Teaching and Learning in Higher Education

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> The Master said:
> *"To be fond of something is better than merely to know it,*
> *and to find joy in it is better than to be fond of it".*
> Confucius

1. Impact of Globalization on the Character of Universities

In the context of the "new political economy" of Higher Education, "good teaching" is recognized as a very important academic function, while the amateurism in teaching is no longer tolerated. Thus, the establishment of special centers for teaching and staff developing, for promoting research on the so-called "University Teaching", and for establishing friendly teaching and learning environments was financed in many universities. The massification of higher education, the growing diversity of student population, and the competition between institutions puts pressure in the same direction (Biggs & Tange, 2007:2-3).

Given the importance of education in the lives of individuals and the progress of societies, university teachers' response to new requirements is often presented as a dilemma: university teaching will either continue to follow the traditional, largely ineffective, ways, or will try innovative practices to improve the quality of teaching and learning (Fink, 2003:1-3). However, the changes of instructional paradigm are often limited in shaping styles and techniques that are not capable of effective university teaching (Clark, 1995; Collis, 1998; Friesen & Kristjanson, 2007). In this light, it is estimated that the most common form of teaching, the lecture, especially in large audiences, has limited potential to help students, as it is illustrated in the following comparative table (Biggs & Tange, 2007:2; Fink, 2003:16-22):

Traditional vs. New Instructional Paradigm

Field	Traditional Instructional Paradigm	New Instructional Paradigm

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Aim	Improving the quality of teaching	Improving the quality of learning
Criteria	Quality of imported students	Quality of graduates
Instructional Structures	Adequate coverage of material	Specific learning outcomes
Learning Theory	Linear – commutative perception of learning	Learning as a result of interaction frames
Teacher's Role	Design of courses and delivery of training	Design of strategies and of learning environments

As learning experiences important for students are now identified those which are concerned with both the processes and the products of learning. Criteria for the first are the high degree of motivation of the audience during the teaching and active participation in learning, while for the latter the value for the personal lives of students, for their work, for their involvement in the community, etc., as well as the achievement of remarkable changes in their attitudes and in modes of thinking (Fink, 2003:6-7 & 31-33). Indeed, many universities are showing more interest to centers or institutes not on the design of instruction but on the results of learning, that their students gain significant learning experiences (Barr & Tagg, 1995).

Of course, changes in this direction are provided with a general change in the culture of university and, naturally, changes in attitudes and practices of the staff. It is argued that a modern university must tend to create "communities of learning, dialogue, research, and practice" (Pardales & Girod, 2006; Ponger, 2005), such as the community set up by Richard Paul in California (The Center of Critical Thinking, available at: http://www.criticalthinking.org) or by James Bell in Maryland (Howard Community College: Improving Student Learning and College Teaching, available at: http://www.howardcc.edu).

In this context, the following basic principles are recommended (Clark, 1995; Eisenkraft, 2003; Friesen & Kristjanson, 2007):

1) The selection of appropriate content and topics, to be able to encourage independent critical thinking, to expand the knowledge of students, and to help them cultivate skills relevant to the teaching subject.
2) The good preparation and organization of courses (aims, themes, charts, extensions, connections to other subjects, summaries, etc.).
3) The clear explanations of concepts and of principles with concrete examples and with emphasis on difficult points.
4) The appropriate use of speech and of intonation, as well as of signs of non-verbal communication.
5) The demonstration of enthusiasm for teaching and the development of topics that can stimulate students' interest (e.g. practical applications).
6) The encouragement of class participation (e.g. provision of time for questions and comments, positive reinforcement, formulating provocative questions).
7) The demonstration of interest and sympathy in and out of the classroom (e.g. discussion of students' ideas, questions or hobbies, tolerance to errors).
8) The provision for fair and frequent communication (e.g. feedback with constructive comments, brief correction of written essays, clarity of assessment, etc.).

2. Key Issues: Transformative and Creative Learning

Transformative Learning has its origins in the positions of John Dewey to link education with democracy and the moral dimension of individuals and societies (Dewey, 1916). But, for this to be achieved, it is necessary to have students prepared to develop high-level critical thinking skills, to capture the ability for multiple views and interpretations, to be open to the different, to actively participate in pluralistic democracy, and to have social, moral and ecological sensitivities (Nagda et. al., 2003). Thus, students will be able based on organizational structures (building blocks) of their experiences o implement a dynamic model of transfer of learning (Rebello & Zollman, 2005). This model constitutes a meaningful act if it requires not only the motivation of cognitive system of the learners to cope with new tasks in new situations, but also active and conscious engagement in reflective learning (Mezirow, 1991; Perkins & Salomon, 1992). Through critical consciousness, therefore, learning can become "transformative" and, through dialogue with others, be translated into practice of self-awareness and of personal development and empowerment (Merrian & Heuer, 1995).

