

Use of ICT in teaching at university level: A qualitative perspective of teachers

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Abstract. This document shows the beliefs of Mexican university professors hold in relation to the use of ICT in teaching. A non-probabilistic sample was used, carrying out interviews and surveys in a university located in Sonora. The evidence indicates that the professors interviewed considered ICT to be facilitators in the teaching process and believing that ICT improve the communication process among educational actors. On the other hand, obstacles for adopting ICT are the lack of formation in the field, age and unfamiliarity with their use. Even do these professors feel competent in the use of these technologies

Keywords. ICT, Information and Communications Technology, teaching, University, Teachers.

1. Introduction

The present study was carried out at a public university in southern Sonora, Mexico, which has always been known for being innovative and avant-gardist in the use of ICT in its teaching and learning processes. At present new technologies are integrated into the system and the faculty is perceived as tech-competent (Angulo et al., 2014). There are many classrooms with computer equipment and projectors, computer labs and Internet access in all campuses. Professors use these resources in their classes and give classes using their own digital didactic material, be it virtual combined with classroom, totally virtual or as support material in the classroom.

Given the frequent use professors make of ICT in teaching at our university, it is not uncommon for the professor to see it as a natural process to which he/she has had to adapt. There has been a lot of unrelated speculation about this phenomenon, ranging from support from outside the school, such as educational policies for providing educational centers with

technology, to much more support such as the educational belief or meaning of ICT in teaching, there being technological conditioning and influence in society producing a strategy of believing that the presence of ICT should be linked to strategic speeches which would guide and justify the significance of its use in teaching.

In the face of this panorama and based on the beliefs in the meaning that the faculty holds on the use of ICT in teaching, this study examined some of the variables of interest which are: a) its influence on teaching, b) its uses in education, c) the aspects which favor or hinder the use of the new technologies, d) the criteria for broadening and improving its use in pedagogic practices, and e) the benefits of possessing technological competence.

The following question is the result of these variables. What are the beliefs on the meaning the university professor has for these variables which may favor or hinder the use of the new technologies in teaching?

The objective of this study was to understand the meaning the university professor gives to those factors which favor or hinder the use of ICT and which are related to teaching; and specific objectives were 1) Describe the perception of ICT in teaching held by university professors, 2) Analyze the perceptions the faculty has in relation to the variables which hinder the use of ICT in teaching, 3) Analyze the perceptions the faculty has in relation to the variables which favor the use of ICT in teaching, y 4) Discover the perceptions of the faculty in relation to the factors which hinder or favor the use of ITC in teaching, and the research question of this study was What are the meanings which the new information and communication technologies hold for university professors, resulting from the use by these professors of ICTs in their teaching?

2. Concerning Theory and Background

The use professors make of ICT in teaching may have different meanings depending on the context in which they are used. Adopting ICT in teaching is an important factor in professors' assuming reflection and analysis of their potential. However, most professors have not formally integrated ICT into their teaching. Up to the present, the process of integration has been due to the professors needs for working with ICT in order to improve their teaching strategies and keeping up with new technologies, albeit superficially and technically, which has not led to improved results in students' performance as was the hope in the second wave at the beginning of the 90s (Boza, Tirado & Guzmán-Franco, 2010). Some studies with outstanding results on the beliefs and meanings of ICT in teaching held by university professors were made by Andrade (2014); Briceño and Benarroch (2013); Boza et al. (2010); Riascos-Erazo, Quintero-Calvache and Avila-Fajardo (2009); Barros, Cavaría and Paredes (2008); and Acevedo, Vázquez, Acevedo and Manassero (2002).

Some of the variables which may favor or hinder the use of ITCs in teaching are those related to infrastructure, leadership of the principal, organization of the school, curriculum and teacher-related aspects (Angulo, Torres and Valdés, 2013). With respect to the professor, we live in an information and communication society in which education is traditional and the role played by the professor is irreplaceable, even though the use of ICT in education has increased. Some factors which may negatively influence the appropriate use of new technologies by professors are: a) not having pedagogic formation in the use of ICT, b) the lack of technological and digital competence and c) not adopting a positive attitude towards

adopting ICT in teaching.

