

The Specifics of the Teacher's Education Adapted Towards New Technologies

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The education of teachers in new technologies allows each teacher to understand, through his own reality, interests and expectations, how technologies can be useful, the effective use of technology by the student first undergoing assimilation by the teachers.

After all, if someone introduces computers to universities without proper attention paid to teachers, the benefit that students are going to ultimately derive from it is of low quality and usefulness. To reach positive effects it's fundamental to consider an intensive initial enabling of capacity, starting with the teachers that may incentivise their students.

Keywords Education, E-learning, Technologies

1. Introduction

The recognition of an increasingly more technological society must be accompanied by the awareness of the necessity to include in school resumes the competences to deal with new technologies. In the context of a society of knowledge, education demands a different approach in which the technological component can't be ignored.

Both new technologies and the exponential increase of information lead to a new work organization, in which it is necessary: the required specialization of knowledge; Transdisciplinary and interdisciplinary collaboration; easy access to information and consideration of knowledge as a precious commodity, useful in economic life.

Faced with that, a new paradigm is emerging in education and the role of the teacher, faced with new technologies is changing radically, for a set of activities with a didactic-pedagogical interest may be developed, such as the interchange of scientific and cultural data of different nature; the production of text in a foreign language and the elaboration of inter-university journals, thus allowing the development of learning environments centred in the activity of students, the importance of social interaction and the development of a spirit of cooperation and autonomy in students.

The teacher, in this context of change, needs to know how to orient students about where to gather information, how to treat it and how to use it, assuming the role of educator and an enforcer of self-research and the student's learning adviser, both stimulating individual work and supporting group assignments gathered by areas of interest.

The quality of education, generally centred in curricular and didactic innovation, can't be placed in the margin of available resources to proceed with innovation in educational matters, or any form of management that makes its implementation possible.

On the other hand, the incorporation of new technologies as common basic content is an element that may contribute to a greater link between the teaching contexts and the cultures that are developed outside the school ambience.

Faced with this situation, educational institutions face the challenge of not only incorporating new technologies as teaching content, but also to recognize and develop from the conceptions students have over these technologies to elaborate, develop and assess pedagogical practices that promote the development of a disposition reflexive of technological knowledge and uses.

Our current society is marked by profound changes characterized by a deep valorisation of information. So, in the so-called Society of Information, knowledge acquisition processes assume an important role and demand a professional that is critical, creative, with the ability to think, learn and sustain knowledge, working in a group and knowing himself as an individual. The educative system must train this individual and for that end it's fundamental to have an enhanced instruction that the teacher passes on to the student, promoting the construction of knowledge by the student and the development of new skills, namely capacity to innovate, create the new out of the known, adaptability to new realities, creativity, autonomy and communication. After all, it's the University's role to prepare students to think, solve problems and respond rapidly to continuous changes.

2. Teacher training and new technologies

Indeed, with New Information Technologies new possibilities are opened to education, demanding a posture from the educator and with the usage of networks in education we can obtain information in sources, such as research centres, Universities, Libraries, allowing works in partnership with different institutions; connections with students and teachers at any time and place, favouring the development of works with exchange of information between universities, countries, allowing the teacher to better work with the development of knowledge.

Access to long-distance interconnected computer networks allows learning to occur frequently in virtual space that needs to be adapted to pedagogical needs. The university is a privileged space of social interaction that must connect itself with other spaces of knowledge known today, allowing the formation of a bridge between knowledge, thus becoming a new element of cooperation and transformation. The way to produce, store and disseminate information is changing; the enormous volume of research sources is opened to all students through the internet, digital libraries replacing printed publications and long-distance courses by videoconference or the internet.

The education of teachers to this new reality has been critical and hasn't been privileged in an effective manner by policies in education or in universities. Proposed solutions are inserted mainly in education programs of post-graduate level or as human-resource qualification programs, for the profile of the teaching professional is oriented to a determined specialization, since that the necessary time for that appropriation doesn't allow for its formative generalization. As a result, the fragility of both actions and education becomes evident, reflecting economical and political interests.

The main objective of introducing new technologies in universities is to open the possibility to do things that are new and pedagogically important that can't be made in any other way. The apprentice, using adequate methodology, will be able to use these technologies in the integration of matters that are apparently airtight. The university becomes a more interesting place that prepares the student for his future, where learning is centred in individual differences and the student's capacity to become an independent user of information, capable of using several types of information sources and means of electronic communication.