Towards this direction, it is suggested that strategies and techniques such as the following can be effective (James, 2006; Nagda et al., 2003):

- Creation of learning expectations
- Consistency of information or data
- Simulation
- Role playing
- Modeling
- Problem-based learning
- Parallel problem solving
- Application of theoretical knowledge into practice
- Conceptual generalization
- Use of ratios and metaphors
- Metacognitive reflection
- Structured dialogue in small groups.

So, the highest level of learning is the "transformative learning", which, however, to be such must meet the following conditions (Deakin Crick, 2005):

- Self-awareness
- Application of acquired knowledge in order to create new meanings
- Capacity development of critical vigilance
- Cultivation of creativity
- Developing of interactive learning relationships
- Changing strategic perceptions of knowledge and of the world
- Strengthening a sense of interdependence and social solidarity.

Creativity, in turn, is a complex construct and it is most commonly expressed through a broad range of intelligences including linguistic, musical, mathematical, spatial, kinesthetic, interpersonal, and perhaps even intrapersonal. Torrance (1962) defined creativity as "the process of sensing gaps or disturbing, missing elements; forming ideas or hypotheses concerning them; testing these hypotheses; and communicating the results, possibly modifying and retesting the hypotheses". Dass (2004) pointed out that these components of creativity are the usual features of a scientific activity. To promote creativity in university classrooms, he cited the following strategies (cf. Donnelly, 2004; Ramirez & Ganaden, 2008):

- Divergent thinking

- Open-ended questioning
- Consideration of alternative viewpoints
- Generation of unusual ideas and metaphors
- Novelty
- Solving problems and puzzles
- Designing devices and machines
- Multiple modes of communicating results
- Visualization.

So, key questions in university teaching should be the following (Biggs & Tange, 2007:17-19):

1) Which of the three main theories used to teach at the university?
   a) What are students? In this case, the teacher informs, while the student assimilates.
   b) What do teachers? In this case, the teacher explains scientific concepts, principles, etc.
   c) What do students? In this case, the focus is on active learning activities.
2) What is learning theory behind the teaching?
   a) Behaviorism: accumulation of information, reproduction of ready-made knowledge, near transfer of knowledge.
   b) Phenomenography: focus on ways in which students create meanings, far transfer of knowledge.
   c) Constructivism: focus on the nature of learning activities, far transfer of knowledge.

The latter two agree with each other in that learning is not formalistic knowledge transfer but changing the way we perceive ourselves and the world.

3. Teaching in Large Audiences: An Effective Model

Often, a very superficial approach to learning is encouraged, i.e. memorizing isolated facts, key-words, definitions, taxonomic lists, etc., without any real understanding of the subject or of the topic. In contrast, the in-depth approach emphasizes on (ibid:24-25):

- Understanding the structure of the subject
- Previous experience of students (pre-existing knowledge)
- Dealing with misunderstandings
- Creating a positive learning climate
- Active learning
- Developing motivation
- Learning strategies to learn.

In the whole learning process, apart from learning new techniques, the incentive learning and positive expectations must also hold an important place, both at the beginning and during the courses, as well as the reflective teaching. In this way, students will be able not only to give personal meaning to knowledge, but also to understand what they need to change and why (ibid:31-44). Important is the design of learning experiences aiming to (ibid:64-80):

- Cultivating positive attitudes for academic learning (academic knowledge and research), for citizenship (social responsibility), and for lifelong learning (meet new problems and situations)

- Developing skills for searching and processing information, for research, for personal intellectual autonomy, for socio-professional ethics, and for successful communication
- Coupling of academic knowledge (declarative, procedural, and conceptual) with professional (functional, specific, and realistic) and conquering different levels of understanding, from pre-structural and one-dimensional up to correlative and abstract.