With respect to the first aspect, teacher training, today we are immersed in an educational system which has historically been traditional and which requires special preparation of teachers in the new methodologies which will transform the classroom into a scenario mediated by new technology. The integration of ICT into teaching is a process of adaptation, making it important to identify whether the teacher is using it as support for his/her teaching or as a didactic means and resource to achieve objectives. The latter is an indicator of technological competence and of changes in teaching methodology and therefore teacher training in the use of ICT seeks to produce professors who are autonomous, efficient, responsible and critical in their use of ICT. Pedagogical training in ICT use must be constant and permanent and must have the objective of providing teachers with the digital knowledge and abilities necessary for teaching and not only train them in the habitual use of ICT.

Studies on competence in the use of ICT in teacher teaching (Angulo, Mortis, Pizá and García, 2012; Trigueros, Sánchez and Vera, 2012; Angulo et al. 2011) show low levels of ICT use in teaching due to the low levels of digital competence and lack of evaluation of the training that does exist with respect to the use of ICT in pedagogical practice. However, those professors evaluated aver that they are more technologically competent in the knowledge and functional use of equipment and informatics programs for developing educational processes, as well as in searching for, gaining and processing information.

3. Methodology

- Type of study. A qualitative study with a phenomenological perspective was carried out. Creswell (2014) established that phenomenological studies accomplish a detailed description of the meanings individuals place on various aspect of their lives, with the understanding that these aspects influence the way in which people live and act in certain roles they play in life.

- Participants. A non-probalistic sampling was used. Theoretical saturation reached a total of 20 in-depth interviews and 40 surveys which included questions on the areas of interest. For the interview 10 full-time professors and 10 teacher's assistants were chosen; and for the surveys 20 full-time professors and 20 teacher's assistants were chosen. The key informants were chosen based on their similar profiles of giving courses (experts) in computing centers or at least using ICT (test-case) as a didactic digital resource in teaching within the university of our study.

- Techniques. In order to obtain a solid description of the meaning professors assign their subject of research, in-depth interviews and surveys were used. To determine the validation of the content, previously they were subject to the judgment of experts in educational technology and the use of digital didactic resources in conventional and non-conventional spheres.

- Validation of the study. Full understanding of the problem and the results, as well as the validation and credibility of the study, were reached through the triangulation of the techniques implemented, rating the content by expert researchers and the various participants having similar profiles involved.

- Procedure for data collection. In a first instance, consent of the professors was sought for access to the field of study, previously explaining the purpose and benefits of the

results to each; finally total confidentiality was guaranteed.

4. Results

Topic I. Beliefs held by university professors in relation to the use of ICT in teaching.

The university professors perceive the use of ICT in teaching in accordance with two essential elements: a) ICT as communication tools, and b) ICT as facilitators in the teaching-learning process. Taking into account these two elements, they think of ICT in pedagogic practice as a novel tool which makes the teaching practice easier.

Interview 19: “They mean innovating in our classes, our teaching methods and learning for you [sic]. It is the use of new sources, new tools, to enrich our classes.”

Survey 1: “They are an indispensable tool, in the classroom, as well as for communicating.”

Survey 7: “They are tools which make the teaching-learning process easier and which adapt to the needs of time and space.”

Topic II. Perception on how ICT influence teaching practices.

The teachers perceive the use of ICT in teaching favorably since they help in planning the class, in communicating, presenting and offering information to students.

Interview 6: “They are a positive influence since you are in direct contact with the student because we can communicate via computers.”

Interview 17: “They influence when they have to search for information, write papers, they do have a great impact on the development of my students.”

Survey 5: “They are deciding factors in planning my courses.”

Survey 12: “They improve the communication and dissemination of information between teachers-students.”

Topic III. Perceptions on the uses they may give ICT in education.

Professors think of ICT in education in various ways. They connote the terms education and learning. Their perception focuses on digital didactic resources, class design, strategies for teaching and research.

Interview 7: “They can be as platforms, the creation of virtual classes, the creation of tools, didactic materials, as learning objectives. They could even be for designing different activities for developing strategies within the process itself.”

