

Use of Information and Communication Technologies in Public Schools of the State of Tocantins: Teachers' Perception

Iara N. F. de Souza¹⁺, Gentil Veloso², Francisca M. S. Costa¹ and Jos éItamar M. de Souza Junior³

¹ Department of Education – UFT (Universidade Federal do Tocantins); Palmas, Brazil.

² Department of Computer Science – UFT; Palmas, Brazil.

³ Graduate Program of Systems' Computational Modeling – UFT; Palmas, Brazil.

Abstract. The necessity of teachers' training has motivated numerous debates in the Brazilian educational scenario that has mobilized several public agents unleashing educational policies. The National Plan for the Formation of Teachers of Basic Education is a program aims to encourage and induce the provision of quality higher education to teachers acting in public schools. Learning using Information and Communication Technologies has induced cultural changes in the paradigms of school systems. The daily integration of ICT in schools stimulates the development of critical thinking, creative and cooperative learning, since it provides new and more possibilities to perform interactive activities. Consequently, teachers' perception of technology based activities is crucial in the whole cycle of teaching and learning. Thus this quantitative research presents the perception by the teachers' enrolled in the PARFOR, at the Federal University of Tocantins, of the usage of ICT in public schools in the State of Tocantins, Brazil

Keywords: teachers' perception, information technology management, strategic management policy

1. Introduction

Learning using Information and Communication Technologies (ICT) has induced cultural changes in the paradigms of school systems [1]. Teachers have assumed new roles, and for that in the current scenario, qualified support in the application of ICT is necessary [2]. Hence, the essentiality of training teachers in the efficient usage of ICT is established [3].

The necessity of teachers' training has motivated numerous debates in the Brazilian educational scenario that has mobilized several public agents unleashing educational policies. In these debates it has become clear that training and professional development are inseparable in the Brazilian context [4], which is part of the Brazilian Law of Guidelines and Foundations for the National Education (*Leis de Diretrizes e Bases para a Educação Nacional – LDB*) [5].

The National Plan for the Formation of Teachers of Basic Education (PARFOR) [6] is a program implemented under collaboration among the Higher Education Personnel Improvement Coordination (CAPES), State and City Governments, and Universities. It aims to encourage and induce the provision of quality higher education to teachers acting in public schools, for these professionals may obtain the required training established by the LDB [6].

Regarding the use of ICT, Gray *et al.* in [7] has shown that teachers who receive supervision in the usage of technology tend to integrate them more often in their daily activities. Consequently, the daily integration of ICT in schools stimulates the development of critical thinking, creative and cooperative learning, since it provides new and more possibilities to perform interactive activities. However, more than a half of the 3,000 (three thousand) teachers surveyed in Gray *et al.* [7] research reported that their use of ICT is predominantly

⁺ Corresponding author. Tel.: +63-3215-1136
E-mail address: iaranubia.felix@hotmail.com

for administrative purposes rather than educational means. Similarly, the studies presented in [8] and [9] show that the use of technology is more often for non-instructional tasks, such as communication with colleagues.

Educational Informatics may be understood as the use of computers in education, *i.e.*, it is the field that has as object of study human education and development supported by ICT aiming individual and social reflection through school practices. From this perspective, the use of the computer only works effectively as a tool in the teaching-learning process, if it is inserted in a context of activities that challenge the group in their growth. The computer is a tool that may help the teacher to promote students' learning, autonomy and creativity, but for this to happen, it is necessary that the teacher takes on the role of mediator of the interaction among students, knowledge and computer [10].

As a consequence, teachers' perception of technology based activities is crucial in the whole cycle of teaching and learning. Thus this study presents the perception by the teachers' enrolled in the PARFOR, at the Federal University of Tocantins (UFT – *Universidade Federal do Tocantins*), of the usage of ICT in public schools in the State of Tocantins, Brazil.

