

Integration of ICT in teachers of POLISAL, UNAN-Managua

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ABSTRACT

The objective of this research was to analyze the level of integration of ICT by university teachers of the Polytechnic Institute of Health (POLISAL) in the teaching process, for which a descriptive, correlational and analytical study was carried out. Data on socio-demographic and labor characteristics, ICT used by teachers in teaching, institutional strategies to integrate ICT in POLISAL, teachers' attitude and the level of ICT integration at the teaching level were examined. Statistical analysis was descriptive and analytical with the non-parametric correlation test, Kauf-Tau-C. Among the main results was that the attitude of teachers toward the integration of ICT is recessive, but positive. Regarding the level of ICT integration, 58% of teachers are at the level of adaptation and 36% of teachers, at the level of adoption.

1. INTRODUCTION

Research on the use of Information and Communication Technologies (ICT) in education is not a novelty; in fact, since the 1970s, a diversity of research on the curricular integration of ICTs has been done. The results of the research indicate that the **process** of curricular integration of ICTs is **slow** and that in the way it goes through a series of stages. As Marchesi (2007) points out, in the Latin American context, "it is not enough to equip schools with computers or digital services" (quoted by Barriga, 2012, p.133). Likewise, it agrees with Moreno and Pozo (2008) who affirm that the adaptation or importation of ways of teaching and habitual contents is not enough, but a real innovation in the curriculum and the teaching is necessary, if congruence with the Concept of educational quality is pursued.

The studies of ICT integration have been developed from many perspectives but the best known at the Latin American level is the classification developed by Sandholtz, Ringstaff and Dwyer, (1997, p.3) based on the studies carried out by the project Apple Classrooms of Tomorrow (1985), which defines five levels for the integration of ICT in teacher's chairs: access, adoption, adaptation, appropriation and invention. Taking up the previous classification, this study evaluated the level of integration of ICT in the teacher's chairs of POLISAL UNAN-Managua because they make use of

the technologies, but were not trained in the pedagogical use of ICT. The results of the study serve as a baseline to develop institutional policies that bring ICT to the proper **curricular integration** with the teaching-learning processes, as well as identify weaknesses and needs that will allow the planning of appropriate decisions for teachers to strengthen the use of educational technologies.

The general objective of the study is to analyze the level of integration of ICT by the teachers of the POLISAL during the teaching process, breaking this down into the following specific objectives: describe the socio-demographic and labor conditions of teachers, identify the ICTs that POLISAL teachers use during the teaching process, describe the strategies used by the authorities to integrate ICT, identify the attitudes of the teachers of POLISAL towards the integration of ICT, determine the level of ICT integration (use, management and attitudes) and identify the grade of correlation between teachers' attitudes and the level of ICT integration.

2. MATERIAL AND METHOD

The study has a mixed approach, according to the methodological design. The type of study is **analytical** and according to the method of study is **non-experimental**. According to the time of occurrence of the facts and registration of the information, the study is prospective, and according to the period and sequence of the study is cross-sectional. According to the classification of Hernández, Fernández and Baptista (2010), the type of study is Correlational.

The area of study was the "Luis Felipe Moncada" Polytechnic Institute of Health, located on the southern side of UNAN - Managua, north of Villa Fontana. The study population consisted of 52 teachers working in the Departments of Nursing, Clinical Bioanalysis, Anesthesia and Reanimation, Physical Therapy and Nutrition. From the quantitative approach, no sample or sampling technique is calculated because all the teachers working in the POLISAL that already met the inclusion criteria were taken. From the qualitative approach, the sampling was done for convenience, which consists of selecting study subjects who have important information.

The instruments were the questionnaire administered to teachers, the semi-structured interview that was applied to the Director of POLISAL and three directors of the Departments and the focus group that was applied to some teachers. The questionnaire is an adaptation of the standardized test to measure the integration of ICT by teachers, which took into account the use, dominance and attitudes of teachers towards ICT in the teaching-learning process (Orantes, 2009 and Nóbile, 2014). This was validated by two experts in educational technology, and the internal consistency index was measured with the Cronbach alpha, giving a coefficient equal to 0.869 which is considered a **suitable** internal consistency value.

The data generated from the questionnaire were analyzed using the SPSS V.23 program, in which descriptive statistics were used, such as the data distribution table and measures of central tendency. Inferential statistics using the Kendall Tau C test were also used to evaluate the correlation between the variables teacher attitudes and level of ICT integration. For the qualitative analysis of the interviews and the focus group, the Word text processor was used in which descriptive, analytical and later categories were created (Gibbs, 2012, pp.66-74), and then the reports were made. To add rigor, breadth and depth to research, methodological triangulation was performed because it is used when applying multiple methods, empirical materials, perspectives and observers (Alvarez-Gayou, 2003).