Survey 1: “They are very diverse, as audiovisual, research, writing aids, studying technical programs, etc.”

Survey 7: “Designing courses, evaluating learning, giving courses and research.”

Topic IV: Perception of the factors hindering the use of ICT by the teacher.

The answer for teachers about for perception concerning factor hindering the use of ICT in education were grouped in three categories: a) lack of training and update, b) the resistance change, and c) ‘fear’ and lack of access and resource (Fig 1).

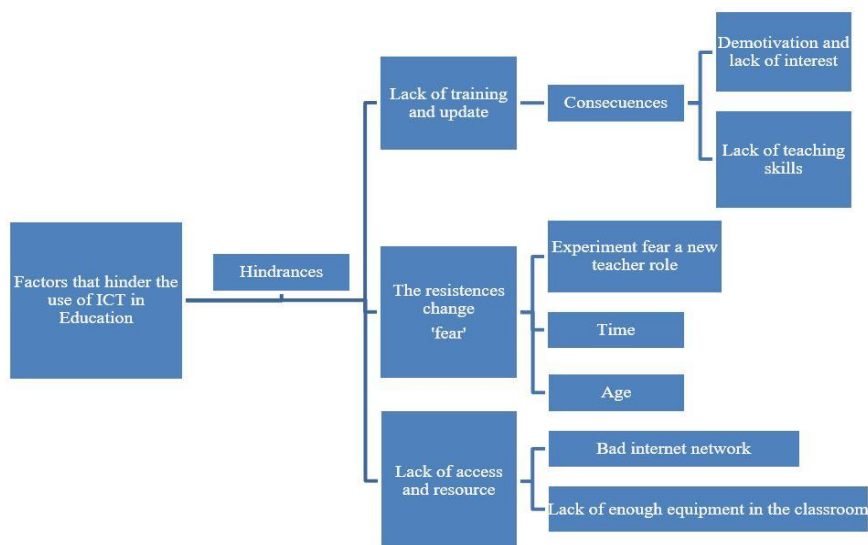


Figure 1: Perception of the factors hindering the use of ICT by the teacher.

Lack of teaching: In this category teachers responses are grouped into demotivation and lack interest, as also mentioned the lack of teaching skills that can occur due to a lack of training and update e their teaching.

Survey 1: The lack of budget in educational institutions, lack of training in certain technology.

Interview 17: "Ignorance and lack of training."

Survey 11: The lack of knowledge of available technologies to support education resistance to change "fear" This category three characteristics, fear of experiencing a new teaching role, time and age were pooled. In some cases they prefer to keep the comfort of the methods through their careers have been used because they feel safe because it has worked.

Interview 20: "The factors that hinder teachers from I think the resistance ..."

Survey 2: The lack of access to resources, lack ICT or resistance to technology.

Survey 8: Fear to change or illiteracy (sic) Technology".

Survey 17: "Ignorance and not trained to use them for the same age."

Survey 10: Lack of training, access and time to develop learning objects lack of access and resource here the responses from teachers regarding their perception they were doing evil systems and Internet networks and to the lack of equipment in the classroom considering them as obstacles

Survey 4: "I do not have internet in the classrooms"

Interview 7: A bad system networks or internet or damaged technical equipment and lack of training of teachers for the use of ICT.

Survey 17: Lack of internet in every classroom of the institution, more training, and the institution pays certain rights to use certain programs.

Topic V: Perception of the factors that favor increased use of ICT by the teacher.

Regarding the factors that favor the use of ICT in education, teacher perception is

oriented towards the resources that exist in the entire University study, earning categories; motivation, communication and update (Fig 2).

