

Educational Technology in Teaching Mathematics: A perception from students of FAREM-CHONTALES

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Abstract

This quantitative exploratory research has a number of student perceptions of UNAN MANAGUA, FAREM-CHONTALES, according to the use of Information Technology and Communication (ICT) by teachers who teach subjects of mathematic cohort. The ability of students to use technological tools in their learning is being analyzed. As a sample 75 students participated in this research of various degrees existing in the University. To obtain this information was applied a survey structured with a Cronbach's alpha of 0.709 was used. It is concluded that students liked to teach mathematics with technology tools, and especially teachers in their classrooms should use ICT as a key element of university mathematics update.

Introduction

Currently in Nicaragua, the different technological tools are being focused on teaching in different educational levels. Unfortunately, the efforts made remain under the real necessities that exist in the way ICT (Information and Communication Technologies) are used in primary and secondary schools all over the country. According to the World Economic Forum, the capacity of the nation to the use of ICT and improvement of the level of knowledge and welfare of its population is almost at the bottom. Until 2014 our country was the one hundred twenty-four out of one hundred and forty-eight countries that were involved in the study (Castillo, 2014).

In the primary and secondary modes changes are being noticed in alternative teaching methods applied by teachers, yet there is so much that these methods have to do with the effective use of technological tools in the classroom.

In this regard, universities of our country invest in infrastructure projects, laboratories, connectivity, general technology as well as equipment and software virtual platforms. However, they have not focused on the particular characteristics of teachers or factors that could influence both the use and the appropriate way to integrate ICT in their teaching practices. This includes both extrinsic aspects like time, training, support, political or institutional regulations, among others, as well as intrinsic, related to personal characteristics such as age, gender, training, attitude and availability toward technology integration teaching practices. Many times, not considering these characteristics cause that the investment in technology is not utilized properly.

FAREM-CHONTALES reality

The teaching of mathematics at National Autonomous University of Nicaragua, Managua, has always been singled out in relation to poor academic performance of students. In this sense, Regional Campus Chontales does not escape that reality, there have been alarming cases in previous years, in which only two students approved the subject of a total of thirty-four.

In different evaluations to students by the coordinators of the major, they express to be concerned about the core subject of mathematics, their learning achieved are insufficient due to their self-preparation as to the methodology used by the teacher and it would be interesting to use these technological resources for the class to be more attractive and relevant.

ICT has been implemented at FAREM-Chontales sporadically as a teaching tool to develop the teaching and learning of mathematics, as offering new ways to teach, learn and achieve competences in this subject, allowing ample learning opportunities and interaction among students and motivation, thinking skills, but mostly, trying to contextualize knowledge. Therefore, it is seen as an excellent didactic element that designs spaces and environments based on the cognitive requirements of students.

Therefore, it is essential to improve the participatory learning process, through the application of classroom sessions with technological resources that motivate students to be interested in the subject. So the Royal Academy of Language (2011:3) states:

“It’s not useful for an elementary or secondary teacher to have a great command of Mathematics if he does not know how to teach their students. Nor are useful didactic theories or knowledge of teaching tools if he does not know first, who must learn, what their interests for knowledge are, under what conditions he student can study at home, what is their level of care, in which cultural and social environment he operates or, in the case at hand, the skills they may have on the use of ICT tools”.

Materials and methods

This study is exploratory and is based on the quantitative paradigm. The study population consisted of five hundred and fifty students from National Autonomous University of Nicaragua, Regional Campus Carazo, which at that time were presented in the summer courses that the University offers at the beginning of the year. Proportional stratified random sampling was used, therefore, seventy five students were selected as substantial and heterogeneous sample that would obtain enough information to carry out this study.

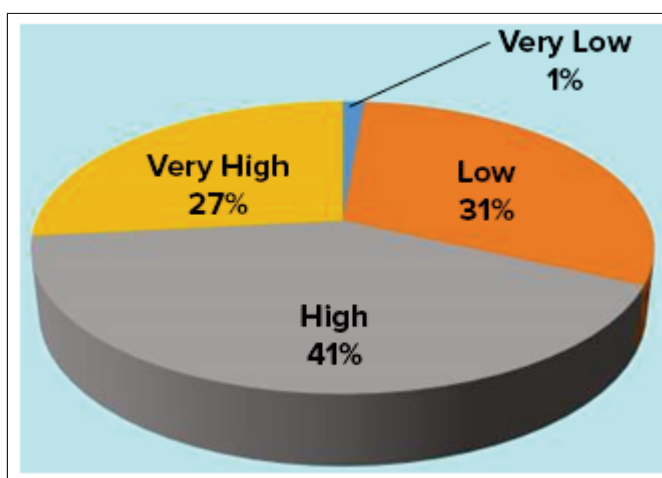
In order to know the attitudes and opinions of students on the use of ICT in their classroom sessions, a survey of thirty-four items, previously validated statistically was applied. Its structure is mixed, typical of this type of research seeking attitudes and opinions. (Hernández, Fernández and Baptista, 2010; Cook and Retechartd, 2004).