The authors organized this paper in accordance to the IMRAD structure: introduction, methods, results and discussion; which is adopted as part of the Uniform Requirements for Manuscripts Submitted to Biomedical Journals of the International Committee of Medical Journals Editors, 2008 update. The authors believe that adopting this structure would help search engines in international databases to store and to retrieve information within research papers in order to facilitate meta-analyses and systematic reviews.

2. Methods

This research process takes three steps, namely: (1) exploratory phase; (2) field research; (3) treatment and analysis of the collected data [11]. In this quantitative research, interviews were performed using the structured questionnaires from [12]. The MS-Excel Software was used to perform statistical analysis and to plot graphics.

The complete scenario should be to evaluate the entire universe of all the acting teachers' at the public schools in the State of Tocantins. But, the actual universe of this research was the PARFOR students at UFT of the courses of: education, informatics education, mathematics education, and arts education. All PARFOR students were invited to participate in this study 550 (five hundred and fifty), from which 77 (Seventy-seven) 14% voluntarily answered the questionnaire: 9 of the course of education; 36 of informatics education; 23 of mathematics education; and 9 of arts education.

3. Results

3.1. Profile of respondents

Respondents are public school teachers of the State of Tocantins. Most participants of the survey are 60% women, and 40% men. Fig. 1 illustrates the teachers' highest degree of education: 17% of respondents have a specialization course; 60% have higher education degree; 21% have a high school degree only (this was possible according to the previous Law of Education); and 2% represents other cases (again it was possible according to the previous Law of Education where special cases were recognized).

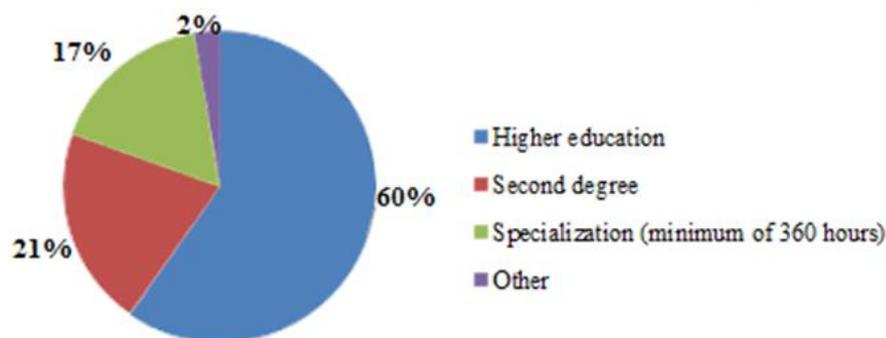


Fig. 1: Education degree

The teachers' experience was also evaluated, most of the teachers have between 6 to 10 years of experience (31%) and the second largest part consists of those who are starting their career in education (up to 5 years – 23%), as shown in Fig. 2.

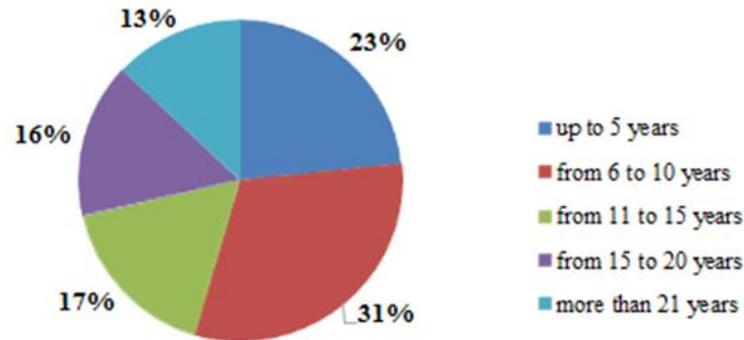


Fig. 2: Year of experience as a teacher.

Fig. 3 illustrates the usage frequency of ICT, basically the computer and the Internet.

