AN OPINION SURVEY OF TEACHERS ON THE USE AND APPLICATION OF INFORMATION AND COMMUNICATION TECHNOLOGIES IN HIGHER EDUCATION

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Abstact

This research was conducted to address the need for training and support required by teachers in a Mexican institution of higher education in the use and integration of Information and Communication Technologies (ICT) in their teaching. To achieve this, we conducted a study to identify the mixed type of training and support needs with teachers in the area of ICT for education. In the process of data collection instruments were used as the questionnaire and semi-structured interviews, which were applied to three groups of teachers who formed the sample selected for this study. To respond to the research questions, namely what are the training needs in the field of ICT require teachers? and What are the types of support they require teachers to use ICT?, there were a series of individual interviews to six teachers in this institution, three key pieces in the administration of it. In addition, an opinion questionnaire applied to 95 teachers.

Overall, the study identified the needs and support that teachers need to integrate ICT in their work and also made clear the need to establish, for academic communities, measures and criteria to guide the formation of the same in the use and application of technological tools.

Keywords: Information and Communication Technologies, Higher Education, Teacher training.

1 INTRODUCTION

The following study was realized at a business school in a Mexican University. The University runs four majors in bachelor degrees, ten different master degree programs, two doctorate programs. These are made up by 12 thousand and 300 students. This University has done great efforts to integrate educational technology and methods of academic excellence in its educative programs to provide its students tools so they evolve successfully in an international business environment.

The school focuses on preparing professionals so they develop in a business environment. In most cases, the professors work in an industry and or have a self proprietor business, this way they develop their professions along with teaching at the University. This can represent an advantage but also a disadvantage, meanwhile, experiences of professional practices can be transmitted to the students while on the other hand these professors are limited on time to dedicate to their Teaching formation and/or actualization.

1.1 Problem Overview

One of the factors that may be considered among the causes that has prevented a better integration of the ICT in the Mexican Institutions of higher education is the generalization aspect. Indeed, a study done in an Organization for the Cooperation and Economic Development (OCDE) (2001) states that most professors in countries of OCDE are 40 years old or older and because of this the integration of the ICT in the classroom will be a longer and more complicated process due to the lack of formation needed to adapt to the new technological tools. The educational institute which was analyzed in this study faces this problem, since 35.9% of its professors adjust to this profile, according to the obtained statistics in this study.

1.2 Definition of the Problem

A revision of the specialized bibliography concerning the area of the application of ICT in the education proofs that authors such as Dawes (1999) and Watson (1997) have documented the failure in professors as they perform with a significant use of technology in the classroom. Other investigators have concluded that even if Universities make the effort to form professors through courses about the

use of ICT and their scholastic curriculum, these courses seem incapable of providing professors the skill and attitudes needed to apply the ICT meaningfully and successfully in education. (Williams, Coles, Wilson, Richardson & Tuson, 2000).

The Institution of Higher Education where this study was done does not excuse itself from this problem. Therefore, the objective school of this study has done great efforts considering the technological equipment in its classrooms: they all have a computer and an integrated projector. There is also a Computer science club which has seven different labs, each one with 45 updated computers and an additional computer lab with 20 computers exclusively for faculty staff. Additionally, it includes the technological platform Nexus, which is the official virtual platform of the university.

Because of this cognition it is essential to evaluate the level of technological literacy that the professors have so that afterwards they correct their deficiency making them carry out their ICT skills in the virtual learning community. The design of this community was an approach to correct the technological literacy of the professors like the users as well so afterwards they would be trained so that they are capable to form and manage themselves in a virtual learning community.

1.3   Investigation Questions

The following investigation questions are proposed:

- What are the professors opinions about the integration and application of ICT in teaching?
- What effects will the virtual community have over the formation and support of the professors to integrate the ICT to the processes in teaching and learning?
- What is the opinion of the participating faculty in the virtual learning community over its usefulness to form and support the professors of the applications of the ICT?

