, tel: 866-342-6657, fax: 717-533-8661, cust@igi-global.com [2/yr; $70 indiv, $90 inst]

Designed for library information specialists, this biannual newsletter presents current issues and trends in information technology presented by and for specialists in the field.

Internet Reference Service Quarterly. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/WIRS, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $85 indiv (online), $90 indiv (print+online), $218 inst (online), $242 inst (print+online)] Discusses multidisciplinary aspects of incorporating the Internet as a tool for reference service.

Journal of Access Services. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/WJAS, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $80 indiv (online), $85 indiv (print+online), $218 inst (online), $242 inst (print+online)] Explores topics and issues surrounding the organization, administration, and development of information technology on access services and resources.

Journal of the American Society for Information Science and Technology. John Wiley & Sons, Inc., Journal Customer Services, 350 Main St, Malden, MA 02148. onlinelibrary.wiley.com/journal/10.1002/(ISSN)1532-2890, tel: 800-835-6770, fax: 781-388-8232, cs-agency@wiley.com [12/yr; $2620 inst (print), $2719 inst (print+online)] Provides an overall forum for new research in information transfer and communication processes, with particular attention paid to the context of recorded knowledge.

Journal of Database Management. IGI Global, 701 E Chocolate Ave, Suite 200, Hershey, PA 17033-1240. http://www.idea-group.com/journals/details.asp?id=198, tel: 866-342-6657, fax: 717-533-8661, cust@igi-global.com [4/yr; $210 indiv, $595 inst (print/online), $860 inst (print+online)] Provides state-of-the-art research to those who design, develop, and administer DBMS-based information systems.

Journal of Documentation. Emerald Group Publishing Inc., Brickyard Office Park, 84 Sherman Street, Cambridge, MA 02140. http://www.emeraldinsight.com/jd.htm, tel: 617-945-9130, fax: 617-945-9136, america@emeraldinsight.com [6/yr; inst prices vary] Focuses on theories, concepts, models, frameworks, and philosophies in the information sciences.

Journal of Interlibrary Loan, Document Delivery & Electronic Reserve. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/1072303X, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [5/yr; $104 indiv (online), $112 indiv (print+online), $412 inst (online), $458 inst (print+online)] A forum for ideas on the basic theoretical and practical problems regarding all aspects of library resource sharing faced by planners, practitioners, and users of network services.

Journal of Library Metadata. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/19386389, tel: 800-354-1420, fax: 215-625-2940, subscriptions@

tandf.co.uk [4/yr; $82 indiv (online), $88 indiv (print + online), $259 inst (online), $288 inst (print + online)] A forum for the latest research, innovations, news, and expert views about all aspects of metadata applications and information retrieval in libraries.

Instructional Design and Development

Human-Computer Interaction. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/07370024, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $84 indiv, $687 inst (online), $763 institution (print + online)] A journal of theoretical, empirical, and methodological issues of user science and of system design.

Instructional Science. Springer Science + Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/11251, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [6/yr; $893 inst (print/online), $1072 inst (print + online, content through 1997)] Promotes a deeper understanding of the nature, theory, and practice of the instructional process and the learning resulting from this process.

International Journal of Human-Computer Interaction. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/10447318, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [12/yr; $194 indiv (online), $206 indiv (print + online), $1601 inst (online), $1779 inst (print + online)] Addresses the cognitive, social, health, and ergonomic aspects of work with computers. It also emphasizes both the human and computer science aspects of the effective design and use of computer interactive systems.

Journal of Educational Technology Systems. Baywood Publishing Co., Inc., 26 Austin Ave, Box 337, Amityville, NY 11701-0337. http://www.baywood.com/journals/previewjournals.asp?id=0047-2395, tel: 800-638-7819, fax: 631-691-1770, info@baywood.com [4/yr; $408 inst (online), $430 inst (print + online)] Deals with systems in which technology and education interface; designed to inform educators who are interested in making optimum use of technology.

Journal of Applied Learning Technology. Learning Technology Institute, 50 Culpeper St, Warrenton, VA 20186. http://www.salt.org/salt.asp?ss=l&pn=jalt, tel: 540-347-0055, fax: 540-349-3169, info@lti.org [4/yr; $100 member, $45 non-member, $40 inst] Devoted to the issues, problems, and applications of instructional delivery systems in education, training, and job performance.