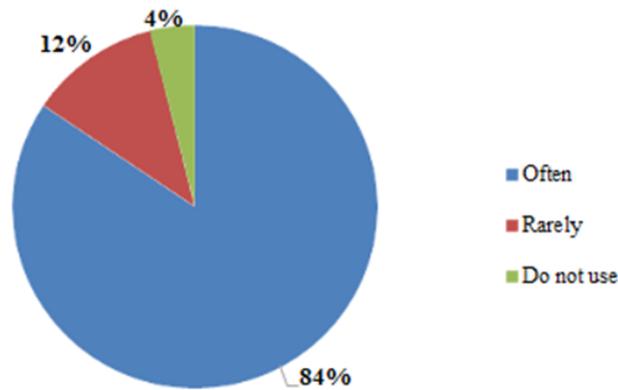


Fig. 3: The usage frequency of ICT.

3.2. Perception on ICT usage

Fig. 4 illustrates the perception of activities performed on the computer in relation to the degree of difficulty in accomplishing certain tasks on the computer, *i.e.* regarding some activities teachers perform such as: file manager, text editor, presentation editor, spreadsheet editor, audio and video editor; and the levels of usage are: great difficulty, difficulty, little difficulty, no difficulty or never held this activity.

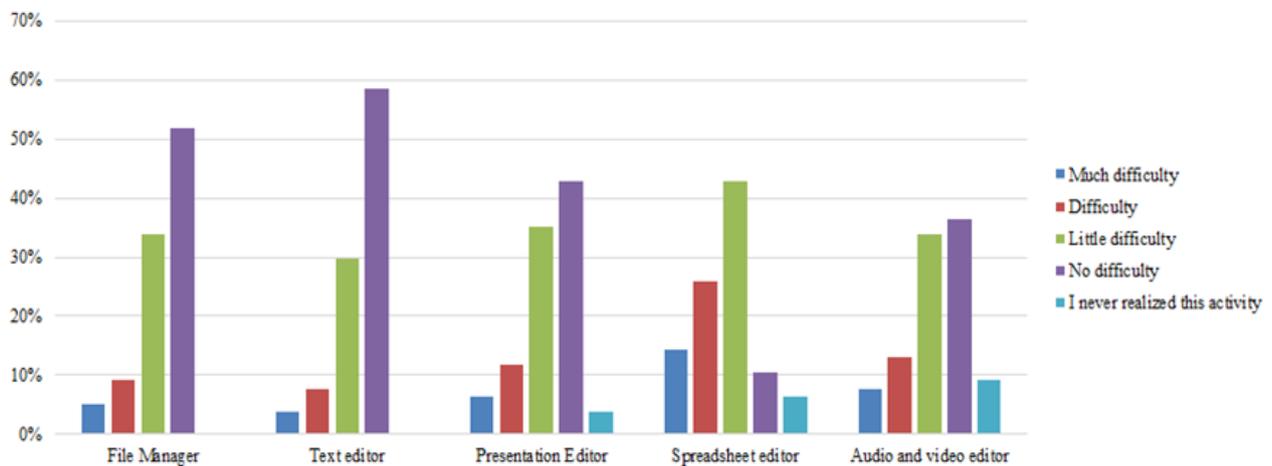


Fig. 4: Perception on activities carried out on the computer.

It is observed that 58% of respondents did not have any difficulty in using a text editor and only 4% still have much difficulty. In addition, 43% have no difficulty when you need to prepare a presentation. Of the activities questioned in all response groups, the percentage of those who never held this activity is low and in some cases is even zero, as file managers and text editors.

In Fig. 5 is presented the perception on activities performed on the Internet in relation to the degree of difficulty in accomplishing certain tasks on the Internet: to search information, to send an e-mail, to participate in an online forum, to create blogs, to post videos, to perform a phone call over the Internet, to download software, to purchase goods or services in the Internet, to be part of e-learning courses.