2   METHODOLOGY

2.1   Types of Investigation

In this investigation the intention was to determine the experience that the professors require of a University Community in particular to achieve a better implementation of the ICT at work. With the purpose to respond accordingly to the investigation questions, an exploratory and descriptive study was chosen to be done.

2.2   Sample Population and Selection

For the specific case of the questionnaire that was applied. The size of the sample has been measured using $n=((Z(s)/E)2$. Meaning that n is the population that concerns of 467 individuals, Z is the value of the degree of confidence determined at 95% and that on the distribution table the normal curve corresponds to a value of 1.96, S is the standard deviation and E is a considered error by the investigators, in this case it is a 5%.

The standard deviation is considered to be taken in account, the results of a previous study that determined that the 50% of the professors do not use technological resources (Araiza et al. 2003). What it establishes that 233 professors are above the median and 233 are below the median which this turns out to a standard deviation of 116. This institutes us to a sample size of 95 professors.

To select the size of the sample the systematic sampling method was used with a group and the others were chosen by the method of volunteers to form part of the virtual community. The investigators programmed with them beginning session, in which the study was explained to them and what it consisted in and it was asked of them to if they agreed to participate, they'd sign to be well informed and consent, in which the model of the consent was of an adult.

The instruments and techniques that were used to obtain this data were: The survey and the interview to the focal group, and the respective groups formed inside the sample.

3   THE RESULTS

The results of the Opinion questionnaire. Another one of the instruments used to obtain information which could provide answers to our first two questions of the investigation, was the application of an

opinion questionnaire, in which was investigated profoundly the needs of the formation and types of support that professors have to integrate the ICT in their teaching.

The obtaining of this information through this questionnaire was divided in three stages. In the first stage, personal information of the participants was collected; in the second stage, information was recollected over the previous experience of the workers concerning the use of ICT and the integration strategies; in the third information was collected over the opinion of the teaching in the classroom and the formation needs that teaching has concerning the integration of the ICT, such as the availability of the resources, the skills related to the use of the ICT, the measure in which those whom were interviewed use strategies and resources on teaching in the classrooms and the needs of the formation that the teachers need to integrate the ICT in their curriculum.

Results from the first stage of the questionnaire. In the first part of this instrument, general information was collected from the participants. What was asked of them was their gender, age, major and years in teaching and specialty in teaching. These results are shown in the figure 1, 2, 3 and 4.
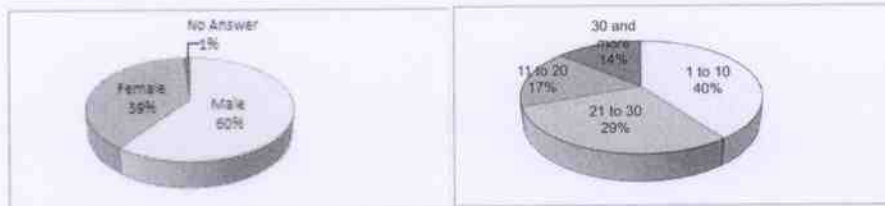
Fig. 1 Gender of the participants.　　　Fig. 3 Years of experience in teaching.
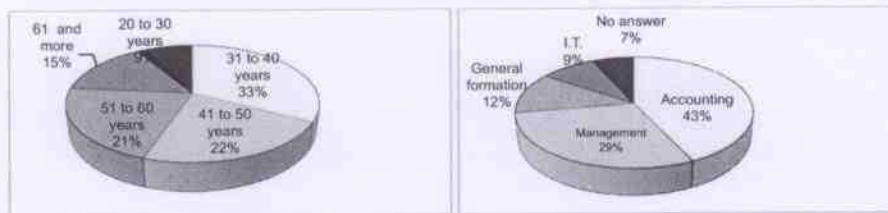
Fig. 2 Participants ages.　　　　　　Fig. 4 Participants majors.