To the universities falls the role of introducing these new information technologies and lead the process of the teacher's changing role, the teacher being the key player in these changes, capacitating the student to correctly research for information in several kinds of sources. It's also necessary to raise awareness in the whole school community, especially the students, to the importance of technology in social and cultural development.

The qualitative leap using new technologies may be taken in the way the course's program is elaborated and through the teacher's actions, besides incentivising the use of new teaching technologies, stimulating interdisciplinary research adapted to reality. The most advanced technologies may be used to create, experiment and evaluate educational products, whose goal is the introduction of a new paradigm in education, adequate to the information society, to re-dimension human values, deepen the abilities of thought and make work between student and teacher more participative and motivating.

The integration of work with new technologies in courses, as tools, demands a systematic reflexion about their objectives, their techniques, chosen content, abilities and prior requirements, to the very meaning of education.

With new technologies, there comes the demand for new forms of learning, new competences and new ways to conduct the necessary pedagogical work, being fundamentally necessary to continuously form the new teacher to act in this environment, in which technology serves as a mediator for the teaching-learning process.

3. Profile of the teacher

There are difficulties, through conventional means, to prepare teachers to adequately use new technologies, for it's necessary to educate to correspond to the created expectations.

The attempts to include the study of new technologies in the curricula of teacher education courses face the difficult investment required to the acquisition of equipment, the shortage of teachers capable of overcoming prejudice and practices that reject technology maintaining an education in which the prevalent method is the reproduction of replaceable models by others more suitable to the educational problematic.

Teachers are professionals that have a function of systematic recreation, this being the only form to proceed when you have so diversified a field of students and learning contexts, as happens in all levels of education. The teacher's function is the systematic creation and recreation that bears in mind the context in which the activity is developed in and the target-population of said activity.

It's necessary to stimulate research and to be open to the wealth of exploration, of discovery, for the teacher may also learn with the student and during and in the end of the process, needs to incorporate in his methodology:

- Knowledge of new technologies and the ways to apply them;
- Ability to allow the student to justify and discuss his essays;
- Stimulate research as a basis for constructing knowledge through the computer.

The society of knowledge demands a new profile from the teacher, that is: open to changes, dialogue, cooperative action, that contributes so that knowledge in class is relevant to the professional life of the students; that promotes a demanding teaching helping students to advance autonomously in their study processes and interpret in a critical fashion all knowledge and to make evident a solid general culture that makes possible for him to have an interdisciplinary practice dominating educational technologies.

The training of teachers signals the beginning of an innovative curricular organization that, by overcoming the traditional form of curricular organization, establishes new relations between theory and practice and offers conditions for the emergence of collective and interdisciplinary work, making possible the acquisition of a technical and political competence that allows the teacher to place himself critically in the new technological space.

To the teacher falls the role of being involved in the process, aware not only of the new capabilities of technology, its potential and its limitations so that he can better select what is the best use to be explored within a determined content, as well as contributing to the improvement of the teaching-learning process, through a renovation of the pedagogical practice of the teacher and the transformation of the student into an active subject in the construction of his own knowledge, leading them through the appropriation of this new language to be inserted in contemporariness.

The process of preparing teachers currently consists of courses of short duration, to explore certain programs, falling to the teacher the development of activities with this new tool next to the students, without a chance to analyse difficulties and potentialities of its usage in pedagogical practice.

These changes demand a deep curricular alteration, in which contents by humanity are the objects of knowledge, but new problems and the projects for its solutions constitute the procedures and activities that will be evaluated by universities to witness its efficiency. In truth, for innovations new tools will be required, namely the roads for communication like the internet and the teacher's capacity to tame new technologies.

To train teachers in this context demands the socialization of access to information and the production of knowledge for all, a change in interpretative models of learning passing from the traditional educational model based on instruction (that is, where teaching is constructed from the application of theoretical knowledge formulated from human and social sciences that provide grounds for education); a change of conception in the act of teaching in relation to new ways of devising the process of learning and accessing and acquiring knowledge; A construction and a new educational configuration that integrates new spaces of knowledge in a proposal of innovation of the university, in which knowledge isn't centred in the teacher or physical space, but seen as the permanent process of transition, progressively building according to new paradigms and a change in the way of conceiving the teacher's work, the flexibility of resumes in universities and the universities' responsibilities in the process of educating the citizen.

The teacher, in the new society, sees in a critical way his role as partner, interlocutor and counsellor of the student in the search of his apprenticeship, for they study, research, debate, discuss and produce knowledge, develop abilities and attitudes. The classroom becomes a learning environment, with the creation of collective work, working with the new resources that technology offers, in the organization and flexibility of contents, the student-student and student-teacher interaction and in the redefinition of his objectives.

