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Use of Digital Technologies in Secondary Schools in the City of Nampula - Mozambique

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Abstract: The article addresses an exploratory study that took place in May and June of 2017 in the fourteen public secondary schools in Nampula city, north of Mozambique. The study aimed to understand how digital technologies as a whole are used in the teaching and learning process of Nampula city secondary schools. In order to collect data in schools, it was used on-site observation and interviewed fifteen ICT teachers from the respective schools. In order to understand and validate the data, it was used the confrontation of the curricular objectives of the ICT discipline with the data collected in the schools, regarding not only the modality of teaching of the ICT discipline but also about the good practices of the teachers in what is refers to the use of educational software / learning objects in the teaching and learning process of other disciplines. The results indicate that despite the efforts of the Ministry of Education and Human Development to equip secondary schools with computers, interactive whiteboards and the Internet; 12 of 14 schools theoretically teach ICT for lack of computers, and there are even schools that do not teach the discipline. Therefore, the scenario is two groups of students who complete high public school with different amounts of subjects and without any practical knowledge of ICT that compromises the curricular objectives and consequently the quality of the graduated student.

Keywords: *Digital* technologies; Educational software; Learning objects; Teaching quality; Teaching and learning process

Introduction

We are currently living in the digital age where there is a massive use of digital technologies. The education sector is one of the many areas of work that digital technologies have used in their activities. However, the debate on the impact of using digital technologies in the teaching and learning process is still inconclusive, and there are two opposing currents that debate the success of the use of digital technologies in the teaching and learning process. In 2008, with the objective of offering high school students a vocational tool, the Mozambican Ministry of Education introduces, through a curricular reform, the discipline of Information and Communication Technologies (ICT) in general secondary schools. Secondary schools now have ICT equipment (computers, data show, interactive whiteboards) and internet signal. According to the Mozambique government portal (2017), Mozambique is developing the component of science and technological innovation through the National Network for Research in Education (MoRoNet), a project that aim to implement the ICT policy. It is a nationwide data network that links academic institutions of higher education, technical-professional and research and serves as a platform for the rapid and effective exchange of teaching and research data. MoRoNet leverages and uses the fiber-optic infrastructure already deployed in the country to

ensure quality services to public and private academic institutions and non-profit research centers.

Aware of the existence of different modalities for the use of digital technologies in the teaching and learning process, this study seeks to answer the following question: how digital technologies are used to improve the teaching and learning process in Nampula City Secondary Schools? Thus the general objective of this study was to understand how digital technologies (as a whole) are used in the teaching and learning process of the secondary schools of the city of Nampula; and has as specific objectives to identify modalities of use of digital technologies in the teaching and learning process of secondary schools in the city of Nampula; and Check the state of conservation of the computer equipment used in the teaching and learning process of the secondary schools of the city of Nampula.

In addition to identifying the different modalities of use of digital technologies in schools, good practices of teachers regarding the use of digital technologies in the teaching and learning process also sought to identify evidence and indicators of how the ICT discipline has been implemented in the teaching and learning process of secondary schools in the city of Nampula. The study was developed in 14 (fourteen) secondary (public) schools in the city of Nampula, northern Mozambique. Therefore, in this study we did not address the use of digital technologies in the teaching and learning process of the private sector.

This article is structured as follows: first the literature review is presented, followed by the work related to the study. The third chapter is the methodology, the fourth is analysis and discussion of the results finalizing with the conclusions and recommendations of the study. Finally, the bibliographic review is presented.

Learning Object

According to Tarouco et al. (2014), Learning Object concept (LO) is neither easy nor consensual. Its definition arises according to its own conception about the usefulness and importance of the Object for teaching and learning and varies according to the proposed approach and the aspects that are associated with its educational use. For Wiley (2000), the notion of learning objects is confused in part because there are dozens of definitions of the term learning object (LO) as well as several phrases referring to the same notion of reusable digital educational resources. Wiley (2000) states that learning objects are elements of a new type of computer-based instruction based on the object-oriented paradigm of computer science. However, when it comes to searching for the concept of Learning Objects (LOs) many authors conceptualize the learning object as "... any entity, digital or non-digital, that can be used, reused or referenced during technology-supported learning" (Ying & Qunli, 2011).