Results from the second stage of the questionnaire. In the second stage of the questionnaire recent information was obtained about experience that professors claim to have with ICT use and the strategies that they are familiar with in reference to the integration of the usefulness in teaching. This data is shown in figure 5 and 6.
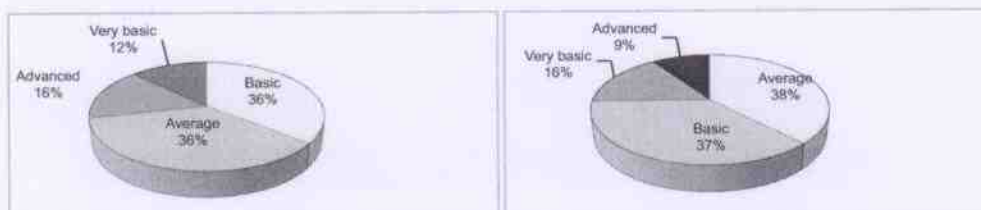
Fig. 5 Level of formation in ICT. α=.772　　　Fig. 6 Experience in integration of ICT. α=.772

Results of the third stage of the questionnaire. In the third stage of this questionnaire information of the following was collected: a) the opinion of the participants in terms of their perception of the curricular integration with the ICT, b) the opinion of the participants in terms of the resources that they have available in the institution, c) information in terms of skills related to the use and integration of the ICT with the professors, d) measure in which the strategies related to the use to ICT in the classroom are used, e) measure in which the technological resources are used during the impartation of lecture and f) information about the formation that the professors have concerning the use of integration of the ICT shown in the figures 7 to 37.
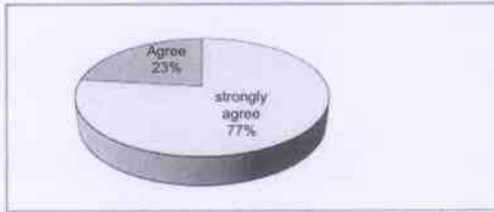
Fig. 7 It is important to incorporate ICT in the students formation. α=.779
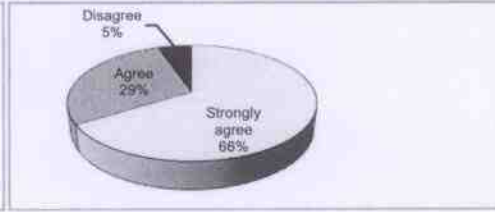

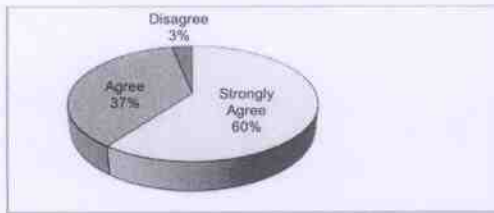Fig. 8 ICT facilitates the communication between Teachers and Students. α=.779

Fig. 9 ICT facilitates communication between Professors and their colleagues. α=.779

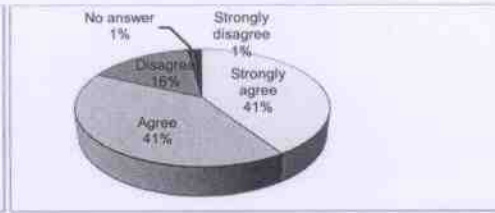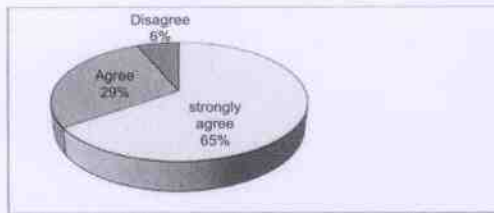Fig. 10 ICT helps incorporate parents in the educative process. α=.779

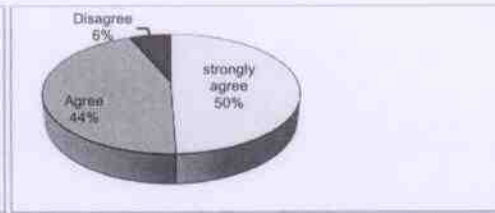Fig. 11 ICT motivates Teacher and students more in class. α=.779
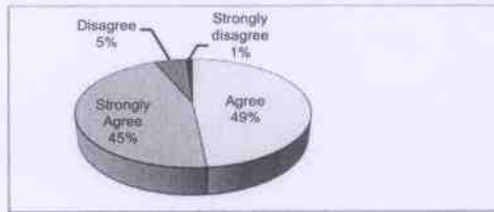