The information that students obtain through the internet aren't just received and stored. These represent a point of departure and not an end unto themselves. When a student encounters more related information they constitute themselves into an element of his own education, identifying the importance of what he learned.

When students can exchange knowledge with colleagues from all over the world, such as libraries, research centres, universities, a whole new universe of perception is opened, the perspective of the world and reality is changed, giving way to the formation of a ore global knowledge, less limited to national and immediate borders, being able to construct bridges of knowledge, understand other cultures and other ways of understanding the meaning of reality.

The changes that are underway in all fields of knowledge move the model of education, that occurs in a determined age period of the students' life and in a determined physical space, supported in the specialization of knowledge, for a continuous education that gives importance to the subject, to reflexion and learning of its applicability to social life, grounded in the principles of citizenship and liberty.

Reflexion as a didactic principle is fundamental in any methodology, leading the subject to rethink the process in which he takes part within the university as teacher. Education must consider the reality in which the teacher works, his deficiencies and difficulties encountered at work, so that technology can be visualized as an aid and be utilized in a conscious fashion.

The process of continuous education provides conditions for the teacher to build knowledge based on new technologies, understand how to integrate these into his pedagogical technique and be able to overcome administrative and pedagogical hurdles, enabling the transition from a fragmented system of learning to an integrated approach facing the resolution of problems specific to the interests of each student. On the other hand, it must create conditions so that the teacher knows how to re-contextualize the student and the experiences lived through his education to his reality of a classroom, making the needs of his students and the pedagogical objects being reached for compatible.

This initial education offers conditions necessary for the teacher to dominate technology – a process that demands profound changes in the way of thinking, for the objective of exploratory education, besides the acquisition of teaching methodologies, is to know the learning process deeply, how it happens and how to intervene effectively in the relationship student-computer, offering the student favourable conditions for the construction of knowledge. Indeed, the emphasis of the course should be the creation of educational environments of learning, where the student executes and empowers a determined experience, instead of receiving from the teacher the matter already fully resolved.

Cooperative work as a strategy incentivising work relations between individuals is stimulating, and through it we find a model in which social gathering and self-esteem are increased. Support tools to cooperative work using new technologies are, for examples, hypertexts, e-mail, virtual classrooms. In truth, changes that technologies favour in classrooms help the students establish a link between academic knowledge, an exchange of ideas and experiences taking place in which the teacher, in many cases, is placed in the position of the student learning with his experience. During classes students are led to research and study individually, as well as to seek new information and data to be brought for study and debate in class, emphasizing an active learning and a process of discovery incentivising interactive learning in small groups.

4. Final Considerations

New technologies may have a significant impact on the role of teachers, through the constant recycling received via the network, in terms of content, methods and usage of technology, supporting a general model of learning that faces students as active participants in the process of learning and not as passive receptors of information or knowledge, the teachers being persuaded to use networks and start reformulating classes and encouraging students to participate in new experiences.

By having access to information technologies, with its application to knowledge, students will later be agents for change in the productive sector by natural influencing in its use. The adequate use of these technologies stimulates the capacity to develop research strategies; selection criteria and information processing abilities, applicable not only to the programming of activities. On the other hand, it stimulates the development of social abilities, the capacity to communicate coherently, the quality of written presentation of ideas, allowing for autonomy and creativity.

Thus, students and teachers have numerous resources that facilitate the task of preparing classes and doing research work, with the possibility of students accessing information networks worldwide during the course of the school year, regardless of their geographical positioning, amplifying their vision of the world and their capacity to communicate with people of other cultures, interests and idioms.

It is expected that in this century, it falls to the teacher to help sow both individual and collective development and that he knows how to work the instruments that culture is indicating as representative of civilized means of living and thinking, specific to a new age. For that end, much research into information technology is still needed, as well as cognitive models, interaction among peers and cooperative learning adequate to models based upon technology that orients the teacher's training in its development.

The galloping evolution of the need for knowledge imprints the need to train teachers to assume themselves as proactive agents in the management of knowledge.

