Restructuring Operations Management
Classes using Computer Mediated Techniques

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Abstract

This work aims to establish a teaching model mediated by computer for the discipline
"Operations Management", supplied in the course of Management of the Federal University
of Santa Catarina, UFSC. To attain this goal, will be considered not only the technical
aspects relative to the teaching of the discipline, the theoretical and practical tools (texts,
exercises and case studies), as well as the whole available tools for the computer mediated
teaching, mainly the Internet, considering its multimedia and hypermedia characteristics,
and, finally the didactic-pedagogic tools to be used.

Introduction

It is already frequent, starting from the last years of the decade of 90, the reading of articles
that stablish the future executive's profile. Almost without exceptions, they must have
entrepreneur, motivational and generalist characteristics, and also of interpreter of the
customer's needs and open to the new demands of the business. Without a doubt, this is an
ideal profile for the actual times of globalization and instantaneous communication, where
the competitors can be established far away national borders, but in fact it is not common,
at academic level, in both graduate and post graduated courses, find situations that can
generate opportunities for the utilization of these abilities.

Adding to this scenario,   increasing exigencies for personnel's recruiting in the
organizations, usually demanding a group of qualifications that include those presented.
The companies, forced for the need of remain competitive in the market where they act,
they woke up for the importance of the modernization and sophistication of their techniques
and models of decision, more and more presents in the day by day of their professionals.

WHEELER (2000), reinforcing such placements, comments that the academic system
requests urgent strategic changes; for no longer assure the attendance to the requirements
imposed by the modern society, so-called knowledge society or information society.
According to the author, in the majority of universities, antiquated practices of management
are still in use, because (mainly) of such a type of institutional corporativism. In
consequence, the universities become slow in adapting themselves to the new demands of
the environment, thus losing significant spaces as they cannot meet that requirements, and
probably reducing their survival chances.

This certainly implicates in a need of structural alteration in the teaching that traditionally has been supplied in the graduation courses, and, specifically in the case of this work, in the discipline of Production Operation supplied in the course of Management of UFSC. In the direction to that true restructuring of the teaching of the discipline, this proposal was made based in two fundamental aspects :

- approach constructivist in the teaching of the discipline, and
- use of modern techniques of teaching mediated by computer.

Constructivist Approach and Computer Mediated Teaching

The educational process, that already are changing to attend to the requirements of the technological progresses experienced by the modern society, suffers an abrupt rupture with the appearance of the techniques of Computer Mediated Teaching (CMT). The paradigms of the traditional teaching must be adapted to the new order, that demand changes in the form of organizing and supplying teaching. There is a need, therefore, to fully use of the technological resources, as required by the new and emergent teaching environments, as well as to make possible that both teachers and students improves the quality of the teaching through the use of multimedia resources.

The teaching methodology, besides the method, the theory and the practice, consider the student as the builder of your own knowledge. As established by PERAYA (1994), that states the educational system is now focused in the learning, instead of the traditional focus in the teaching. The knowledge is considered as socially built through the interaction, communication and reflection involving the learners.

That teaching environment is called collaborative. The students in it stop being mere passive spectators, turning as actors in the construction of the discipline. On the other hand, the teachers become counselors, guides or learning facilitators, instead of simply providers of information. The master, lord of the knowledge, leaves the scene, appearing the conductor, harmonic driver of a philarmonic orchestra or group of actors.

Additionally, the increasingly growth of the use of technological resources in the education, as intensive use of Internet for teaching and researches, has created a new atmosphere, call of connective atmosphere. This atmosphere transformed the several cultures and societies, first isolated, in a true "global village ", where the geographical borders vanished, the communication becomes independent of the time and instantaneous. We have a new connective environment (allowed by the technology) and collaborative (requested by the constructivist approach focused in the teaching)..

In collaborative and connective environments, both students and teachers learn, and the learning can be lifelong. WINN (1997) states that the knowledge:

· is built by the students (learners),
· is built in specific contexts, and
· is socially builted.