Fig. 12 ICT helps tutor the students in learning. α=.779

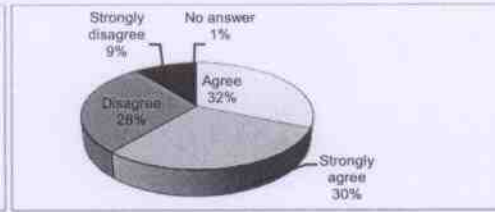Fig. 13 ICT Helps to evaluate the students learning. α=.779

Fig. 14 ICT use expands the digital gap and generates inequality. α=.779

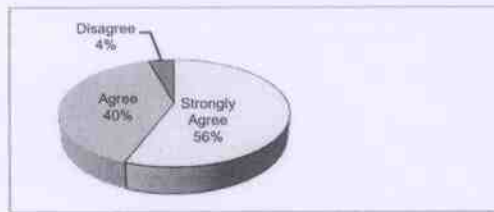Fig. 15 Formation in the use of ICT facilitates innovations and strategies. α=.779

Fig. 16 The opinion about planification and preparation of ICT classes versus time. α=.779
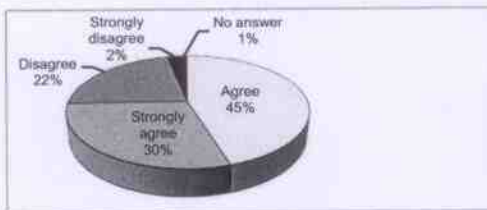
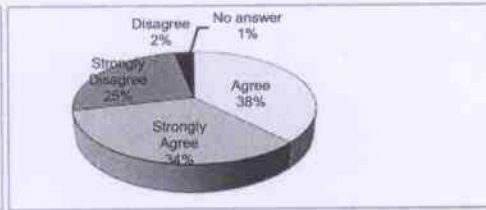Fig. 17 The resources have low formation in order to use and integrate ICT. α=.779

Fig. 18 Students know more about ICT than teachers do. α=.779

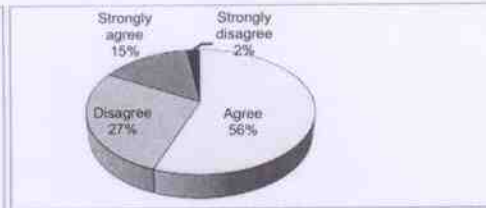Fig. 19 ICT and the computer cannot replace the job of the professors. α=.779
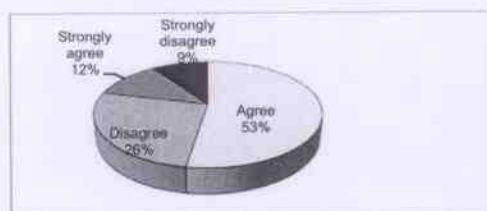

Fig. 20 The resources ICT has in the schools is enough α=.759

Fig. 21 Computers and the internet connection are accurate. α=.759

Figure 24. There is a projector and available computer in classrooms. α=.759

Fig. 22 There is educative software for my major. α=.759
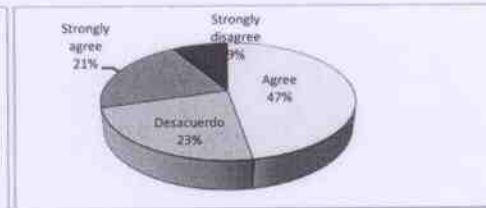

Fig. 25 There are computers that students can work with. α=.759
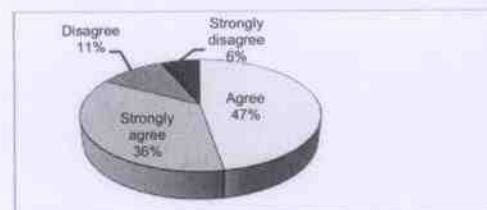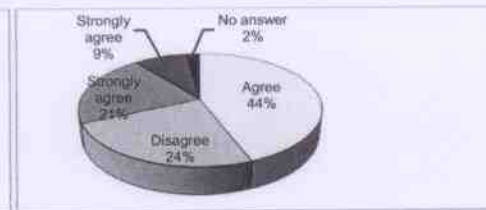