References

- Bottentuit, J., Coutinho, C. e Alexandre, D. (2006). M-learning e Webquests. As Novas Tecnologias como Recurso Pedagógico. *Proceedings of 8th International Symposium on Computers in Education (SIIE2006)*. Vol. 2, (pp. 346-353). León: Servicio de Imprenta de la Universidad de León.
- Brennan, S. E. e Lockridge, C. B. (2006). *Computer-mediated communication: a cognitive science approach*, in K. Brown (Ed.), ELL2, *Encyclopedia of Language and Linguistics*, 2nd Edition. Oxford, UK: Elsevier, Ltd.
- Cornford, P. (2003). *Putting the University Online*. Buckingham: Society for Research into Higher Education/Open University.
- Coutinho, B. J. (2007). A Complexidade e os Modos de Aprender na Sociedade do Conhecimento. Comunicação apresentada no XV Colóquio AFIRSE, Lisboa 15 a 17 de Fevereiro de 2007.

- Coutinho, B. J. (2007). Comunicação Educacional: Do Modelo Unidirecional para a Comunicação Multidirecional na Sociedade do Conhecimento. Comunicação apresentada na 5ª Conferência SOPCOM 2007. Braga: Universidade do Minho, 6 a 8 de Setembro de 2007.
- Coutinho, B. J. (2007). Tecnologia Educativa em Portugal: Um Contributo Para a Caracterização do Seu Quadro Teórico e Conceptual. *Revista Psicologia, Educação e Cultura*, Vol XI (1), Maio.
- Dougiamas, T. (2003). *Moodle: Using Learning Communities to Create an Open Source Course Management System*. Proceedings of the EDMEDIA 2003 Conference. Hawaii: Honolulu.
- Duggleby, J. (2000). Como ser Tutor On-line. Lisboa, Monitor.
- Figueiredo, D. (2002). Redes e Educação: A Surpreendente Riqueza de um Conceito, in Conselho Nacional de Educação, *Redes de Aprendizagem, Redes de Conhecimento*. M. E: Conselho Nacional de Educação.
- Grenhow, C. (2007). *What Teacher Education Needs to Know about Web 2.0: Preparing New Teachers in the 21st Century*, in R. Craslen et al (Eds.). *Proceedings of the 18th International Conference of the Society for Information Technology & Teacher Education*, SITE 2007, 2027-2034. Chesapeake, VA: AACE.
- Hills, G. e Tedford, D. (2003). The Education of Engineers: The Uneasy Relationship Between Engineering, Science and Technology. *Global Journal of Engineering Education*, Vol. 7, nº 1. Austrália.
- Meirinhos, M. e Osório, A. (2007). b-Learning para a Formação Contínua de Professores. *Actas do VIII Congresso Galaico-Português de Psicopedagogia*, Vol 2, 949-964. Braga: Universidade do Minho.
- Moran, J. M. (2004). Propostas de Mudança nos Cursos Presenciais em Educação On-line. Disponível em: <http://www.abed.org.br/congresso2004/por/htm/153-TC-D2.htm>.
- Morgado, L. (2005). Novos Papéis para o Professor/tutor na Pedagogia On-line, in Vidigal, R. e Vidigal, A., *Educação, Aprendizagem e Tecnologia*. Lisboa: Edições Silabo, 95-120.
- Paulsen, M. (2002). e-Learning: O Papel dos Sistemas de Gestão da Aprendizagem na Europa. Coleção Formação a Distância e e-Learning. Lisboa: Inofor, 21.
- Reis, F. L. e Martins, A. E. (2008). Os Desafios do Professor no Contexto do Ensino Online. *Actas do V simpósio sobre Organização e Gestão Escolar*, Universidade de Aveiro, Portugal, 2-3 Maio.
- Reis, F. L. e Martins, A. E. (2008). Benefícios do e-Learning no Ensino Universitário. *Actas da 3ª Conferência Ibérica de Sistemas Y Tecnologías de Información*, Universidade de Vigo, Espanha, 19-21 de Junho.
- Reis, F. L. e Martins, A. E. (2008). *Perspectives of the Distance Education in Portugal*. *Actas da Conferência International Council on Education for Teaching*. Universidade do Minho, 14-17 de Julho.
- Salmon, G. (2000). *E-moderating – The Key to Teaching and Learning On-line*. Londres: Kogan Page.
- Silva, M. (2000). Sala de Aula Interativa. Rio de Janeiro: Quartet.
- Tavares, R. (2006). Aprendizagem Significativa em Ambiente Multimédia. *V Encuentro Internacional sobre Aprendizaje Significativo*. Espanha: Madrid.
- White, B. (2007). *Is Web 2.0 the Future of the Web?* Comunicação oral apresentada no ED - Media 2007. Vancouver, CA: AACE.