These are the bases of the constructivist theory and, according to the author, they lead up to the establishment of a series of positive acts, that include the following ones:

- Encouragement of the learners to assume responsibilities for their own learning, becoming future problem solvers,
- Involving learners in real possibilities, encouraging them to use primary sources data (obtained in the hyperspace or in any other place),
- Encouragement of the learners to involve themselves in dialogues, with the teacher, other learners and, in a interative form, among all learners,
- Encouragement of the rise questions and inquiries, allowing them to assume their own positions,
- Engaging the students in experiences that challenge their hypotheses, encouraging discussions among themes related to their areas of knowledge,
- Allow the students to build durable relationships, seeking the joint solution of problems.

Learning is a process through which the information becomes knowledge, and knowledge is not the same as memory (WINN, 1997). The students (learners) should truly believe in what they learn, not simply memorize it to solve questions in the classrom for having a "grade" or "concept" which represents their "capacity". They should build mental representations of the context in which are involved. These models, in agreement with the author, are known as "mental" models and they must:

- be sufficiently consistent to allow interpretation, but sufficiently flexible to adapt to new interpretations,
- be internally consistent,
- allow the student to make inferences when the information not to be totally available,
- allow the student to build and test hypotheses that serve of new sources of information,
- allow the student to describe for other people everything that he understands, and
- guide the student in the research of places where he/she can look for information and data in productive and efficient way.

The key for the construction of those mental models is the student's interaction with the information, investing the appropriate amount of efforts in a significant way. For that, there is a need in the complete reformulation of the traditional models of teaching, focused on the relations or communications teacher-students, or one-to-many, in the definition of HARASIM (1999). For stronger interactions we have interactions among students' groups, interactions student-teacher, interactions student-student and same individual techniques, called by PAULSEN (1995) of one-alone techniques.

In this model, the use of computer-based resources, including Internet, is fundamental for the creation and development of the discipline, made by the group students-teacher. This

group is the center of the model and should receive all the attentions, by of the University and also by the Society, assuring the supply of the necessary tools to build it.

Cultural changes

The transition of Classical Teaching method (presential) to the Computer Mediated Teaching should be preceded by important cultural changes for the students and for the teachers. Although this change is not so dramatic as full migration of Presential Teaching to Distance Learning, it is still important, for considering the teaching under the constructivist focus .

As stated by CENA (2000), there is a displacement of the simple reading in books for the world of the real experiences. The books are static and usually used some time after written, even could be out-phased in relation to the usual practices. Through the books, the students have little opportunity to access current information. That, of course, add value to their knowledge, even if constituted by raw information or a kind of information that simply contradicts the classic theories.

On the other hand, the use of Internet in researches can be highly stimulating. CENA (2000) tells experiences with students that had difficulty in elaborating written works, but were brilliant in elaborating multimedia presentations of their researches. "...the learning level and the success were without parallel in relation to everything that I had observed in traditional classes that just used textbooks" (p.8).

This is the fundamental change: the students stop being mere duplicaters of texts that perhaps don't understand, to became researchers and explorers, that present their conclusions with the veteran cientists' easiness. In WHEELER (2000) we can meet an allegory where " several students gather together in a lecture room to sit for two hours at the feet of a teacher. Some time later they are required to 'regurgitate' the information they have 'learned' out onto paper in a manner that is pleasoning to the examiners. If they keep to the rules they will earn a pass mark. This is a prevalent model of higher education, and it evidently hopelessly inadequate to meet many of the need of the contemporary information society." (p.1). It is also poor educational practice, as we present information in a oral format and exams in the writen format, states that author.

Another expressive change, still for the students, it is the acceptance that they build the discipline through researches, joint studies, presentations, etc, inside of a context created by themselves with the teacher's help. It is the focus change: "What I make" changes to "How I do" or "How I Interpret". The students will not depend, in the future, of avaliation process notes, but only of the process of making the correct questions, to contact the correct people or correct sites, placing everything together in an understanding form (CENA, 2000).