Journal of Technical Writing and Communication. Baywood Publishing Co., Inc., 26 Austin Ave, Box 337, Amityville, NY 11701-0337. http://www.baywood.com/

journals/previewjournals.asp?id=0047-2816, tel: 800-638-7819, fax: 631-691-1770, info@baywood.com [4/yr; $109 indiv (online), $117 indiv (print+online), $408 inst (online), $430 inst (print+online)] Essays on oral and written communication, for purposes ranging from pure research to needs of business and industry.

Journal of Visual Literacy. International Visual Literacy Association, Dr. David R. Moore, IVLA Executive Treasurer, Ohio University, 250 McCracken Hall, Athens, OH 45701. http://www.ohio.edu/visualliteracy, tel: 740-597-1322, jvleditor@ohio.edu [2/yr; $30 student, $60 indiv] Explores empirical, theoretical, practical, and applied aspects of visual literacy and communication.

Performance Improvement. John Wiley & Sons, Inc., Journal Customer Services, 350 Main St, Malden, MA 02148. http://www3.interscience.wiley.com/journal/112729556/home, tel: 800-835-6770, fax: 781-388-8232, cs-agency@wiley.com [10/yr; $85 indiv (print/online), $94 indiv (print+online), $376 inst (print/online), $434 inst (print+online)] Promotes performance science and technology. Contains articles, research, and case studies relating to improving human performance.

Performance Improvement Quarterly. John Wiley & Sons, Inc., Journal Customer Services, 350 Main St, Malden, MA 02148. http://www3.interscience.wiley.com/journal/117865970/home, tel: 800-835-6770, fax: 781-388-8232, cs-agency@wiley.com [4/yr; $65 indiv, $195 inst (print/online/print+online)] Presents the cutting edge in research and theory in performance technology.

Training. Lakewood Media Group, PO Box 247, Excelsior, MN 55331. http://www.trainingmag.com, tel: 877-865-9361, fax: 847-291-4816, ntrn@omeda.com [6/yr; $79, free to qualified applicants] Covers all aspects of training, management, and organizational development, motivation, and performance improvement.

Learning Sciences

International Journal of Computer-Supported Collaborative Learning. Springer Science+Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/11412, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [4/yr; $466 inst (print/online), $559 inst (print+online, content through 1997)] Promote a deeper understanding of the nature, theory, and practice of the uses of computer-supported collaborative learning.

Journal of the Learning Sciences. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/10508406, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $78 indiv, $756 inst (online), $840 inst (print+online)] Provides a forum for the discussion of research on education and learning, with emphasis on the idea of changing one's understanding of learning and the practice of education.

Libraries and Media Centers

Collection Building. Emerald Group Publishing Inc., Brickyard Office Park, 84 Sherman Street, Cambridge, MA 02140. http://www.emeraldinsight.com/cb.htm, tel: 617-945-9130, fax: 617-945-9136, america@emeraldinsight.com [4/yr; inst prices vary] Provides well-researched and authoritative information on collection maintenance and development for librarians in all sectors.

Computers in Libraries. Information Today, Inc., 143 Old Marlton Pike, Medford, NJ 08055-8750. http://www.infotoday.com/cilmag/default.shtml, tel: 609-654-6266, fax: 609-654-4309, custserv@infotoday.com [10/yr; $99.95] Covers practical applications of microcomputers to library situations and recent news items.

The Electronic Library. Emerald Group Publishing Inc., Brickyard Office Park, 84 Sherman Street, Cambridge, MA 02140. info.emeraldinsight.com/el.htm, tel: 617-945-9130, fax: 617-945-9136, america@emeraldinsight.com [6/yr; inst prices vary] International journal for minicomputer, microcomputer, and software applications in libraries; independently assesses current and forthcoming information technologies.

Government Information Quarterly. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/govinf, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [4/yr; $195 indiv, $680 inst] International journal of resources, services, policies, and practices.