To check the internal consistency of the developed instrument, Cronbach's alpha coefficient, based on the average correlation between items (George and Mallery, 2003) was used. The validity of an instrument refers to the degree to which the instrument measures what is proposed to measure (George and Mallery, 2003). The reliability of the instrument was 0.709, allowing to assert that the internal consistency of the items is acceptable.

Results Analysis

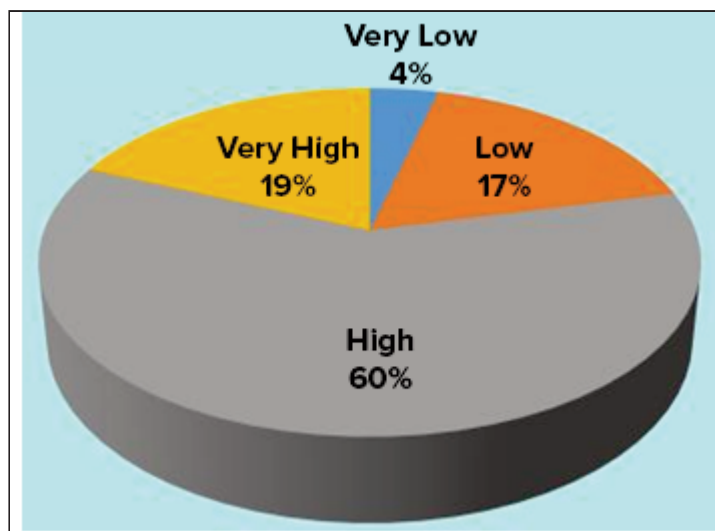
Here, the relevant aspects that came to light in the processing of the survey are detailed. This is a first approach to the problem under study.

Motivation is an important factor in the educational process, so in the first picture, students say their math teachers motivate their students' classes by 72% between high and very high, so good insight is appreciated. Now, in Picture No. 2, notes that teachers themselves provide pedagogical climates that provides the ideal environment in the classroom.

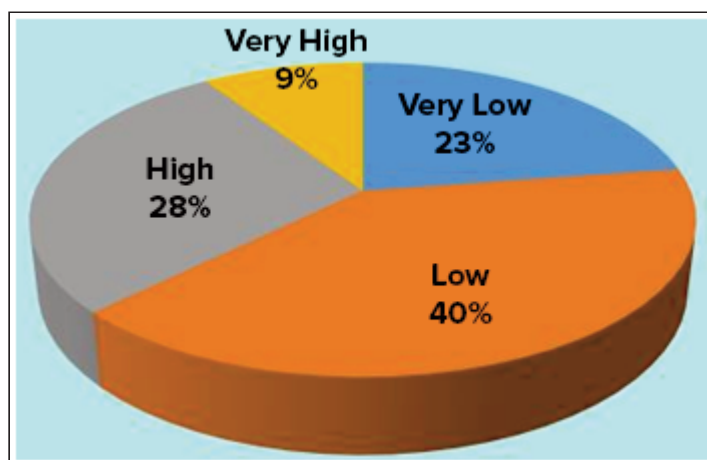


Picture No. 1. Teacher promotes a pleasant climate
(Source: own elaboration)

According to survey taker, the methodology used by teacher is very value, the 79% between high and the highest. It is necessary to realize that a sector doesn't describe it as a right worthy. This make us to ask ourselves, what are the methodological aspects that didn't like to the students? Where did the teacher fail?

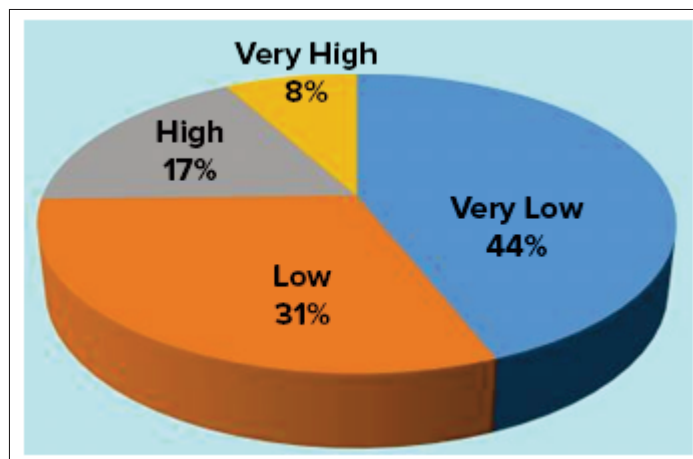


Picture No. 2. The methodology used to teach mathematics is appropriate.
(Source: own elaboration)