For the teachers, the change will also be expressive. A first concept is that the teachers stop being the masters, and their word is the absolute truth in terms of the content of the discipline, as explains MASON (1998) defining the chande of "wise" for "guide": formerly the teachers were those that knew everything and they transmitted those knowledge for the students, and their knowledge didn't admit reply. Today, the perception that everything that

can be read, saw and listened can be encountered in the Internet, shows that the traditional teachers should change. They should get ready to face new challenges with the safety of the "guides" that they should be. But here we find a paradox: prior to "guide", the teachers must be "wise" for effective guidance. At last, their knowledge is available to any one who wants to research in Internet, but their experience is not.

The change will come through the experience, that is what differentiates the "wise" of the "guide". The teacher becomes a conductor and explorer of knowledge. For that change have effect, it must happen transformations, not only in the students (or learners, as is wanted today) but, and mainly, in the teachers' new pedagogic competences. ANDRADE (1999), when emphasizing this change, affirms that the most significant influence of the education (distance or mediated by computer) won't be the technical development or technological apparatuses, but the teachers and learners professional development.

On the other hand, the support to the classes through Internet allows the amplification of the teaching, as explained by LEE, GROVES and STEPHENS (1996): Internet provides an opportunity for the teachers to teach better by the use of a series of teaching methods, instead of the old presentation pattern one-for-many, reaching more students than a simple classroom. Internet allows a maximization of the learning, as affirms some authors, when they emphasize that this maximization is given not only for the increase of the amount of learning, as for the increase of the quality of the learning.

Students and teachers will be capable to leave the learning happens in new and innovative forms, with the use of basic tools as researches in Internet, intensive use of e-mails, direct participation in the classes through presentations or reports.

A New Model

The new model doesn't presuppose only internal alterations in the discipline, but also needs support media that, interacting with him, offers the adequate bases to the development.

In several universities, mainly in those that use resources of EMC and Internet massively, like Universidad Oberta of Catalunya (UOC, 2000), the students are considered as main actors. Teaching models are centered and directly interacting with them. The student stops being a number or a mere concept at the end of the course, that passes by the University without leaving a trace, besides some occasional works. In the new model, systemic, the student is at the same time raw material and transformation element of himself (and as such it should be treated). It should have assured enough resources to participate simultaneously with the creation process and the learning process.This resources include, at least:

- Functional and organizational support by the University, including, if possible, elements (Tutors) that will serve as connection elements with the Departments and Centers of the University, not only for the courses in that they are registered, but all the others, as long as they need,
- The teachers' technical support in the classroom or not, both for teaching and orientation,

- Appropriate Tools for the accomplishment of development tasks and researches, and
- Socially appropriate ambient for the learning process.