Thus, in the context of a teaching methodology that aims to create significant learning experiences, teaching in large audiences (lecture or tutorial) can be effective if teacher acts not merely as ordinary transponder of information in specified conditions, but as mediator for transformative learning, helping students to build their own scientific knowledge, focusing on what they are doing in the classroom. A large audience can be interactive, if teacher (ibid:104-131 & 138-151):

- Properly prepares their lessons (introduction, objectives, questions, activities, reflection, feedback)
- Exerts their students how to take notes based on concept maps
- Uses alternative activities that facilitate the coupling of theoretical and applied knowledge (e.g. group teaching, focus on case studies, problem solving, correlation with workplace, etc.), utilizes in parallel and the opportunities offered by modern educational technology (Anderson et al., 2001; Naidu, 2001).

Thus, the dichotomy between the *lecture*, on the one hand, as a means of passive transmission predetermined scientific knowledge and manipulation of the students, and the *dialogue*, on the other hand, as a means for enlightenment and giving new meanings to knowledge can be lifted (Brookfield & Preskill, 1999:35-36). In this light, the above dichotomy can be seen as non-pedagogical, because things can happen vice versa too (Shor & Freire, 1987:40).

To make teaching in large audiences more systematic you, as university teacher, can apply the recommendations below (Brookfield & Preskill, 1999:34-38; Shor, 1992:32-33):

1) Before courses, provide students with texts for an initial reading (critical pre-reading), accompanied by epistemological questions of empirical, communicative and socio-political content, or by problems of apropos or academic character.

2) Begin with one or more key-questions (framing questions) or with the position and discuss topical, generic or academic problems. In this way it is indicated that education is an ongoing research process through which one tries to capture a deeper understanding, as well as that scientific truth may be temporary. If you use in each course such a strategy, then students will be more receptive to exploring structural questions or to identifying and analyzing problems.

3) Introduce carefully alternative optical (alternative perspectives) relating to the subjects taught. The way the disposition to take different perspectives seriously into account without the accurance of defensive reflexes can be cultivated. One way for the instructor to achieve this is to present himself/herself all the arguments against the claims. Another is to give the floor to one or more students with the opposing views or even a doubt.

4) Distribute periods for determining and controlling fundamental assumptions / cases (periods of assumptions hunting). The examination of fundamental assumptions must be conduced in front of the students in a

way which would be build on methodology of "thinking aloud" (Ericsson & Simon, 1993).

5) Use the "lively" working in groups (buzz groups), so that students can converse with each other. These groups should be composed of three to four students and be activated two or three times during the course. Group working should be based on concrete questions about the significance and the relation to the subjects taught or about the clarity and usefulness of views held during the course, as well as on estimations for the stability of the arguments presented.

6) Enter periods of "silent contemplation" (periods of reflective silence). The lecture could be interrupted every twenty minutes in order to provide students with time to reflect on what they heard. Then, individual students or small groups can be requested to present their ideas and comments orally or in writing (Catterall, 2005).

7) Finish with a series of questions that the lecture brought to light or left unanswered.

Finally, upon completion of each course session it is appropriate to give students an online eponymous questionnaire (critical incident questionnaire) for critical review of "episodes" of teaching, which will always include the same questions (Brookfield & Preskill, 1999:38-40; Reeves, 2006):

1) Was it a pleasant course session?
2) Will what you have learned affect your effectiveness in the future?
3) Where do you think that you could apply what you have learned?
4) Which point of course did you participate more actively at?
5) Which point of course did you participate less at?
6) Which classroom activity do you think you benefited the most from?
7) Which activity do you appreciate that caused you embarrassment or confusion?
8) What did surprise you the most in this course?
9) Which of your questions remained unanswered?

Students will complete this online questionnaire after every course session and return it to the teacher, who should answer, in case he/she finds it necessary. The entire process is extremely useful for the feedback of the teacher and of the students, as well as a tool for students to make and receive criticism.

4. Instructional Strategies in Specialized Courses (Labs, Workshops, etc.)
4.1. Problem-based Learning

Problem-based Learning (PBL) was pioneered in the medical school program at McMaster University in Hamilton, Ontario, Canada in the late 1960s by Howard Barrows and his colleagues. The *Problem-based Learning* curriculum was developed in order to (Savery, 2006):

- Stimulate the learners
- Assist the learners in seeing the relevance of learning to future roles
- Maintain a higher level of motivation towards learning
- Show the learners the importance of responsible, professional attitudes.