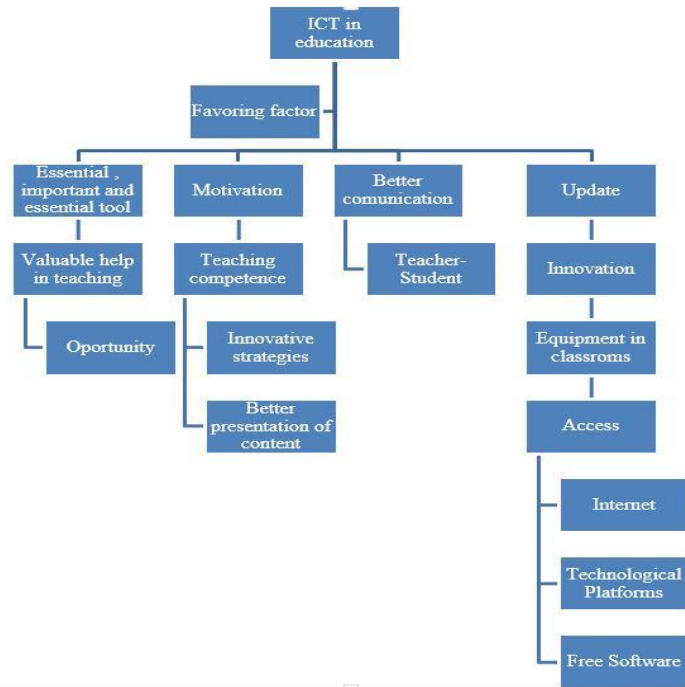


Figure 2: Perception of the factors that favor increased use of ICT by the teacher.

Motivation: Search perception of teachers as to the factors favoring lies in acquiring skills; where they are implemented innovative strategies and presented in a better way the contents in class.

Survey 7: Promotes the content of a self-regulating manner with the student.

Interview 6: Contagion to see other teachers use them, self-learning, use of tutorials on how to make materials online courses offer you more personalized.

Survey 19: In certain areas often requires classes and illustrate the use of the technologies is very favorable.

Survey 1: Teacher education, training, etc. Better communication in this category teachers perceive ICT as favorable allowing better communication between student-teacher.

Survey 8: The advantages of asynchronous and synchronous provide support for apprentices.

Interview 19: That can better explain the practical classes update search the responses of teachers was characterized to innovation, obtaining as favorable factors in the use of ICT equip classrooms for better internet access, technology platforms and free software.

Interview 1: "The platforms of information, access to technology and especially refresher courses are very important."

Survey 3: "The existence of (sic) technology platforms in college, laptop, internet,

etc."

Survey 4: "Having internet in college."

Survey 12: "Infrastructure and training that we provide."

Topic VI: Perception as to the benefits of being proficient in the use of ICT to develop teaching.

The teacher appreciates competent from the need to be updated and trained in the use of ICT in education, this is how established a better quality in their work, streamlines the class, strengthen the teacher - student relationship, it is innovative when using new teaching strategies achieving meaningful learning in students.

Interview 18: "I say it is profit to be more creative , more innovative , that's what I think more could be the benefits you may have with the teacher, the use of new teaching and learning strategies that may also favor in the process and that students learn more with the media. "

Survey 3: "We can be more (sic) empathetic with youth and also other ages that can change their education."

Survey 11: "Improving the quality of your work, and speeds up the work of making educational materials."

Analysis

The object of the present research constitutes a psycho-social phenomenon, since it is the beliefs and meanings the professors give ICT in the process of teaching. The teacher, the main actor in university teaching, bases his/her beliefs and actions on the meaning which he gives to things within his context. He believes that it is here where he builds meanings based on the social interactions he lives. However, this space also influences him/her, making him or her reflect and make decisions which modify the meaning based on the interpretive process which he may carry out as a thinking, intelligent subject.

The results show that university professors who participated in this study believe that the use given to ICT in teaching is a novel tool which facilitates communication, teaching and learning processes. This in part is in keeping with Barros, Cavaría and Paredes (2008), who considered the role played by ICT in the teaching-learning process relevant in areas such as better quality, dynamics, and enrichment of communication and depth of learning, among others. This point of view may be related to the constant use each professor makes of new technology in the classroom, although this practice does not guarantee quality teaching. Its integration depends on multiple factors such as training, curriculum, planning and carrying through, infrastructure and equipment, Internet quality, the professor's attitude, technological and digital competence, and media and information literacy, among others.