Fig. 23 The available resources have good maintenance. α=.759

Fig. 26 The Information system club are not enough. α=.759
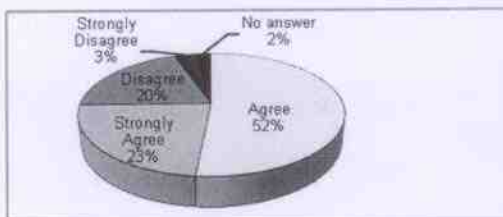
Fig. 27 There is availability to occupy Computer Science Labs with Teaching. α= .759
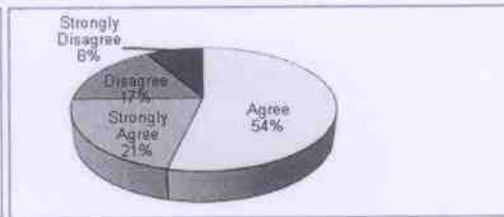
Fig. 28 The Internet at School is easy to use. α= .759
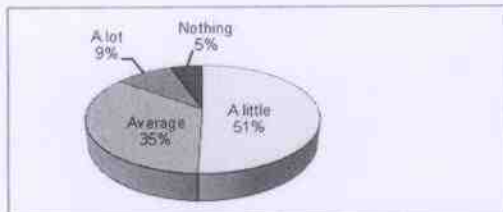
Fig. 29 Knowledge of the Basic Skils on ICT by the Proffesors. α= .865
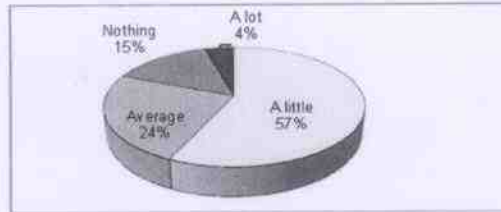
Fig. 30 Participation in Technology Courses by the Teachers. α= .865
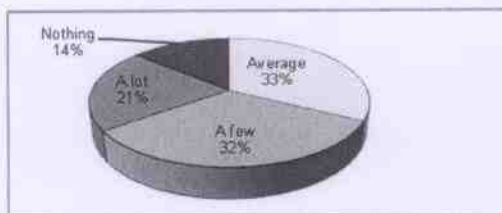
Fig. 31 Use of the Net for Class Preparation by the Teachers. α= .865

Fig. 32 Use of the Net for the development of classes by the Professors. α= .865
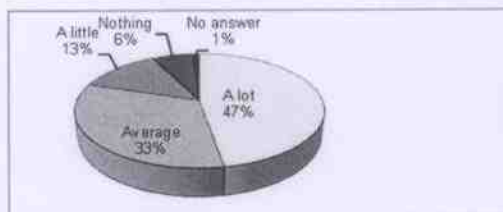
Fig. 33 Use of the E-mal by the Professors. α= .865
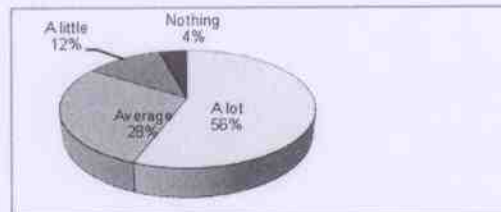
Fig. 34 Use of Presentation Software for a lecture in Class . α= .865
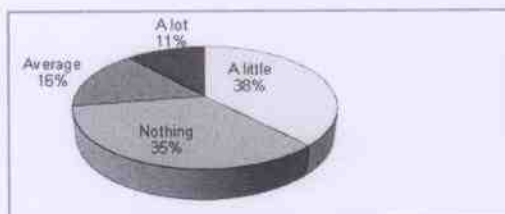
Fig. 35 Participation of the Teachers in Virtual Learning Communities. α= .865
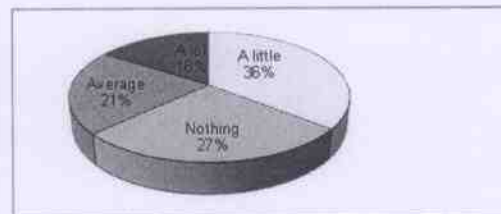
Fig. 36. Use of Contents in Platformsfor the Development of the Classes. α= .865
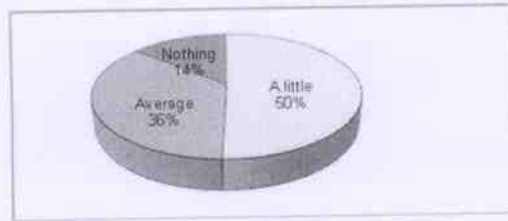
Fig. 37 Opinion about the Use of the ICT on
the Administration Processes of Teaching.
α= .865