Wiley (2000) explains that technology-supported learning includes computer-based training systems, interactive learning environments, intelligent computer-aided instruction systems, distance learning systems, and collaborative learning environments. Examples of Learning Objects (LOs) include multimedia content, instructional content, learning objectives, software tools and software instruction, and people, organizations, or events referenced during technology-supported learning (Wiley, 2000).

Thus, the LOs include all multimedia material directed to the teaching and learning process that use technology as support. Behar (2009) understands by Learning Object any digital material, such as texts, animation, videos, images, applications, Web pages, in isolation or in combination, for educational purposes. These are autonomous resources, which can be used as modules of a given content or as a complete content. They are intended for learning situations in the distance or semi-presential or face-to-face mode. Behar (2009) states that one of the characteristics of this feature is reusability, that is, the possibility of being incorporated into multiple applications. The same object can have different uses, its contents can be restructured or re-aggregated, and still have an interface modified to be adapted to other modules. For Tarouco et al. (2014), the choice of LO that will be used in class presents the intentionality of the teacher in relation to the student's involvement in the pedagogical activity previously stipulated, and the success of its use is evidenced when significant learning occurs, which shows the importance the role of the teacher in the selection of this resource.

In this study, the concept we will be applying to LO is that referred to by Behar (2009). LOs can be created in any media or format, as simple as an animation or slide show, or complex as a simulation. Typically, they are created in modules that can be reused in different contexts (Tarouco et al., 2014). In this study a digital multimedia book was created using the Web tool EdiLim, with the purpose of teaching the contents of the maths discipline of 7th grade in a primary school in Mozambique.

Related Work

When we talk about the influence of computers in the teaching and learning process there is a debate that is still very open and inconclusive. Cuban (1993) argued that the effectiveness of computer use in the classroom is often doomed to failure because teachers are reluctant to use technology. Clark (1994) states that media are merely vehicles that offer instruction, but they do not influence the achievement of the student more than the truck that delivers our groceries, causing changes in our nutrition. Here it can be seen that the author does not verify the media as great cause of changes or development of learning, but rather as mere conveyors of information for the process of instruction. Next, Clark (1994) argues that this is not a fact that media can influence learning, as we can see when it states that media not only fail to influence learning, they also are not directly responsible for motivating learning.

Nusir, Alsmadi, Al-Kabi, & Sharadgah (2012) developed a study to investigate the impact of the use of multimedia technologies in improving or not improving the teaching effectiveness of students in early stages in primary schools in Jordan. Two groups were selected at a local school. The experimental group was taught the subject of basic mathematics using a program developed for this purpose. The second class (control group) was taught the same subject using traditional teaching methods. The results showed that the use of multimedia-enhanced teaching programs or methods can be effective in alerting students, especially when cartoon characters are used. The results also showed that there is no significant difference in learning and knowledge skills and absorption of information based on gender

distribution, where the comparison of results between boys and girls did not show significant difference in their learning abilities.

Results of meta-analyzes of experimental studies in which educational software was used to learn operations with fractions, decimals and percentages; plane and coordinate geometry; indexes, rates and proportions; operations with real and integer numbers; probability and data analysis; and measurement do not present significant statistical differences (Dynarski et al., 2007). On the other hand, when educational software is applied to the learning of algebra in schools, it is verified that the study time used in the educational software does not present a statistically significant correlation with a positive impact on student learning (Dynarski et al., 2007).

Hogrebe and Tate (2012) found that the individual socioeconomic status of poor communities is significantly related to students' performance in algebra, with students from low-income communities reaching lower levels than students from rich communities. Kitchen and Berk (2016) argued that computer-assisted instruction can focus only on basic skills for low-income students and minorities, further limiting their opportunities to learn mathematical reasoning. Here it is verified that the poverty of the societies is one of the factors that contributes to the poor performance of the students when submitted to a process of teaching and learning coupled with educational software.