Information Outlook. Special Libraries Association, Information Outlook Subscriptions, 1700 Eighteenth Street, NW, Washington, DC 20009-2514. http://www.sla.org/pubs/serial/io, tel: 703-647-4900, fax: 1-202-234-2442, magazine@sla.org [12/yr; $125] Discusses administration, organization, and operations. Includes reports on research, technology, and professional standards.

The Journal of Academic Librarianship. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/jacalib, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [6/yr; $140 indiv, $413 inst] Results of significant research, issues, and problems facing academic libraries, book reviews, and innovations in academic libraries.

Journal of Librarianship and Information Science. Sage Publications, 2455 Teller Rd, Thousand Oaks, CA 91320. lis.sagepub.com, tel: 800-818-7243, fax: 800-583-2665, journals@sagepub.com [4/yr; $107 indiv, $733 inst (print), $673 inst (online), $748 inst (online + backfile, content through Volume 1, Issue 1/print + online), $823 inst (print + online + backfile)] Deals with all aspects of library and information work in the United Kingdom and reviews literature from international sources.

Journal of Library Administration. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/01930826, tel: 800-354-1420, fax: 215-625-2940, subscriptions@

tandf.co.uk [8/yr; $211 indiv (online), $234 indiv (print+online), $809 inst (online), $899 inst (print+online)] Provides information on all aspects of effective library management, with emphasis on practical applications.

Library & Information Science Research. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/lisres, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [4/yr; $165 indiv, $520 inst] Research articles, dissertation reviews, and book reviews on issues concerning information resources management.

Library Hi Tech. Emerald Group Publishing Inc., Brickyard Office Park, 84 Sherman Street, Cambridge, MA 02140. http://www.emeraldinsight.com/lht.htm, tel: 617-945-9130, fax: 617-945-9136, america@emeraldinsight.com [4/yr; inst prices vary] Concentrates on reporting on the selection, installation, maintenance, and integration of systems and hardware.

Library Hi Tech News. Emerald Group Publishing Inc., Brickyard Office Park, 84 Sherman Street, Cambridge, MA 02140. http://www.emeraldinsight.com/lhtn.htm, tel: 617-945-9130, fax: 617-945-9136, america@emeraldinsight.com [10/yr; inst prices vary] Supplements Library Hi Tech and updates many of the issues addressed in-depth in the journal; keeps the reader fully informed of the latest developments in library automation, new products, network news, new software and hardware, and people in technology.

Library Journal. Media Source, Inc., 160 Varick Street, 11th Floor, New York, NY 10013. http://www.libraryjournal.com, tel: 800-588-1030, fax: 712-733-8019, LJLcustserv@cds-global.com [23/yr; $157.99] A professional periodical for librarians, with current issues and news, professional reading, a lengthy book review section, and classified advertisements.

Library Media Connection. Linworth Publishing, Inc., PO Box 204, Vandalia, Ohio 45377. http://www.librarymediaconnection.com/lmc, tel: 800-607-4410, fax: 937-890-0221, linworth@linworthpublishing.com [6/yr; $69] Journal for junior and senior high-school librarians; provides articles, tips, and ideas for day-to-day school library management, as well as reviews of audiovisuals and software, all written by school librarians.

The Library Quarterly. University of Chicago Press, Journals Division, PO Box 37005, Chicago, IL 60637. http://www.journals.uchicago.edu/LQ, tel: 877-705-1878, fax: 877-705-1879, subscriptions@press.uchicago.edu [$26 students (online), $47 indiv (print), $46 indiv (online), $52 indiv (print+online), inst prices vary] Scholarly articles of interest to librarians.

Library Resources & Technical Services. American Library Association, Subscriptions, 50 E Huron St, Chicago, IL 60611-2795. http://www.ala.org/ala/mgrps/divs/alcts/resources/lrts/index.cfm, tel: 800-545-2433, fax: 312-944-2641, subscription@ala.org [4/yr; $100 print, $95 online, $105 print+online] Scholarly papers on bibliographic access and control, preservation, conservation, and reproduction of library materials.

Library Trends. Johns Hopkins University Press, PO Box 19966, Baltimore, MD 21211-0966. http://www.press.jhu.edu/journals/library_trends, tel: 800-548-1784, fax: 410-516-3866, jrnlcirc@press.jhu.edu [4/yr; $80 indiv (print), $85 indiv (online), $150 inst (print)] Each issue is concerned with one aspect of library and information science, analyzing current thought and practice and examining ideas that hold the greatest potential for the field.