On the other hand, the results also revealed that the professors do not stimulate the use of technologies with classroom projects and small projects, WebQuest or information search for projects made in the classroom. The answers given by the teachers are shown in Table 1.

Table 1. Distribution in the use of teaching strategies in the classroom.

| Resources Used	Very little	A little	Average	A lot	No answer
	%	%	%	%	%
Exhibition lecture	5.26	16.84	45.26	31.58	1.05
Exhibition lecture with computer aiding	6.32	11.58	35.79	46.32	0.00
Cooperative or group works	5.26	25.26	42.11	27.37	0.00
Cooperative or group work with computer aiding	10.53	23.16	38.95	27.37	0.00
Projects and micro projects in the classroom, WebQuest or information search by projects	27.37	35.79	21.05	15.79	0.00
Students' Exposition	9.47	17.89	37.89	33.68	1.05
Students' exposition using the ICT in group works	13.68	16.84	38.95	30.53	0.00
Case studies	15.79	24.21	36.84	23.16	0.00
Case studies with computer aiding	20.00	37.89	24.21	17.89	0.00
Self-learning through aiding teaching by computer aiding	29.47	28.42	22.11	17.89	2.11
Charts	12.63	29.47	40.00	17.89	0.00
Charts with computer aiding	21.05	26.32	29.47	22.11	1.05

*$p < 0.01$. **α = 0.919

Generally, it can be seen that professors prefer to continue using traditional teaching style strategies, as it is shown by the fact that the results which represent approximately 50% percent of teachers shown that they prefer to keep implementing traditional teaching strategies without using computer aiding.

The results about how the professors apply the technological resources are shown on table 2, the results about the need of the education needed by the professors related to the use and integration of the ICT are shown on tables 3.

Table 2. Distribution in the use of the resources by the professors at the institution.

Resources Used	Very Little	A little	Average	A lot	No answer
	%	%	%	%	%
Multimedia Projects	12.63	15.79	28.42	42.11	1.05
Educational software	23.16	33.68	26.32	16.84	0.00
Websites	12.63	26.32	23.16	37.89	0.00
E-mail	8.42	16.84	23.16	51.58	0.00
Administration software	24.21	36.84	25.26	11.58	2.11
Word processor	8.42	28.42	28.42	32.63	2.11
Spreadsheet	14.74	25.26	28.42	30.53	1.05
Data bases	22.11	32.63	25.26	18.95	1.05
TV, video, DVD	33.68	26.32	21.05	17.89	1.05
Video camera and photos	83.16	68.42	35.79	11.58	1.05
Scanner and printer	31.58	26.32	23.16	17.89	1.05
Speaker	9.47	12.63	27.37	50.53	0.00
Clic training programs	35.79	37.89	15.79	7.37	3.16
Educational platforms	42.11	33.68	12.63	9.47	2.11
Slides	46.32	26.32	12.63	10.53	4.21
Text editors, audio, etc.	33.68	24.21	26.32	11.58	4.21
Books and printed materials	11.58	28.42	82.11	70.53	7.37
Electronic resources	11.58	15.79	35.79	33.68	3.16

*p < 0.01   **α = 0.920

Table 3. Professor is need of training in the use of the ICT.