According to the BBC article (Coughlan, 2015), entitled Computers' do not improve pupil results, says OECD, published on 15 September 2015, it concludes that even when computers are used in the classroom, their impact on student performance is mixed, in best of all. Students who use computers moderately at school tend to have slightly better learning outcomes than students who rarely use computers. But students who use computers too often at school get worse learning outcomes. According to the same article, the results also do not show significant improvements in students' performance in reading, math or science in countries that have invested heavily in Information and Communication Technologies (ICT) for education. And perhaps the most disappointing finding is that technology seems to be of little help in overcoming the skills divided between favored and disadvantaged students.

For Kozma (1994) educational technology is a design science and not a natural science. The phenomenon we are studying are products of our own devices and conceptions. Kozma (1994) states that if there is no relationship between media and learning it may be because we have not yet developed the appropriate media. If we do not understand the potential relationship between media and learning, it is very likely that media with this relationship will not be developed. And finally, if in our theory and research we exclude considerations of a relationship between media and learning conceptualizing the media as mere vehicles, we are likely never to understand the potential of this relationship. Kozma (1994) states that in order to establish a relationship between media and learning we must first understand why we have not been able to establish a relationship between media and learning for so long. To a great extent, the cause of these failures is due to the fact that our theories, researches and design were constrained by vestiges of the behavioral roots from where our disciplines arose.

Studies presented by many authors (Foster, Anthony, Clements, & Sarama, 2016; Moradmand, Datta, & Oakley, 2014; Zaranis, 2013; Zaldívar-Colado, Alvarado-Vázquez, & Rubio-Patrón, 2017) has confirmed that Information and Communication Technologies (ICT) help to improve math learning. Zaranis (2013) has developed a study to investigate whether Information and Communication Technologies (ICT) help improve the knowledge of rectangle geometry in a primary school. The applied educational software was composed of a history and various activities with and without the use of computers that were drawn following the antecedents of teaching mathematics realistic for concepts of geometry. In addition, it used a mathematical test called "Primary Shape Test" (PST) to explore the use of ICT in teaching basic geometric concepts of primary education. The results of the study indicated that teaching and learning through ICT is an interactive process for children in elementary school and has a positive effect on the formation of rectangle geometry.

Moradmand, Datta, and Oakley (2014) say that there is often a disconnect between theory for the design of educational applications and theory regarding the application of technology in classrooms, as well as the lack of alignment between technology, curriculum and pedagogy. Thus, in many cases, obtaining computer-based technology and applications to facilitate learning in a pedagogically acceptable way for teachers have become a challenging area for schools. They developed a study that aimed to design and develop computer-based multimedia applications, based on a strong educational structure. To demonstrate the value of tools in facilitating math teaching and learning, the tools were offered to five different primary schools in Western Australia, of which three public schools, one private and one special in areas with different social and economic classes. The results indicate that teachers were able to define and establish certain mathematical learning and teaching objectives that aligned with the Australian curriculum and to use the multimedia application as a teaching tool to teach the planned objectives. In addition, the application offered teachers multiple opportunities to model, share, and discuss a series of mathematical concepts within a story, in a multimodal fashion, and helped them to express various math concepts for children in an engaging and faster and deeper way than in the traditional way. The findings also reveal that software has helped to engage students' curiosity about mathematics, engaging them in the learning process, interacting with content, keeping them on task, eliciting sustained and useful classroom interaction, and to enable and enhance the learning of subject content individually and in pairs or small groups.