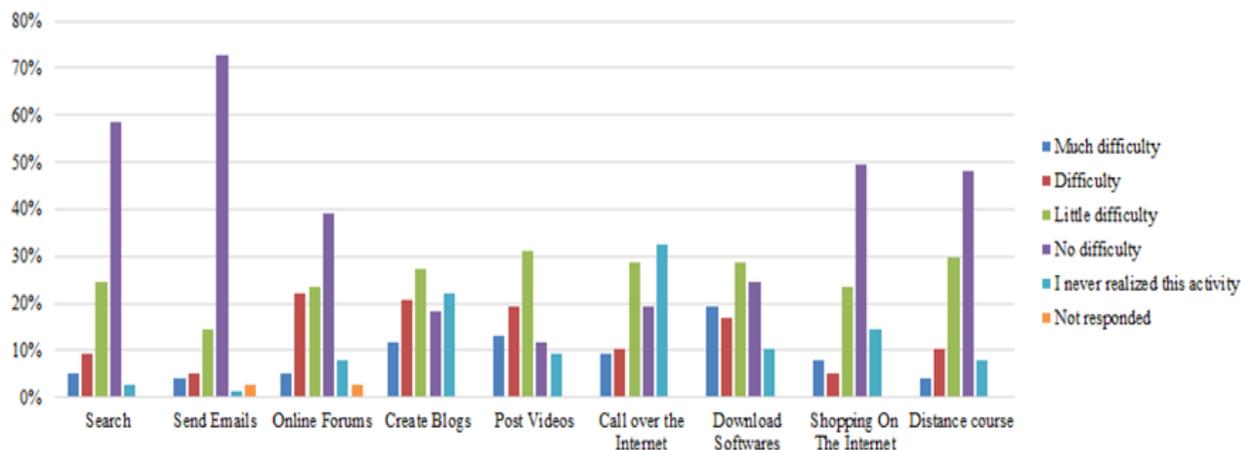


Fig. 5: Perception of the activities carried out on the Internet.

Of the elements surveyed, stand out as those which offer less difficulties for the respondents is sending e-mails and doing internet search. However, tasks as create blogs and post videos presented a predominant result of little difficulty.

3.3. Perception on possible obstacles

The Fig. 6 illustrates the assessment about the possible obstacles in the methodological aspects as the level of concordance of the teacher about the questions, that is, to fully disagree, partly disagree, not disagree nor disagree, partly agree, fully agree, don't know and this school does not occur. The first issue is about if students are more ready to use ICT than teachers, and only 16% of teachers consider that students have more computer knowledge than teachers. The second matter is if the usage of ICT causes a loss of contact with reality, 10% of teachers fully agree while 25% fully disagree. The third issue is to evaluate the traditional methods, that is, if the traditional method is better than the ICT based methods, 6,49% fully agree, 38,96% partly agree, while 12,99% fully disagree and 25,97 partly disagree. The fourth question is about innovation in pedagogical aspects such as disciplines' curricula, the perception of the lack of innovation is clear due to almost 40% partly agree with the statement of lack of innovation. The last issue is about the importance of computer usage, if it is unimportant to use the computer, over 50% answered that they fully disagree and over 10% partly disagree, but it is worth noticing that almost 20% partly agree and less than 10% fully agree.

The perception of the lack of support related to pedagogical and technical issues are presented in Fig. 7. The questionnaire evaluates how disruptive is these lack of support regarding the teaching and learning process. Hence, 86% of the teachers answered that the absence of support somehow disrupted the development of the ICT education activities, and 88% answered that the lack of pedagogical support disrupts ICT education activities.