Public Libraries. American Library Association, Subscriptions, 50 E Huron St, Chicago, IL 60611-2795. http://www.ala.org/pla/publications/publiclibraries, tel: 800-545-2433, fax: 312-944-2641, subscription@ala.org [6/yr; $65] News and articles of interest to public librarians.

Public Library Quarterly. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/WPLQ, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $114 indiv (online), $123 indiv (print+online), $373 inst (online), $415 inst (print+online)] Addresses the major administrative challenges and opportunities that face the nation's public libraries.

Reference and User Services Quarterly. American Library Association, Subscriptions, 50 E Huron St, Chicago, IL 60611-2795. rusq.org, tel: 800-545-2433, fax: 312-944-2641, subscription@ala.org [4/yr; $33 student, $65 member] Disseminates information of interest to reference librarians, bibliographers, adult services librarians, those in collection development and selection, and others interested in public services.

The Reference Librarian. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/wref, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $251 indiv (online), $278 indiv (print+online), $1057 inst (online), $1174 inst (print+online)] Each issue focuses on a topic of current concern, interest, or practical value to reference librarians.

Reference Services Review. Emerald Group Publishing Inc., Brickyard Office Park, 84 Sherman Street, Cambridge, MA 02140. http://www.emeraldinsight.com/rsr.htm, tel: 617-945-9130, fax: 617-945-9136, america@emeraldinsight.com [4/yr; inst prices vary] Dedicated to the enrichment of reference knowledge and the advancement of reference services. It prepares its readers to understand and embrace current and emerging technologies affecting reference functions and information needs of library users.

School Library Journal. Media Source, Inc., 160 Varick Street, 11th Floor, New York, NY 10013. http://www.slj.com, tel: 800-595-1066, fax: 712-733-8019, sljcustserv@cds-global.com [15/yr; $136.99] For school and youth service librarians. Reviews about 4,000 children's books and 1,000 educational media titles annually.

School Library Media Activities Monthly. Libraries Unlimited, Inc., PO Box 291846, Kettering OH 45429. http://www.schoollibrarymedia.com, tel: 800-771-5579, fax: 937-890-0221, schoollibrarymonthly@sfsdayton.com [8/yr; $55]

A vehicle for distributing ideas for teaching library media skills and for the development and implementation of library media skills programs.

School Library Media Research. American Library Association and American Association of School Librarians, Subscriptions, 50 E Huron St, Chicago, IL 60611-2795. http://www.ala.org/ala/aasl/aaslpubsandjournals/slmrb/schoollibrary.cfm, tel: 800-545-2433, fax: 312-944-2641, subscription@ala.org [annual compilation; free online] For library media specialists, district supervisors, and others concerned with the selection and purchase of print and nonprint media and with the development of programs and services for preschool through high-school libraries.

Teacher Librarian. The Scarecrow Press, Inc., 4501 Forbes Blvd, Suite 200, Lanham, MD 20706. http://www.teacherlibrarian.com, tel: 800-462-6420, fax: 800-338-4550, admin@teacherlibrarian.com [5/yr; $56 indiv] "The journal for school library professionals"; previously known as Emergency Librarian. Articles, review columns, and critical analyses of management and programming issues.

Media Technologies

Broadcasting & Cable. NewBay Media, LLC., 28 E. 28th St. 12th Floor, New York, NY 10016. http://www.broadcastingcable.com, tel: 800-554-5729, fax: 712-733-8019, bcbcustserv@cdsfulfillment.com [47/yr; $199] All-inclusive newsweekly for radio, television, cable, and allied business.

Educational Media International. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/09523987, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $145 indiv, $530 inst (online), $590 inst (print + online)] The official journal of the International Council for Educational Media.

Historical Journal of Film, Radio and Television. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/01439685, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $434 indiv, $1187 inst (online), $1319 inst (print + online)] Articles by international experts in the field, news and notices, and book reviews concerning the impact of mass communications on political and social history of the 20th century.