Needs of training in the use and/or creation of	Strongly Disagree	Disagree	Agree	Strongly Agree	No answer
	%	%	%	%	%
Utilitarian Tools	0.00	3.16	31.58	65.26	0.00
Multimedia presentations	0.00	2.11	32.63	65.26	0.00
Integration strategies of the ICT in the classroom	0.00	1.05	32.63	66.32	0.00
Websites	1.05	13.68	36.84	48.42	0.00
Educational software	2.11	14.74	35.79	47.37	0.00
Multimedia audio and sound tools	3.16	4.21	41.05	51.58	0.00
Learning tendencies about teaching supported by the ICT	1.05	4.21	35.79	58.95	0.00
Internet and Web environment	2.11	3.16	32.63	61.05	1.05
Experience communication in a learning community	2.11	4.21	33.68	58.95	1.05
Education demanded by knowledge society	1.05	33. 68	33.68	62.11	0.00
Specific websites to integrate in teaching	2.11	2.11	32.63	63.16	0.00
Use of the ICT in virtual learning environments	0.00	3.16	28.42	68.42	0.00
Basic skills in the ICT	0.00	1.05	31.58	67.37	0.00
Integration in specialized virtual learning communities	0.00	6.32	31.58	62.11	0.00
Didactics suggestions in the integration of the ICT	0.00	2.11	34.74	63.16	0.00
Training oriented to the integration of the ICT in the school curriculum	0.00	5.26	28.42	66.32	0.00

*p<0.01. **α= .940

4 CONCLUSIONS

The answers obtained prove that the professors are willing to take the challenges of the innovations in the ICT area; also they consider being prepared in the use and implementation of the ICT in teaching, as a professional duty.

The institution must explore other ways to offer the qualification to the teachers and promote the use of virtual teaching communities, first because they allow the professional development and self-learning, second because knowledge can be shared and progress is collective, third because this allows the existence of cooperation between professors.

It is important to highlight that this projects must be seen as institutional, comprehensive; teaching oriented, and must involve the whole institution. This means that the institution needs to be involved in quality improvement processes, therefore in teaching innovation processes based on the ICT. In order to develop the processes in educational institutes, motivation and judgment of the professors are needed, along with a dynamic institutional commitment to carry out and prove the changes.

Thus, facilitating and promoting the integration of the ICT to the school curriculum by the professors will depend essentially on the elements that can make this process easier and at the same time attractive in order to allow the entrance of the ICT integration to the institution on its life as an educational organization, on its development projects and global operation. This means that the existence of minimum structural conditions is needed in order to achieve a successful ICT implementation inside of the educational institutions.

This study showed that the recommendations about training followed by the institution under study are based on traditional models. From this and the successful experience of the participant professors in the virtual learning community and workshop, comes the need that the institution has to break the established path, teaching the professors in the same environment of their education, this means to learn by action, using the technology in their own learning process.

It results evident that the incorporation of the ICT to the teaching process requires of a transformation of the teacher's staff, as it is useless to incorporate technologies if there is no change in the components of didactics process, as it is teacher's training. It is strongly recommended the creation of support cells that support the technique, pedagogy and didactic of the teachers to incorporate the ICT to their work, this must be oriented to direct and support the teacher's staff to install, maintain, handle, apply and use the ICT on their daily activities.

The results of this investigation showed that the technological applications that the professors know better are the most commonly used, this data can support and justify future investments in the area of staff training on the tools that according to this study are the one used more frequently by the professors, as the use of technological platforms and multimedia material designs. In fact, the study proved that the use of the ICT as a didactics support component for conventional teaching and distance education. From the poor integration of the ICT in teaching can be deduced that a poor training staff was performed. Even if the level of knowledge in the use of technological tools is average, its poor use in practice shows the low level of training in how to apply it in teaching as manifested by the professors.

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