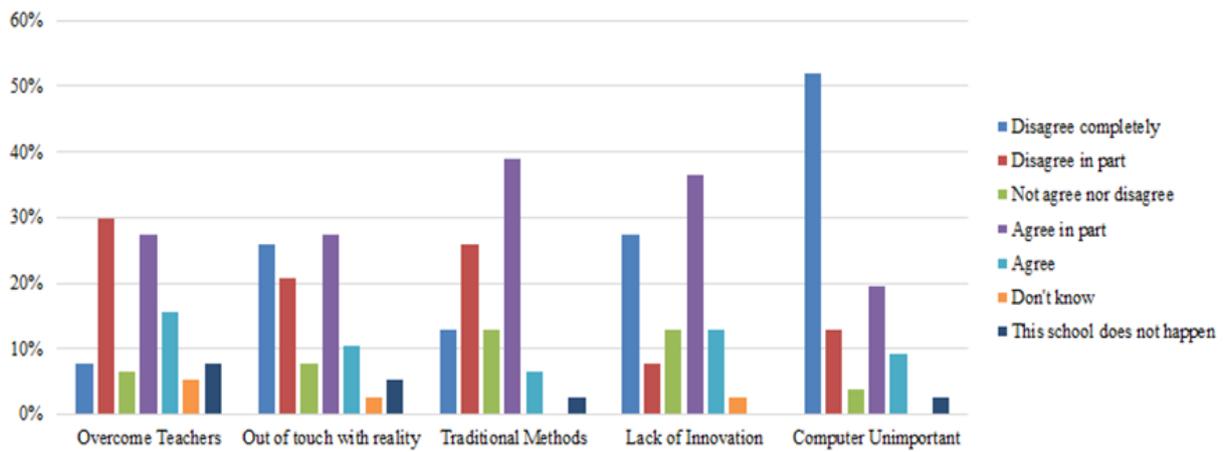


Fig. 6: Perception of methodological aspects

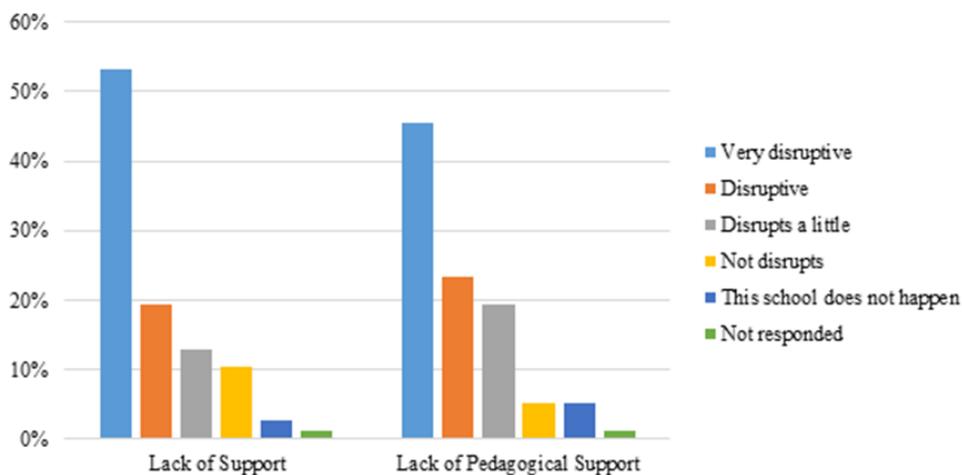


Fig. 7: Perception about pedagogical and technical support

4. Discussion and Conclusion

In this study on teachers' perception of ICT usage, over 60% of the teachers claimed to have little difficulty or none in carrying out activities ICT related. For the State of Tocantins that may sound a very good result considering the Brazilian State national rank of residence Internet access, where the State of Tocantins ranks 23/27 having 17% of residences with access to the Internet [14].

However, the survey was performed among PARFOR students. That means they attend the Federal University of Tocantins aiming a better qualification as teachers, or that they are constantly exposed to ICT at the University and that they are receiving ICT and pedagogical support at the University. That statement is supported by their report of 84% frequently using ICT while 86% and 88% observes the lack of technical and pedagogical support at work, *i.e.* at school.