International Journal of Instructional Media. Westwood Press, Inc., 118 5 Mile River Rd, Darien, CT 06820-6237. http://www.adprima.com/ijim.htm, tel: 203-656-8680, fax: 212-353-8291, PLSleeman@aol.com [4/yr; $225] Focuses on quality research on ongoing programs in instructional media for education, distance learning, computer technology, instructional media and technology, telecommunications, interactive video, management, media research and evaluation, and utilization.

Journal of Educational Multimedia and Hypermedia. Association for the Advancement of Computing in Education, PO Box 1545, Chesapeake, VA 23327-1545. http://www.aace.org/pubs/jemh, tel: 757-366-5606, fax: 703-997-8760, info@aace.org [4/yr; $45 for stud, $125 indiv, $195 inst] A multidisciplinary information source presenting research about and applications for multimedia and hypermedia tools.

Journal of Popular Film and Television. Taylor & Francis Group, Customer Service Dept, 325 Chestnut Street, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/01956051.asp, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $66 indiv, $177 inst (online), $197 (print+online)] Articles on film and television, book reviews, and theory. Dedicated to popular film and television in the broadest sense. Concentrates on commercial cinema and television, film and television theory or criticism, filmographies, and bibliographies. Edited at the College of Arts and Sciences of Northern Michigan University and the Department of Popular Culture, Bowling Green State University.

Learning, *Media & Technology*. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/17439884, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $475 indiv, $1657 inst (online), $1841 inst (print+online)] This journal of the Educational Television Association serves as an international forum for discussions and reports on developments in the field of television and related media in teaching, learning, and training.

Media & Methods. American Society of Educators, 1429 Walnut St, Philadelphia, PA 19102. http://www.media-methods.com, tel: 215-563-6005, fax: 215-587-9706, info@media-methods.com [5/yr; $35] The only magazine published for the elementary school library media and technology specialist. A forum for K-12 educators who use technology as an educational resource, this journal includes information on what works and what does not, new product reviews, tips and pointers, and emerging technologies.

Multichannel News. NewBay Media, LLC., 28 E. 28th St. 12th Floor, New York, NY 10016. http://www.multichannel.com, tel: 888-343-5563, fax: 712-733-8019, mulcustserv@cdsfulfillment.com [47/yr; $199] A newsmagazine for the cable television industry. Covers programming, marketing, advertising, business, and other topics.

MultiMedia & Internet@Schools. Information Today, Inc., 143 Old Marlton Pike, Medford, NJ 08055-8750. http://www.mmischools.com, tel: 609-654-6266, fax: 609-654-4309, custserv@infotoday.com [5/yr; $19.95] Reviews and evaluates hardware and software. Presents information pertaining to basic troubleshooting skills

Multimedia Systems. Springer Science+Business Media, PO Box 2485, Secaucus, NJ 07096-2485. http://www.springer.com/journal/00530, tel: 800-777-4643, fax: 201-348-4505, service-ny@springer.com [6/yr; $676 inst (print/online), $811 inst (print + online, content through 1997)] Publishes original research articles and serves as a forum for stimulating and disseminating innovative research ideas, emerging technologies, state-of-the-art methods, and tools in all aspects of multimedia computing, communication, storage, and applications among researchers, engineers, and practitioners.

Telematics and Informatics. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/tele, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [4/yr; $153 indiv, $1365 inst] Publishes research and review articles in applied telecommunications and information sciences in business, industry, government, and educational establishments. Focuses on important current technologies, including microelectronics, computer graphics, speech synthesis and voice recognition, database management, data encryption, satellite television, artificial intelligence, and the ongoing computer revolution.

Professional Development

Journal of Digital Learning in Teacher Education. International Society for Technology in Education, Special Interest Group for Teacher Educators, 180 West 8th Ave., Suite 300, Eugene, OR 97401. http://www.iste.org/jdlte, tel: 800-336-5191, fax: 541-302-3778, iste@iste.org [4/yr; $32 member, $122 non-member] Contains refereed articles on preservice and inservice training, research in computer education and certification issues, and reviews of training materials and texts.