For Zaldívar-Colado, Alvarado-Vázquez, & Rubio-Patrón (2017) the use of educational software offers many advantages, but it can also become a frustrating experience for teachers and students who do not have experience of use. The authors present an evaluation of the use of educational software in mathematics to support the learning of first year primary students in the city of Mazatlán, Mexico. The aim of the study was to examine the impact of software (sacar10) and introduce educational software to a first-year class of students. The study was carried out in three schools located in the urban area of the city of Mazatlan, Mexico. The results indicate that the views on effective computer-based pedagogy are related to the types of software teachers used with their students.

Regarding the results obtained in the study, software (sacar10) supported and improved the learning of mathematics in general. This conclusion was obtained from the research responses, from the perspective of the teacher and from the perspective of the student. Overall, the study suggests from the surveys that the use of math educational software has a positive impact on student learning.

Foster, Anthony, Clements, and Sarama (2016) present a study that evaluated the effects of a mathematical software program - The Building Blocks Mathematics Program - on the mathematical performance of young children. 247 Kindergartens from 37 classrooms participated in 9 schools located in low-income communities. Children in classrooms were randomly assigned to receive 21 weeks of computer-assisted instruction (CAI) in math with The Building Blocks Mathematics Program software. The results indicate that children who used The Building Blocks Mathematics Program showed higher post-test scores in numeracy tests and Applied Problems after checking for year-numbering score.

Given these conflicting concerns and results discussed above, it is important to examine the effectiveness of digital technologies to improve learning.

ICT and Leaning quality in Mozambique Secondary Schools

In Mozambique, the program of the Information and Communication Technologies of the 10th class provides that at the end of the 1st cycle students will acquire ICT use skills not only for scientific purposes but also for the solution of political, community and social problems. The Information and Communication Technologies Education Program of 11th and 12th grades is more geared towards the vocational side. These programs focus on the introduction of vocational tools such as Operating Systems; Creation of Web pages; Data base; Programming; etc., so as to allow the student who finishes the 12th grade to fall into the job market or to provide for self-employment based on the skills acquired in both the 1st cycle and the 2nd cycle of General Secondary Education.

In this article we focus on understanding the different modalities of using digital technologies as a whole, in the ICT discipline as well as in other disciplines, and then assess the contribution of these tools in improving the quality of teaching. Although the concept of teaching quality is intangible and subjective, we focus on delineating the quality of teaching based on the objectives and competencies previously conceived in the curricula. In this way, quality of teaching is understood as being the aptitude for the purpose for which the student is formed (Harvey & Green, 1993). Here it is suggested that quality has meaning only in relation to the purpose of the product or service. Thus, quality is assessed in terms of the extent to which the product (student) fits its purpose (expected competencies that the student develops at the end of the cycle). This notion is quite distant from the idea of quality as something special, distinctive, elitist, conferring status or difficult to achieve. It is a functional definition of quality and not an exceptional one.

In this way, quality teaching should result in learning in which the student is free of what it ignores transforming himself and the space that surrounds him with evidences that go beyond the physical and cognitive. This transformation of the individual must

involve - in addition to knowing how to be, being and living with other people - changes that allow the development and continuous evolution of society at different levels and areas of knowledge. If the student develops the competencies previously outlined then the process of teaching and learning it has quality, and consequently the student is well formed.

Methodology

Participants

The present study was conducted in the fourteen secondary (public) schools in the city of Nampula. An exploratory study is held to understand the different modalities of the use of digital technologies in the teaching and learning process of secondary schools in the city of Nampula. In total, 15 teachers who taught ICT in secondary schools in the city of Nampula were surveyed. Of the fifteen teachers surveyed, thirteen were male and two females. On average the Nampula city secondary schools have two teachers of the ICT discipline - one in the I cycle and another II cycle of general secondary education.

Since we were looking for information regarding the use of digital technologies (in their entirety) in the teaching and learning process, we had as selection criteria those teachers who work in the second cycle because in addition to being ICT teachers are also computer technicians of the school. In this sense, the ICT teachers of the II cycle are aware of all the digital tools that are being used in schools since in addition to maintaining the computer equipment of the schools, they also provide assistance to colleagues from different disciplines when they intend to use digital technologies in the process of teaching and learning.