3. ANALYSIS AND DISCUSSION OF RESULTS

As for the socio-demographic characteristics of teachers, the results indicate that the average age of the teachers of POLISAL is 40 years, in which using the analogy of Prensky (2010), means that more than half of the teachers are digital immigrants and therefore were born before the technologies and have had to be trained in the use of ICT, and the other half, are digital natives, so they were born and have grown with the advancement of technologies, so they are skilful in the use of these. The predominant sex is female, probably because in the POLISAL health care courses are offered (except medicine), and these traditionally have been exercised by women.

Most of the teachers under study belong to the Department of Nursing, because this department offers four careers, followed by Clinical Bioanalysis that offers two careers and then the others. The minimum number of hours a day devoted to teaching is two and the maximum 14 hours. *Figure 1* shows that the first quartile indicates that teachers spend between four and six hours a day. The second and third quartiles indicate that 75% of teachers dedicate between six and eight hours a day to teaching and the remaining 25% between eight and ten hours. It is also possible to observe atypical values of teachers who spend less than two hours and others with values between 11 and 16 hours dedicated to teaching.

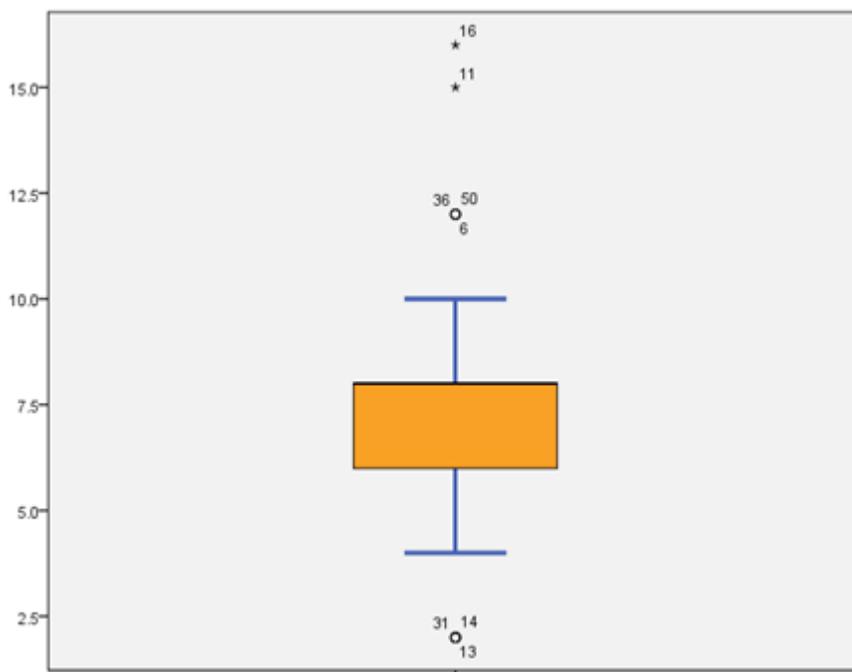


Figure 1. Number of hours that POLISAL teachers dedicate to teach.

From the point of view of the **access dimension** of the digital gap, POLISAL teachers have three scenarios where they use ICTs, these are: their cabins, their houses and the classrooms. However, they have access to a computer with an Internet connection only in their cabins and in their homes, but not in classrooms, because the Internet service is lacking and often the laptop and projectors are in poor condition, hampering the teaching process with the use of ICT. Contrary to the latter you can see different conditions in students because they have some mobile devices like Tablet or smartphones with Internet connection and are constantly consulting everything that the teacher exposes in the classroom.

Álvarez and others (2013) state that in higher education institutions with a focus on integration, technological and pedagogical aspects must be harmonically considered, in line with the educational policies of the specific context in which they are integrated. This is an institutional weakness because there are no policies or regulations for the integration of ICT in UNAN-Managua or POLISAL. In fact, until this moment they are being built. The institutional documents that only mention the use of ICTs, which can be mentioned is the *Educational Model, Normative and Methodology for Curricular Planning (2011)*, and the Annual Operational Plan, in which only mentions the use of ICT as objectives, as a policy and also as an activity. However, no document refers how ICTs have to be integrated.

In Figure 2 it can be observed that 96% of the teachers show attitudes from **agreement** to **very agree** to the integration of the ICT and only 4% is indifferent. However, in the interview with the director of the POLISAL and department directors it is evident that there are different opinions on the attitude of teachers toward the integration of ICT. Among the teachers' attitudes toward ICT integration are positive but recessive¹. Orantes (2009) argues that attitudes function as mental models, give the person a positive or negative preference over the object, a situation with which they are in contact, the attitudes of teachers can vary from completely According to the advantages to those who see them as a threat that threatens the teaching-learning process.