Problem-based Learning is a student-centered pedagogy in which students learn about a subject in the context of complex, multifaceted, and realistic problems (not to be confused with project-based learning). The goals of *Problem-based Learning* are to help the students develop flexible knowledge, effective problem solving skills, self-directed learning, effective collaboration skills and intrinsic

motivation. Working in groups, students identify what they already know, what they need to know, and how and where to access new information that may lead to resolution of the problem. The role of the instructor is that of facilitating learning, providing appropriate scaffolding, supporting and modelling the process, and monitoring the learning. The tutor must build students' confidence to take on the problem, encourage the student, while also stretching their understanding (Douvlou, 2006).

4.2. Project-based Learning

While *Problem-based Learning* and *Project-based Learning* share much in common, they are two distinct approaches to learning. In *Problem-based Learning*, a specific problem is specified by the course instructor. Students work individually or in teams over a period of time to develop solutions to this problem. In *Project-based Learning*, students have a great deal of control of the project they will work on and what they will do in the project. The project may or may not address a specific problem. This instructional approach is widely used in Architecture Education, Business Education, Medical Education, and in other situations where "case study" methods provide a useful focus in teaching/learning (Thomas, 1998).

Project-based Learning is a dynamic approach to teaching in which students explore real-world problems and challenges. With this type of authentic, active and engaged learning, students are inspired to obtain a deeper knowledge of the subjects they are studying. *Project-based Learning* is an instructional method that provides students with complex tasks based on challenging questions or problems that involve the students' problem solving, decision making, investigative skills, and reflection that includes teacher facilitation, but not direction (Patton, 2012:13 & 24-27).

This type of learning is focused on questions that drive students to encounter the central concepts and principles of a subject hands-on. Students conduct research using a variety of sources, from the Internet to interviews with experts. They work on the project over an extended period of time because of the in-depth nature of the investigation. Like professionals trying to solve a problem, they don't restrict themselves to one discipline but delve into whatever is appropriate to the study. They form their own investigation of a guiding question, which allows them to develop valuable research skills as they engage in design, problem solving, decision making, and investigative activities. Through *Project-based Learning*, students learn from these experiences and take them into account and apply them to the world outside their classroom. Finally, *Project-based Learning* is a different teaching strategy that promotes and practices new learning habits, emphasizing creative thinking skills by allowing students to find that there are many ways to solve a problem (Blumenfeld et al., 1991).

5. Architectural Education and Studio-based Learning

Young people go to University with the aim of becoming architects; of finding out if they have got what it takes. But, what is the first thing you should teach them?

First of all, you must explain that the person standing in front of them is not someone who asks questions whose answers he already knows. Practicing architecture is asking oneself questions, finding one's own answers with the help of the teacher, whittling down, and finding solutions. Over and over again.

The strength of a good design lies in us and in our ability to perceive the world with both emotion and reason. A good architectural design is sensuous. A good architectural design is intelligent. We all experience architecture before we have even heard the word. The roots of architectural understanding lie in our architectural

experience: our room, our house, our street, our village, our town, our landscape –we experience them all early on, unconsciously, and we compare them with the countryside, towns and houses that we experience later on–. The roots of our understanding of architecture lie in our childhood, in our youth; they lie in our biography. Students have to learn to work consciously with their personal biographical experiences of architecture. Their allotted tasks are devised to set this process in motion. A very useful task could be the design or the redesign of a school building (Zumthor, 2006:57-59).

Studio is at is the very heart of the educational experience for design oriented disciplines where studio courses/ subjects/ projects are significant components of a majority of the semesters in a student's career. For studio-teaching can be used various strategies –if certainly teachers are not restricted to the traditional role of master.

Among these strategies in recent years the emphasis is on *Problem-based Learning* or on *Project-based Learning*. *Studio-based Learning* or *Studio Teaching Project (STP)* is a synthesis of the previous two strategies, mainly Project-based learning, along with strategies and activities designed to develop high order critical and creative thinking skills.

There are several architectural schools around the world, which implement innovative teaching strategies, conduct research projects, have special publications, and carry out specific meetings or fora. For example:

a) The Centre for Education in the Built Environment (CEBE) – Cardiff University.
b) The Studio-Teaching Project (STP) –a collaboration among the University of New South Wales, University of Queensland, RMIT University and University of Tasmania, under the supervision of the Australian Learning and Teaching Council.

A synthesis of findings from across the *Studio Teaching Project* (literature review, National Forums, Academic Survey, Heads of School Survey) led to a series of interdependent benchmark statements about effective practice in studio that can be used by studio teachers to reflect on their practice, and by those involved in curriculum design, development and review. These benchmarks are (Zehner et. al., 2010):

- Quality projects
- Quality staff
- Positive studio community
- Students' engagement and commitment
- High level of interaction
- Effective collaboration amongst students
- Reasonable class and group sizes
- Connection with industry and the profession
- A variety of studio outcomes; and provision of appropriate studio spaces and facilities.