Instruments

To collect data, a questionnaire interview was conducted with teachers or coordinators of the ICT discipline of the respective schools. In total, fifteen teachers of the ICT discipline were surveyed. In addition to writing down the respondents' response, an android voice recorder application was also used. Here it is important to note that two of the fifteen teachers interviewed denied recording the interviews, so the reports of these two teachers were recorded on paper.

On the other hand, it was used the observation in loco of the scene of the computer rooms as well as the attendance of the classes of ICT The questionnaire included open and closed questions. The open questions were intended to collect unanticipated data and information that respondents thought was important for the study. Thus, the open questions focused on the identification of different modalities of use of digital technologies, as a whole, in the teaching and learning process of all disciplines. Here we did not take into account only the teaching modalities of the ICT discipline, but rather the use of digital technologies in the learning of contents or subjects of all curricular subjects. The interviews had on average thirty minutes of interaction with teachers.

Closed questions were aimed to verify whether schools had computers (yes / no), whether using educational software / learning object, and if they use tablet, smartphone in the learning and teaching process. Of the fourteen (public) high schools of Nampula city only at Nampula Secondary School (the biggest school of all) two ICT teachers were interviewed.

In order to have access to the secondary schools of the city of Nampula it was necessary to request the provincial direction of education and human development of the province of Nampula. Once the authorization and the list of all the secondary (public) schools of the city of Nampula were obtained it was passed to the phase of the visits and interviews in the schools.

Data analysis

To validate the data, a description of the interviews and the facts observed in the respective schools was used. To maintain the anonymity of the interviewed teachers, their names were catalogued according to the order (1, 2, 3... 15) of interviews and were named by P. In this sense, the first teacher who was interviewed received the designation P1, the second, P2, the third, P3, and so on; and the interview script contained 7 questions.

The first question: does the school have computers for the teaching and learning process? In this question it was hoped to obtain dichotomous answers YES or NO. However, these were not always the answers obtained, there were times that the respondents answered, for example, we already had.

The second question of the interview script was: do the school teachers use digital educational games in the teaching and learning process? The aim of this question was to verify whether secondary school teachers explore the potential of digital games to facilitate their students' learning (gamification). In this question, it was expected to obtain the YES or NO response. If the answer was positive, it was asked to Table 1.

indicate the name of the game, the discipline in which it is used and how it is used.

The third issue of the script was: do teachers use any educational software / learning object? In this question, it was expected to get the answer YES or NO. If the answer was positive, it was asked to indicate the name of the game, the discipline in which it is used and how it is used.

The fourth question was: do teachers use smartphones, tablets or any other digital device in the teaching and learning process? In this question, it was expected to get the answer YES or NO. If the answer was positive, it was asked to indicate the type of digital device, the discipline in which it is used and how it is used.

The fifth issue of the script was: are teachers interested in using digital technologies in the teaching and learning process? In this question, it was expected to get the answer YES or NO. Here, regardless of the answer given, it was asked to be justified (why?).
The sixth question was: how do you teach ICT? In this question we sought to verify how the curricular objectives (the teaching of the ICT discipline) were being achieved.

The last part of the questionnaire was intended to explore, to hear from the interviewees something they liked to report, to comment on the study in question. So, the seventh one was: do you want to share some information related to your experience of using ICT in the teaching and learning process?
Given the questions (Q) above, the responses in Table 1 were obtained:

Q1: Does the School Have Computers for the Teaching and Learning Process?

Teacher (P)	Answer
P2, P3, P4, P5, P6, P7, P11	NO
P9, P15	YES
P1	We had, they were stolen.
P8	We do not have electricity, so we do not have computers
P10	Robbed at dead of night
P12	We had a well-equipped room but the computers got spoiled
P13	Currently we do not have any computer room.
P14	We have two computers that give us a way in the ICT discipline

Table 2.

Q2: Do School Teachers Use Digital Educational Games in the Teaching and Learning Process?