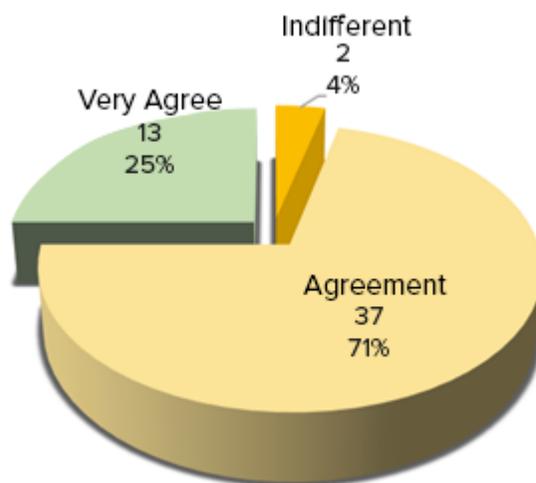


Figure 2. Teachers attitudes toward ICTs integration.

As for the level of integration of ICT, some of the teachers are in the adoption phase and the majority, in the adaptation stage. These results indicate that teachers are in the adoption phase and have developed knowledge about the use of software for editing presentations, fix some flaws in their equipment and use the office package very well.

Teachers who move in the adaptation stage have developed advanced knowledge and skills in the office package, image editing, e-mail and searchers. Teachers have also begun to produce educational materials with ICT such as digital text creation, control of assistance with the spreadsheet, use blogs or groups in social networks to establish communication with students, guide research in reliable sites and they use educational videos that download from YouTube or they record for students, using the video recording software of their cell phones. Among the

1. RAE: Action and effect of retreating or back off

activities that guide the students are: expose in class using ICT, use some software such as word processor, Excel, image editors and videos to perform tasks and conduct research with ICT.

As for the data obtained, the correlation between the attitude of teachers and the level of integration of ICTs, there is no evidence to indicate the relationship between the two variables.

With $r = -0.103$, which shows a very weak negative correlation, and a $p\text{-value} = 0.287$, lower than the established critical level $\alpha = 0.05$. With the evidence of the statistical hypothesis test and the manifested by the teachers in the interview and focus group, we conclude rejecting the research hypothesis, which indicates that the attitude of the teachers of POLISAL is not related to the level reached in the integration From ICT to the teaching process.

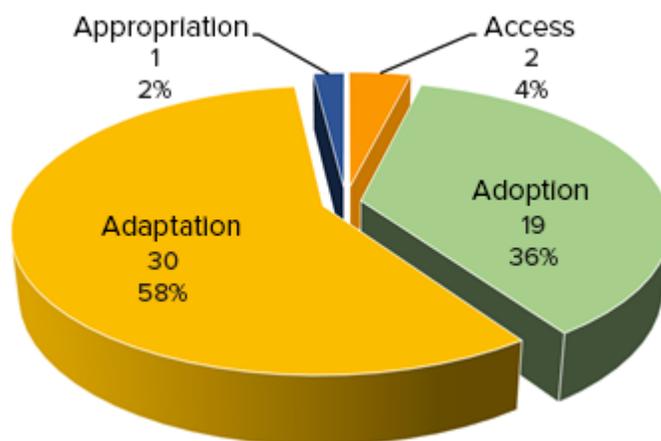


Figure 3. Level of integration of ICTs in education.

4. CONCLUSIONS

From the results obtained and the relevant findings described in the discussion of results, the present study arrived at the following conclusions:

- As for the socio-demographic and labor conditions, the female gender predominates. Half of teachers are under the age of 40 and the other half are older. The prevailing academic level is mastery. The department with more teachers is Nursing, followed by Clinical Bio-analysis and Physiotherapy. Most teachers spend between four and eight hours teaching.
- Teachers have the right conditions to integrate ICT in the teaching process at work and at home, specifically have desktop computers with Internet connection and installed applications of the office package. The need for internet in classrooms is evident.
- POLISAL does not have a defined strategy for the integration of ICTs. Everything is done in an empirical way, although it is mentioned in the document Model Educational, Normative and Methodology for Curricular Planning (2011), of the UNAN - Managua. The trainings received by the teachers are focused on the use of these technological tools and not on the pedagogical use of ICTs.
- The attitude of teachers toward ICT is recessive but good, indicating that they are aware that the integration process must be carried out.
- The applications most used and dominated by POLISAL teachers are those of the office

package, however, they use groups of social networks to communicate with students, to answer questions from them and to record the procedures they perform in laboratories. They also use ICT to develop classes and guide student exposure through the use of ICT.

- f. With the data in this study, according to the statistical hypothesis test, the interviews and the focus group affirm that there is no relationship between teachers' attitude towards ICT and the level of integration.

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