As Zehner et al. pointed out (ibid), "benchmarks 'in practice' are likely to be even more useful to those developing studio-based curricula, and to that end the *Studio Teaching Project* compiled an extensive range of examples of how Australian academics have approached and implemented a variety of effective studios. One of the overall conclusions of the *Studio Teaching Project* has been that high quality studio experiences are never simply determined by any one of the key variables or benchmarks. The spirit of studio teaching is the creation of an open-ended space of

exploration in which students and staff work collaboratively. The importance of the 'project' in a quality studio points us to what is really significant in all studios: challenge, inspiration, multidisciplinarity, relevance, the taking of risks, and the unpredictability".

6.   The Most Important Elements in University Teaching
6.1. The Critical Dialogue

The *Critical Dialogue* or *Critical Discussion* in the class could be a means by which teachers can act as true intellectuals (= transformative intellectuals) to transform the ideas and the attitudes of their students, assuming of course that they will focus on open and challenging questions, on reflection on underlying assumptions, on appropriate documentation and argumentation, and on problem solving. By doing this, they will engage their students in procedures that promote the social construction of knowledge and any contradictions of it (Giroux, 1988:119; Shor, 1992:32-33). The advantages of such a dialogue can be summarized as follows (Brookfield & Preskill, 1999:17-33):

- Exploration of the multiplicity of visual
- Tolerance towards to complexity, uncertainty and doubt
- Identification and control of fundamental assumptions
- Concentration of attention during the hearing (active listening, learning to listen and understand)
- Strengthening of discernment
- Repositioning of new perspectives on a new basis
- Assistance to relate theoretical knowledge with specific issues
- Respect for the views and experiences of students
- Addiction in democratic processes
- Students' participation in the shaping of knowledge
- Conquest of communication skills for clear transmission of ideas and meanings
- Opportunities for deepening and empathy
- Addiction to participatory and active learning
- Developing of composition skills
- Transformation of the mind.

A course that serves the critical dialogue must end with unanswered questions or questions that arise from what was said or by recasting questions on another basis or in a more provocative way. This process can help students to realize that the scientific issues are subject to ongoing research and negotiation, as well as to put themselves questions during the courses. A good practice for this would to have the teacher spend the last ten or fifteen minutes of the class period to have the students write such questions and then communicate them to their fellow students or to give to the teacher for discussion at the next meeting (ibid:45-47).

However, what primarily matters is the pedagogical perspective that dialogue can be an act of freedom, which aims to develop the ability of critical understanding of the issues and for self-criticism, with the ultimate aim to serve as a catalyst for action and as an act of freedom (ibid:4-6). Besides this, according to Dewey (1916), the dialogue is a "sine qua non" component of democracy, since it is a device contribution to human development by nurturing the ability to exchange views, by increasing the availability for "giving" and "taking", by expanding the horizons of mind, and by promoting mutual understanding (Dillon, 1994).

6.2. The Critical Teaching

Critical Teaching is a fundamental process, but it is not easy, because it often causes "learning blockage" or resistance. Pre-existing cognitive patterns of students for the "good teacher" and "good teaching" lead the students to reaction or even cause discomfort. Moreover, any attempt by teachers to involve the students in active practice is perceived, many times, as a symptom of "poor teaching" (Kim, 2000).

Therefore, *Critical Teaching* is not a mechanistic process. It requires academic teachers with knowledge, experience, loyalty to their profession –also the teaching profession, of course–, innovative programs, media and infrastructure support from the administration. Despite the difficulties, however, the university can not abandon its mission: to contribute to the complexity of interpreting the world, to understand and make sense of fragmented knowledge, to establish a new epistemology for the value of life with all its uncertainties (Barnett, 2000).

7. Epilogue: The Love of Learning

Last but not least crucial point for the learning is the *Love of Learning*. A mature love of learning comes from seeing the immediate and more tangible learning task in a wider context, a context which enlarges the person, and it is the wider context which gives a long term point to learning new skills (Nillsen, 2004).

Can the love of learning be taught? Well, this seems unlikely; at least, not in the sense that certain actions will automatically lead to certain results. But even if the love of learning cannot be taught, it remains a challenge, and even today it remains a privilege, to try and create an environment in which it may occur. It is a bet to be won. And academic teachers can make the difference.

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