Teacher (P)	Answer
P1,P2,P3,P4,P5,P6,P7,P8,P9,P10,P11,P12,P13,P15	NO
P14	YES
	the game of checkers and labyrinths are used in the ICT discipline to help students think fast

Table 3.

Q3: Do Teachers Use Any Educational Software / Learning Object?

Teacher (P)	**Answer**
P1,P2,P3,P4,P5,P6,P8,P9,P10,P11,P13,P14,P15	NO
P7	YES Geogebra software is used to understand the matter related to Geometry and statistics.
P12	YES Winplot educational software is used in the teaching and learning process of the mathematics discipline

Table 4.

Q4: Do Teachers Use Smartphones, Tablets or Any Other Digital Device in the Teaching and Learning Process?

Teacher (P)	**Answer**
P1,P2,P3,P4,P5,P6,P7,P8,P9,P10,P11,P12,P13,P14,P15	YES teachers use smartphones, tablets and laptops to search the internet content and teaching methodologies: Google, Wikipedia and Youtube, etc.

Table 5.

Q5: Are Teachers Interested in Using Digital Technologies in the Teaching and Learning Process?

Teacher (P)	Answer
P1,P2,P3,P4,P5,P6,P7,P8,P9,P10,P11,P12,P13,P14,P15	YES Because digital technologies improve the knowledge of teachers and students, they facilitate communication through the internet, they allow to send works by email, you can create a workgroup in Facebook and post questions of certain discipline, PowerPoint classes are more interesting, the students like, can communicate with students via WhatsApp, information inquiries on the internet, because we are in the information age and we must use, help students to master ICT, is an important tool.

Table 6.

Q6: How Do You Teach ICT?

Teacher (P)	Answer
P1	Yes we teach , but only theory
P2	We teach theory, so they get some knowledge of ICT
P3	We have to follow the program, we teach theory
P4	We do not even have a computer room
P5	We only teach theory
P6	We do not have this subject
P7	We use the computer in the teachers' room to show the students the practical part
P8	as I said before, here we do not teach this discipline because we never had electricity
P9	We act in accordance with the curricular plan
P10	I have two laptops I use for students to practice

P11	computers were stolen, so I only teach theory
P12	We give the theoretical part as some students have laptop they use in practice classes and other students practice at home with their parents' computer.
P13	I show the practical part on my laptop.
P14	We have two computers available and I bring two more laptops of mine and form work groups, I do my best for my students to master ICT.
P15	As you can see we have all the conditions so we really teach the ICT suject.

The seventh issue of the study focused on the information teachers liked to share. In summary, teachers call for free access to the internet, want computers in schools, want to get more ICT-related training and believe that digital technologies improve teaching quality.

Results

Despite the efforts of the Ministry of Education and Human Development to equip schools with computer equipment, it can be seen that in 12 of the 14 public secondary schools in Nampula the subject of ICT is taught theoretically because the equipment was vandalized or stolen and never been replaced. This is due to the lack of physical security of the computer rooms, there are cases where the ICT discipline is not included in the range of subjects taught in the school, as can be seen, for example, in the Marcelino dos Santos and Barragem secondary schools.

Digital Technologies Used in Different Disciplines

It was verified that in Nampula Secondary School the educational software Winplot is used in mathematics learning. Already in the Maratane Secondary School teachers of the Mathematics discipline use Geogebra software to understand the Matter related to Geometry and Statistics. It turns out that many teachers turn to the web to research and enrich their range of content and teaching methodologies. Platforms like Google, Wikipedia and Youtube are often referenced as sources of queries from teachers and students. In addition to these platforms, schools also use datashows for the projection of ICT-related content, as well as interactive boards (Netboard), smartphones, and digital games such as checkers and labyrinths.