Considering the existence of these resources, the model can be built as showed in the illustration 1, below:
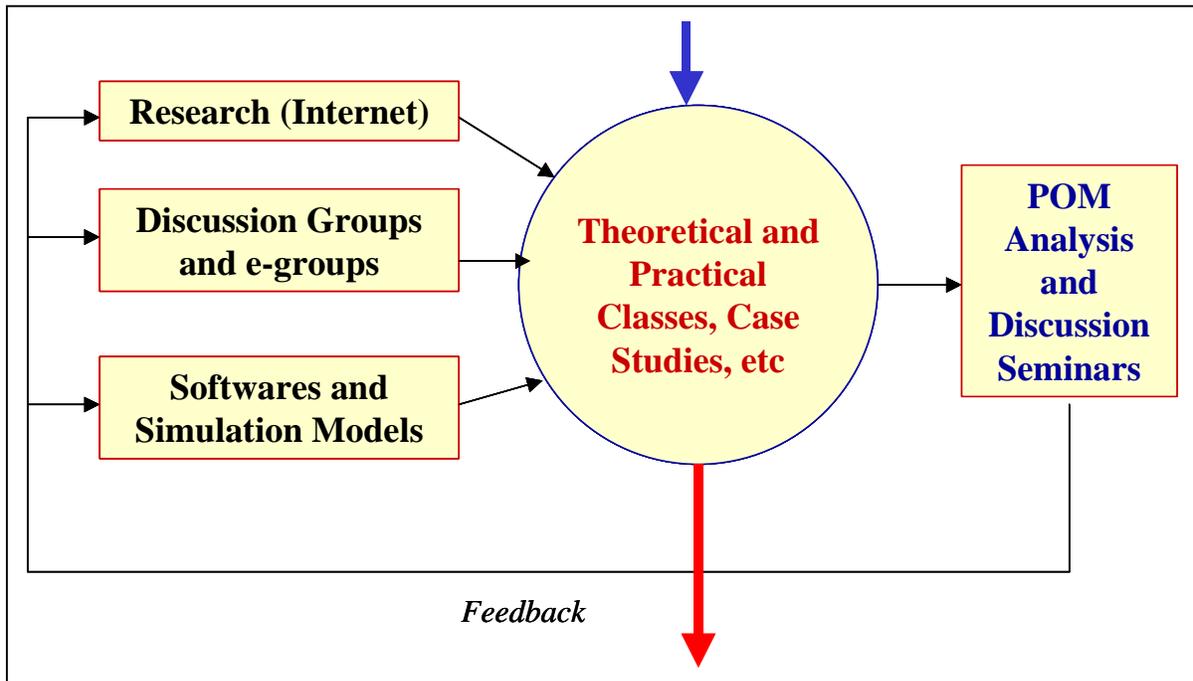

Illustration 1: I model for the Operations Management Discipline

The basis of the model continue the dialoged classroom, where the teacher presents the content of the discipline, through theoretical/practical tools permanently updated, including case base studies or specific items for analysis and discussion with the students. They (teacher and learners) must pursue an objective which is to add value to the discipline, in a permanent way, using the following cooperation mechanisms:

a) Researches in Internet: look for texts, articles, technical positions, support mechanisms, softwares, inside of an universe focused to the themes into discussion,
b) Participation in international or national e-groups of discussion of selected topics of the discipline. As second proposition, create e-groups for discussion of those selected topics,
c) Create and update small application and simulation models, based on common softwares, to represent different functions of the Production Management, like scheduling, production planning, etc,
d) Analyze and apply available commercial simulation softwares, like Pro-Model, Preactor, Arena, Auto-Simulations or others that exists in the market,

These activities would be developed by small groups of students, that would structure seminars at the end of the discipline for the presentation and discussion of the results.The results would be added to the "discipline library" for access by all students.

The evaluation outline would consider these works as substantial part of the final concept of the discipline, reserving for the theoretical evaluation the remaining component of that concept. A relationship of 80%-20%, is suggested for stimulating the students' participation in the process, first and main objective of the model.

The obtained results would be analyzed by the group teacher-students, in the seminars, in way to subsidize the development of the discipline the following semesters, in a feedback process started simultaneously by the teacher and the students. This way, permanent updating of the theoretical/practical tools used in the development of the discipline, with focus on specific points that have been judged insufficiently developed, or even worthy of constant attention.

Conclusion

This work presented a teaching model for the discipline Administration of the Production, supplied in the course of Management of the Federal University of Santa Catarina, UFSC, using an collaborative and connective approach for the teaching, looking for the transformation of students of mere spectators in actors in the construction of the knowledge. The implantation of this model was considered viable in a research done among the current students of the discipline, but it should happen in 3 to 4 semesters, in a gradual way, considering the need, also detected in the research, of cultural modification for students and teachers.

It is also recommended to provide adequate structure in the Study Group for Operations Management and Costs (NIEPC) involved with the whole process of Operations Management, in a more substantial way to assure the requirements for the students' orientation, as well as to offer them the instrumental (computers connected to Internet) necessary for the perfect acting of the work groups formed.

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