The questionnaire was developed by the Brazilian Federal Government to evaluate the use of ICT in education [12], but the results extracted from PARFOR students highlight that further analysis is required to obtain a precise scenario. In other words, more questions and more precise questions should be employed to picture the scenario of ICT usage in education. For instance, it is not clear the comparison between traditional methods and ICT methods in education. There may exist a correlation between the difficulty of usage and such comparison that must be investigated. A hint would be that even among PARFOR students their usage of ICT tools related to pedagogical activities is low, such as creating blogs and posting videos.

It is worth mentioning that teachers can get stressed when using ICT in the classroom because of the discrepancy between their knowledge on the use of ICT and the environment ICT available at school [13]. For PARFOR students that is the case in the State of Tocantins. While the Federal Government is investing in their qualification to improve the quality of education in Brazil, the discrepancy happens due to lack of

investment in ICT. The lack of investment is perceptible due to the lack of support at work, both technical and pedagogical, respectively 86% and 88%.

The ICT has a great importance in education for the Brazilian Federal Government as expressed in [12]. This perception is shared by PARFOR students at UFT, who by the way are acting teachers in the State of Tocantins. This perception is exposed when evaluating the unimportance of computer usage in education. That statement is widely rejected by them, over 50% of fully disagree and almost 20% partly disagree, but astonishingly almost 20% partly agree with it. That requires further investigation. A hypothesis would be that students in the beginning of their PARFOR qualification do not realize the importance of ICT in education due to their low exposition to it.

Finally, this work's importance resides in the support that it provides to educators and public agents in the State of Tocantins to guide educational policies. An indirect result of PARFOR must be highlighted, that though it is not the program's objective to provide an ICT qualification, there has been in the context of UFT a natural PARFOR students' training in the usage of ICT. Now is up to the public education managers to provide an environment in accordance to their qualification, and hence, avoiding additional stress to teachers.

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Iara Nubia Fêix de Sousa was born in Guaraí Tocantins State, Brazil in 1983. Completed the Bachelor of Tourism in 2007 at the Institute of Education and Research Objective (IEPO – “Instituto de Ensino e Pesquisa Objetivo”) in Palmas - Brazil. In 2014 concludes the Course Postgraduate Latu Sensu in public health with emphasis in public health and family at the Institute of Higher Education and Research Tocantinense (ITOP - “Instituto Tocantinense de Educação Superior e Pesquisa). In 2015 concluded the course of pedagogy from the Federal University of Tocantins (UFT – “Universidade Federal do Tocantins”) in Palmas – Brazil. Currently works in the Government of the State of Tocantins in the Ministry of Agriculture and Livestock.



Gentil Veloso is a graduated in Data Processing Technology from Universidade do Tocantins (UFT – “Universidade Federal do Tocantins”) and master degree in Computer Science from Federal University of Santa Catarina (UFSC – “Universidade Federal de Santa Catarina”). Is currently professor of UFT and is coursing a doctorate in Engineering Computing and Systems (PESC – “Programa de Engenharia de Sistemas e Computação”), and is President of the Metropolitan Network of Palmas.



Francisca Maria da Silva Costa graduated in Pedagogy from the Federal University of Maranhão (UFM – “Universidade Federal do Maranhão”). Master's degree in education from the Catholic University of Brasília (UCB – “Universidade Católica de Brasília”). Currently studying a doctorate from the Pontifical Catholic University of Goiás (PUC-GO – “Pontifícia Universidade Católica de Goiás”). Is a professor at the University of Tocantins (UFT – “Universidade Federal do Tocantins”).



Jos é Itamar Mendes de Souza Júnior is graduated in Computer Science from (UFT – “Universidade Federal do Tocantins”), currently is a student of the Graduate Program of Systems’ Computational Modeling at Federal University of Tocantins (UFT – “Universidade Federal do Tocantins”), medalist in the Brazilian Mathematical Olympiad public schools (OBMEP – “Olimpíada Brasileira de Matemática das Escolas Públicas”) and Member of the Software Development Nucleus (NDS – “Núcleo de Desenvolvimento de Software”).