Teachers Good Practices

Despite the ban on the use of mobile phones in schools, there are some good practices of teachers. One of these good practices is that in spite of the lack of computer equipment, teachers use their own mobile phones and computers for students to visualize and practice the contents under study with teachers bringing two laptops to their practical ICT classes as for example, at Napipine High School. In order to clarify some knowledge related to computer science, such as what is an operating system, what is a motherboard, etc., teachers use the datashows and interactive whiteboards that the schools provide, sometimes having access to the Internet using their

own resources (modem purchase and credit to access the internet).

It is also verified that teachers use their smartphones to consult or present practical examples related to the learning and translation of the national and foreign languages (English and French). In some schools, such as Cossore and Napipine Secondary Schools, teachers send and receive student work via Email and WhatsApp. Given the lack of computer equipment in schools, some teachers encourage students to explore the functionalities of their smartphones for word processing and spreadsheets (Excel). It is also verified that teachers take advantage of students' smartphones as a computational resource to access information on the Web, and also use smartphones as teaching material to exemplify and explain concepts such as hardware, software, operating systems, etc.

Interest of Teachers in Using Digital Technologies

In generally it was found that teachers have an interest to use digital technologies in the teaching and learning process. Teachers recognize the importance of digital technologies and point out that they assist the teaching and learning process because they allow teachers not to stick to what is foreseen in the programs and to explore advances and scientific and technological developments of the subject under study. There is an implicit sense that the constant access to the internet allows the formation, continuous updating of the teachers allowing them to teach updated contents with contemporary examples since there is a shortage of didactic material and the schools do not have a library.

It can be seen that in most schools, teachers who teach ICT are trained in computer science and they feel limited in teaching the content programmed for lack of computers. There is a need to equip schools with datashow since this equipment facilitates the viewing and learning of content related to ICT discipline and other disciplines as well. Internet access in schools is a concern of students and teachers. Teachers crave continuous training related to the use of digital technologies in the teaching and learning process. The table below shows the use of digital technologies in secondary (public) schools in the city of Nampula:

Table 7

Use of Digital Technologies in Secondary Schools in the City of Nampula – Mozambique

Order	Secondary School:	Computers room	Teaches ICT discipline	Use of other digital technologies in the teaching and learning process	Validation of the result of ICT discipline
1.	12 DE OUTUBRO	No	yes	No	Yes
2.	22 DE AGOSTO	No	yes	yes	Yes
3.	ANCHILO	No	yes	No	yes
4.	BARAGEM	No	No	No	No
5.	COSSORE	No	yes	yes	yes
6.	MAPARA	No	No	No	No
7.	MARATANE	No	yes	yes	yes
8.	MARCELINO DOS SANTOS	No	No	No	No
9.	MUATALA	yes	Yes	No	Yes
10.	NAMICOPO	No	Yes	Yes	Yes
11.	NAMPACO	No	Yes	No	Yes
12.	NAMPULA	No	Yes	Yes	Yes
13.	NAPIPINE	No	Yes	Yes	Yes
14.	TEACANE/Natikiri	Yes	Yes	No	Yes

Discussion

At Marcelino dos Santos Secondary School, the ICT discipline is not taught because it never had electricity, while at the Barragem High School, the ICT discipline is not taught because they never received computer equipment for this purpose. This is confirmed in the second volume of the Evaluation Report of the Strategic Plan for Education and Culture 2006-2010 / 11 which states that:

In general education, the teaching of ICT is prescribed by the curriculum in the 10th and 12th grades, but it still experiences many difficulties, since ICT classes are only carried out where there are conditions. In practical terms, in General Secondary Education, the teaching of ICT hardly happens because schools have serious infrastructural problems and often the number of students in school makes one computer room not sufficient for all eligible classes. This situation is compounded by the lack of computer maintenance technicians and networks.

Continuing the same report points out that:

The training of ICT teachers is still not enough, on the one hand, it has no impact, because schools do not have the right conditions to teach ICT. The fact that about 200 educational institutions have at least one computer room does not guarantee the existence of ICT classes for the following reasons: insufficient computers for large numbers of students, lack of or insufficient technicians and lack of funds for maintenance and Internet.