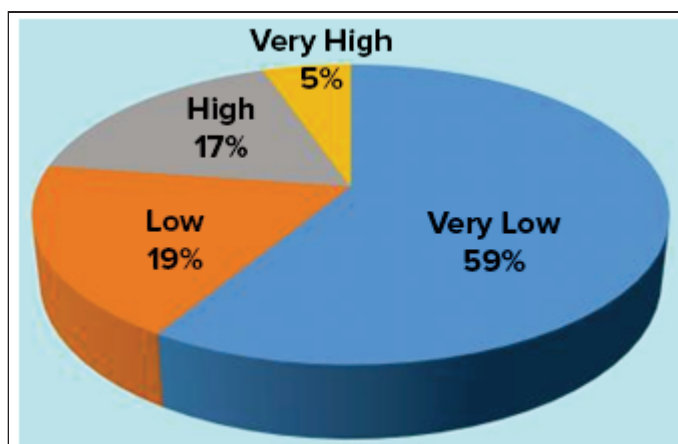
Picture No. 3. The teacher uses technologic resources.
(Source: own elaboration)

Picture No. 3 shows a reality in math classes because the technological resources are not being used to teach the subject, 76% think the use of software is rarely used (see Figure 4).



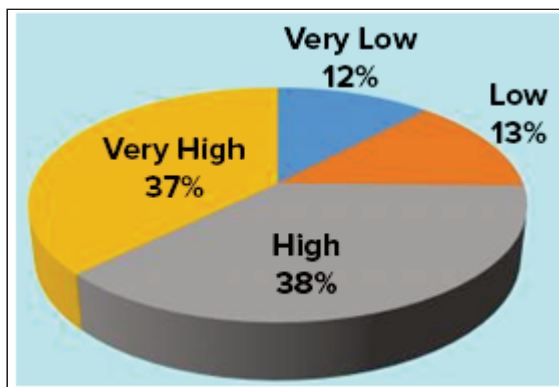
Picture No. 4. To reinforce the teaching content makes use of mathematical software.
(Source: own elaboration)

Is very interesting to see Picture No. 5, more than the half of students (78%) affirm that they don't use the labs to make strengthen for mathematic learning, this is something worrying in the ICT implementation in the teaching and learning process of students.



Picture No. 5. The teacher uses Computer Labs to teach Math
(Source: own elaboration)

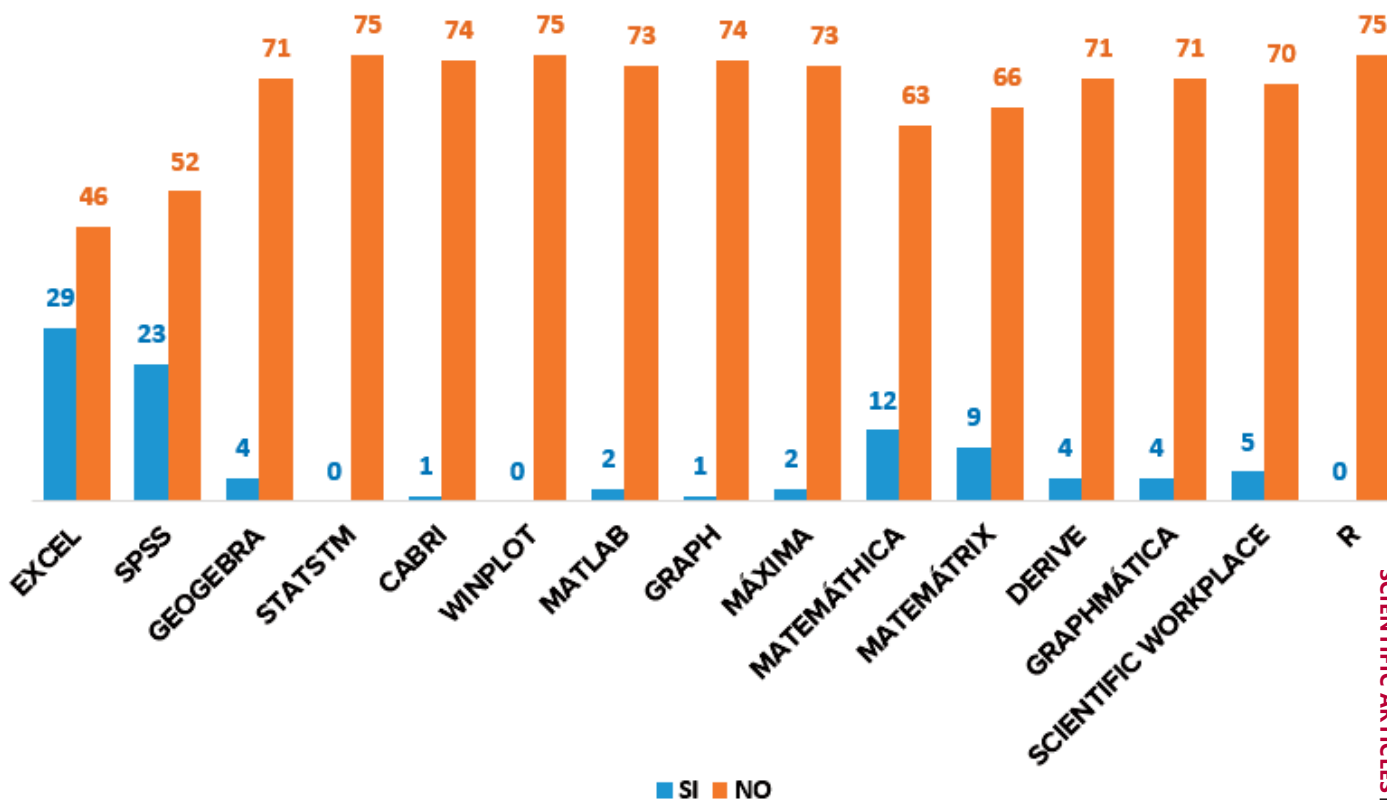
Picture No. 6 shows an encouraging outlook for the appropriate use of ICT in teaching own math courses. There is a positive acceptance in the students; this will allow future research effectiveness with the Information Technology, Communication and the use of mathematical the software in the learning of pupils is verified.