Journal of Technology and Teacher Education. Association for the Advancement of Computing in Education, PO Box 1545, Chesapeake, VA 23327-1545. http://www.aace.org/pubs/jtate, tel: 757-366-5606, fax: 703-997-8760, info@aace.org [4/yr; $45 for stud, $125 indiv, $195 inst] Serves as an international forum to report research and applications of technology in preservice, inservice, and graduate teacher education.

Simulation, Gaming, and Virtual Reality

Simulation & Gaming. Sage Publications, 2455 Teller Rd, Thousand Oaks, CA 91320. sag.sagepub.com, tel: 800-818-7243, fax: 800-583-2665, journals@sagepub.com [6/yr; $147 indiv, $1047 inst (online), $1152 inst (online + backfile, content through Volume 1, Issue 1)] An international journal of theory, design, and research focusing on issues in simulation, gaming, modeling, role-playing, and experiential learning.

Special Education and Disabilities

Journal of Special Education Technology. Technology and Media Division, JSET, P.O. Box 3853, Reston, VA 20195. http://www.tamcec.org/jset, tel: 703-709-0136, fax: 405-325-7661, info@exinn.net [4/yr; $87 indiv, $208 inst] Provides information, research, and reports of innovative practices regarding the application of educational technology toward the education of exceptional children.

Telecommunications and Networking

Canadian Journal of Learning and Technology. Canadian Network for Innovation in Education (CNIE), 260 Dalhousie St., Suite 204, Ottawa, ON, K1N 7E4, Canada. http://www.cjlt.ca, tel: 613-241-0018, fax: 613-241-0019, cjlt@ucalgary.ca [3/yr; free] Concerned with all aspects of educational systems and technology.

Computer Communications. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/comcom, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [18/yr; $2319 inst (print/online)] Focuses on networking and distributed computing techniques, communications hardware and software, and standardization.

EDUCAUSE Review. EDUCAUSE, 4772 Walnut St, Suite 206, Boulder, CO 80301-2536. http://www.educause.edu/er, tel: 303-449-4430, fax: 303-440-0461, er-subs@educause.edu [6/yr; $35] Features articles on current issues and applications of computing and communications technology in higher education. Reports on EDUCAUSE consortium activities.

International Journal on E-Learning. Association for the Advancement of Computing in Education, PO Box 1545, Chesapeake, VA 23327-1545. http://www.aace.org/pubs/ijel, tel: 757-366-5606, fax: 703-997-8760, info@aace.org [4/yr; $45 for stud, $125 indiv, $195 inst] Reports on current theory, research, development, and practice of telecommunications in education at all levels.

The Internet and Higher Education. Elsevier, Inc., Journals Customer Service, 3251 Riverport Lane, Maryland Heights, MO 63043. http://www.elsevier.com/locate/iheduc, tel: 877-839-7126, fax: 314-447-8077, journalcustomerservice-usa@elsevier.com [4/yr; $80 indiv, $450 inst] Designed to reach faculty, staff, and administrators responsible for enhancing instructional practices and productivity via the use of information technology and the Internet in their institutions.

Internet Reference Services Quarterly. Taylor & Francis Group, Customer Services Dept, 325 Chestnut St, Suite 800, Philadelphia, PA 19106. http://www.tandf.co.uk/journals/titles/10875301, tel: 800-354-1420, fax: 215-625-2940, subscriptions@tandf.co.uk [4/yr; $85 indiv (online), $90 indiv (print+online), $218 inst (online), $242 inst (print+online)] Describes innovative information practice, technologies, and practice. For librarians of all kinds.

Internet Research. Emerald Group Publishing Inc., Brickyard Office Park, 84 Sherman Street, Cambridge, MA 02140. http://www.emeraldinsight.com/intr.htm, tel: 617-945-9130, fax: 617-945-9136, america@emeraldinsight.com [5/yr; inst prices vary] A cross-disciplinary journal presenting research findings related to electronic networks, analyses of policy issues related to networking, and descriptions of current and potential applications of electronic networking for communication, computation, and provision of information services.

Online. Information Today, Inc., 143 Old Marlton Pike, Medford, NJ 08055-8750. http://www.infotoday.com/online, tel: 609-654-6266, fax: 609-654-4309, custserv@infotoday.com [6/yr; $129.50] For online information system users. Articles cover a variety of online applications for general and business use.

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