If on the one hand there is recognition of the lack of these equipment in schools, the same cannot be said of the validation of the results of the ICT discipline in the student process. The Ministry of Education recognizes the lack of equipment for the teaching of the ICT discipline, however, it is verified that even without having the computer equipment, the schools teach the subject of ICT in a theoretical way and yet validate in the agenda and in the final use of the student who attended the course even knowing that the contents were not taught in a practical way, as is planned and provided in the curricula programs.

Given the above problems, it is verified that the competences that the students of general secondary education are expected to acquire are not being reached because the scenario is of three groups of students - those who learn effectively, those who learn theoretically and those who do not learn the discipline of ICT – those who complete public high school with amounts of different disciplines and without any practical knowledge of ICT which compromises the curricular objectives and consequently the quality of the graduated student. Therefore, aptitude and the purpose for which students are being trained are not being reached.

On the Quality of Teaching and Learning

One of the objectives of the transformation of general secondary education in Mozambique is to contribute to the improvement of the quality of teaching, providing students with relevant learning and appropriated to the socio-economic context of the country. The Information and Communication Technologies (ICT) program aims to provide students with professional tools related to Information and Communication Technologies. In order to achieve the recommended curricular objectives, it is necessary for schools to have computer equipment (computers, datashow, interactive boards, etc.), internet, technicians and teachers trained in computer science.

This is not so because despite the efforts of the Ministry of Education and Human Development to equip secondary schools with computers, interactive whiteboards and the Internet, only two of the fourteen (public) secondary schools in the city of Nampula have been equipped computer rooms. The remaining twelve do not have computer rooms and cannot afford

the purchase and maintenance of computer equipment. Therefore, we are saying that only two secondary schools in the city of Nampula have the conditions to teach ICT. Despite this situation, some secondary schools teach the discipline in a theoretical way and are unable to reach the objectives set.

Limitations of the Study

In this study, data were collected through on-site observation and questionnaire interviews directed only to teachers of the ICT discipline. Naturally, more detail would be obtained if pupils from schools, other teachers and school principals were interviewed regarding the use of digital technologies in schools. Given the reduced time of data collection it was not possible to attend the ICT classes in all the schools, only in 3 schools it was possible to attend the classes.

Conclusions and Suggestions

This study concludes that the scenario of secondary schools in the city of Nampula is not good, since 12 of the 14 public secondary schools do not have computer equipment. On the other hand, there is no internet in schools and there is little dissemination of educational software / learning objects in schools; and many teachers turn to the web (with their own financial resources) to research and enrich their range of content and teaching methodologies.

It is also verified that platforms such as Google, Wikipedia and YouTube are often referenced as sources of queries of teachers and students and that the lack of internet in schools is an obstacle that contributes to the non-strengthening of teachers' pedagogical practices and that they have awareness of the gains that digital technologies can bring to improve teaching quality.

In addition to a few software / learning objects are used in (public) secondary schools in the city of Nampula, it is also verified that digital technologies are used in a very limited range of subjects (ICT, Mathematics, English); and that schools do not provide adequate and secure infrastructures to house computer equipment (poor infrastructure and school night safety is weak). Another factor that compromises the quality of teaching is the fact that, despite being included in the curricular objectives, students complete high school without the practical knowledge of ICT.

It is suggested that the Ministry of Education and Human Development equip schools with computers, Internet and audio and video equipment; to standardize, in schools, the validation of the ICT subject marks since some schools theoretically teach the subject and validate the results of the subject even though students never have practical ICT lessons; to create ways of making profitable in the teaching and learning process the technological resources that students and teachers have (smartphones, tablets, social networks, etc.); it is also suggested that teachers continue to be trained in digital technologies for the education and the framing of learning objects / educational software in schools through seminars and workshops. Due to the security of the infrastructures must be rethought the physical and logical security model of the infrastructure that houses the computer equipment; and strengthen night-time security, if possible, to directly frame members of the Police of the Republic of Mozambique to secure schools.

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