With reference to the influence of ICT on teaching practices in which the opinion of the university professors focuses on planning, presenting information and communication, the outcome found by Andrade, Bozo and Cendrós (2011) show results related to the present investigation since the professors think that implementing new technology is necessary and they say that they would never refuse to use ICT in their academic activities. No doubt the use of ICT somehow integrated into the curriculum has led teachers to systematize and administer their activities both inside and outside of the classroom. With reference to the findings related to the use of ICT in education, professors perceive these to be digital

didactic resources, for planning classes and strategies of teaching and research. The use of ICT in the educational context should not be based merely on technical and pedagogic change, but also adapt itself to new technological proposals, link them to didactic research and access to these, although the latter is a recent pedagogical revolution with new paradigms in the art of teaching (Díaz-Barriga, 2013; Pérez and Salas, 2009). One of the main duties of university professors is research, making it apparent that new technology, at least at the university of our study, is used, among other things, to produce, apply and spread scientific knowledge.

With respect to factors which hinder the use of ICT by professors, this may be attributed to a lack of training in the use of ICT, resistance to change, age and unfamiliarity, which produce uncertainty and a lack of technological competence. Other factors which influence the use of ICT in classrooms equipped with technological devices are: pedagogical adjustment and usefulness, support for the teacher, availability and access in the classroom, and technological competence (Badía, Meneses and Sigalés, 2013). On the factors which promote greater use of ITC by professors we find that these focus on the availability of resources at the university of our study, for example Internet access, technological platforms, free software, workshops on ICT and equipment in the classroom; there is also the added motivation of electronic communication with students. The factors which favor good ICT practices by professors in the classroom are related to their integration and innovation (Colás and Casanova, 2010), which is necessarily closely linked to the professor's personal and professional context. Finally, the professor feels he/she is competent if he/she has had training and refresher courses in the use of ICT in teaching, and this in turn is reflected in benefits in the quality of his/her work, strengthening teacher-student communication, and mastering and implementing innovative strategies aimed at significant learning by students.

Notable coincidences of this study with the contributions of Vergara (2005) were found, specifically in the difficulty for the researcher in differentiating the borders between meanings, beliefs and knowledge of the professors who participated. There was also coincidence in the meanings given to the use of ICT in the process of teaching, in relation to the process of formation of those interviewed since the age they gave during the interview showed that some were trained in the ICT sphere while others were not.

5. Conclusion

Never before has a professor's job been so complex, presenting so many opportunities and challenges (Pedró, 2004). The objective of this study was to understand the significance that the university professor places on those factors which facilitate or hinder the use of ICT and which are related to learning. Undoubtedly the university professor's indiscriminate use of new technology in teaching plunges him/her into the practical and novel meaning, at the same time, it leads him/her to think that the process of integration and thus significant learning by the student has been reached. It is clear that the professors who were interviewed use ICT in the teaching process, they think of them as facilitating tools for teaching; they acknowledge the importance of incorporating them into the curriculum and the classroom. Moreover, technology improves communication between educational actors. However they also perceive that there are obstacles in adopting ICT due to their own lack of formation in

the field, their age and unfamiliarity of their use; all of these factors empower the professor who manages to use ICT, giving him/her a sense of innovation and competence in the use of ICT in his/her teaching.

The increase in the use of ICT as support for traditional teaching and in non-classroom circumstances should be conditioned so that professors, in the first place, think about the variables which affect their being incorporated into the classroom or not; this because formative processes have changed and will continue to change; and secondly being technologically competent is not enough. The digital competence of professors is another matter which is pending, since beyond the basic use of technology and conventional programs there are five other important elements. These are: 1) Media and information literacy, 2) technological and information competency, 3) multiple literacies, 4) generic cognitive competency, and 5) digital citizenship (Adell, 2012).

Finally, in this phenomenological study we learn some of the beliefs which university professors have on the meaning of the use of ICT in teaching, thus contributing, even taking into account the limitations of the study, evidence to this complex object of study, meanings. Despite answering the questions presented, there are still doubts on the line of investigation which may help researchers make more in-depth studies of this kind:

What meanings do you give to media informational, digital and technological competences in teaching using ICT?

What meanings do university professors give to the school context?

How do training and refresher courses in ICT affect the meanings university professor have?

What other variables or elements should be included in research of this type in order to discover the meanings given by teachers to the use of ICT in their teaching?

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