Picture No. 6. Use the ICT allow you a better comprehension (Source: own elaboration)

Picture No. 7 demonstrates that the programs that are used in math class are Excel and SPSS, below is the Mathematic program, the latter comes third product of its use as part of the Ph.D. Program in Applied Mathematics that he is teaching at UNAN-MANAGUA, FAREM-CHONTALES. This makes them feel the need to know why and what they are not used logical implications that would arise if implemented as part of an improvement plan within the same teacher meta-cognition are.

If the set of context, students said their teachers used the software and those who said no, a staggering almost 91% of respondents reflected expressing their teachers do not use software in teaching the subject, something that You should concern various university authorities to monitor the innovation and change in higher education.



Picture No. 7. Software used by teachers in Math classes (Source: own elaboration)

In Table No. 1 we reflect some opinions that provide the use of ICT in the cognitive domain of students. Between high and very high the Department of Economics reaches 78%, Technology and Health Department, 73%, while Educational Sciences and Humanities 77%, allowing it to reflect on the possible contrast between what the students thinks and what the teacher does.

Table No. 1. Use of ICT in the cognitive domain of students
(Source: own elaboration)

Academic Department	The use of ICT allows a better subject comprehension				Total
	Very Low	Low	High	Very High	
Economics and Administrative Sciences	3	0	5	6	14
Department of Technology and Health	4	9	21	14	48
Science Education and Humanities	2	1	2	8	13
Total	9	10	28	28	75

The following chart (Table No.2) shows the importance of the academic year. The valuation for the teacher and the uses of the technology resources is very limited. It offers apparently some evidence of the necessity to change the attitude of the faculty relational to this topic.

Table No. 2. Use of technology resources to teach
(Source: own elaboration)

Current scholar year in course	Teachers use technology resources to teach their classes				Total
	Very Low	Low	High	Very High	
Primero	1	2	0	0	3
Segundo	5	6	4	2	17
Tercero	4	10	7	2	23
Cuarto	3	11	10	2	26
Quinto	4	1	0	1	6
Total	17	30	21	7	75

Conclusion

a. Constantly in educational practice, teachers, need strategies to facilitate the learning of their students. This aspect is intertwined with the great variety of technological tools in our digital era. Unfortunately, these tools are not being usefully in the teaching of mathematics, maybe for two reasons:

- Low level of knowledge of teachers in the use and management of TIC
- Undervalued and negative attitude towards the need for updating and application of ICT in teaching mathematics.

b. It is concerned to know that despite having computer labs; teachers make little use of them, something that motivates them to continue investigating the reasons for this attitude. Another interesting aspect that came to light is that teachers mainly used as Excel and SPSS

tools support the teaching-learning process of students.

c. It should be recognized that in the absence of introduction of these alternative and complementary forms teaching mathematics, the routine practice of teaching practice focuses on the issue-write-listen-take notes and refusing new possibilities for motivation, context, and relevance on learning.

d. Be involved in the possibility of changing the ways of transmitting and communicating knowledge (in this case ICT) as this would open the possibility of inducing

e. We note the significant and rapid change has had and will continue societies of the present and the future, and therefore, we must reshape the dynamics of development and management.

f. It is considered essential to further working this area, in order to improve teacher practice and, therefore the mathematical competence learning in students.

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