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ICT Integration Policies in School Curriculum in Angola: A Study in Namibe Secondary School

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Abstract: ***In this article, we sought to understand the impact of public policies for the integration of information and communication technologies in the study plan of secondary education in Angola, conducting an exploratory case study in one of the schools of the province of Namibe, in order to organize and develop ideas for a more comprehensive study. For the development of this research work, data were obtained through questionnaires and interviews as data collection technique. For the respective treatment, the qualitative and descriptive analysis technique were chosen. The results show that the lack of continuous investment in teacher training for the use of ICT in the classroom, as well as the lack of maintenance and regular replacement of technological resources, allied to the lack of a specific project to articulate ICT and pedagogy in the school studied, among other factors, these can be an indicator of the school's affirmation as retrograde to the achievement of the objectives in relation to the new professional training model that is intended within the ICT policy implementation strategies outlined in the study plans.***

Keywords: Public policy, ICT, High school of the Second Cycle, Angola

1. Introduction

The growing interest in the potential of information and communication technologies (ICT) in the social sphere is today an undisputed reality. In the field of education, investment in ICT was considered so pertinent that the member states of the World Forum for Education for All (2000) included this investment in their commitments as one of the objectives for achieving effective participation in 21st century economic societies. In this regard, Angola, being a member country, is not on the sidelines of this commitment. Accordingly, and in order to adapt education to contemporary requirements, the Angolan government, within the framework of the current reform and in line with the National Education for All Plan (2001-2015), has made efforts to improve the study plans, the widening of training areas, teacher training, rehabilitation, construction and extension of the school network. Measures also include the integration of ICTs into Secondary School (II CES) curricula through the computer science subject and the establishment of middle courses in this area, in order to provide trainees with knowledge and technical skills that enable them to use the computer and other technological resources in the exercise of their professional activities.

However, after more than a decade, we believe that it is pertinent to develop and deepen the knowledge on this specific subject, due to the fact that there is still insufficient production of scientific studies aimed at analyzing and understanding the impact of public policies on the integration of ICT in education in Angola.

Positioned in the administration and educational policies related to the integration of ICT in Education, the present study sought to fill the above gap and aims to analyze and understand the impact of public policies on ICT integration in the study plan of one of the secondary schools in Namibe province, from the perspective of those responsible for the institution and teachers. For the development of the research work the following starting question was raised: What transformations have emerged from the application of public policies for the integration of ICT in the secondary school under study, to reach the objectives outlined in the curriculum?

2. Study Framework

Assuming that the Angolan education system is based not only on educational policies that safeguard national cultural values and interests, but also in the experiences accumulated and acquired at international level, In other words, in the ideas of institutionalized world culture, we systematize in the following section the guidelines on the integration of ICT emanating from documents produced by supranational bodies. The following is a set of empirical studies aimed at analyzing the impact of ICT integration policies on education, as well as the enhancing factors and related obstacles. In addition to providing answers to the questions that guided the theoretical framework, identifying the most explored methodologies, data collection and processing techniques, the respective studies also served as a basis for outlining the methodological options assumed in the present study that we present in the fourth section. Thus, after the presentation of the methodological design, the section on Treatment, triangulation and synthesis analysis of the results is presented, culminating in the presentation of the conclusions.

2.1 Supranational Policies for ICT Integration in Education

According to the United Nations Children's Fund (UNICEF, 2013), global and national policies regarding the integration of ICT in the education system can provide several important functions. That organization warns that policies do not just become operative, that is, what will happen in the absence of a strategic policy that seeks to provide a set of goals and an insight into the role of ICT in a country's education system. This awakening reinforces the work developed by Kozma (2008) and Berrocoso, Arroyo & Díaz (2009), referred to below. In this perspective, the joint work of the United Nations Educational, Scientific and Cultural Organization and the Organization of Ibero-American States for Education, Science and Culture (UNESCO & OEI, 2014)

stress that regardless of whether or not operative policies represent a window of opportunity for innovation, which aims to strengthen the task of school institutions, does not necessarily mean that the ways of teaching and learning automatically change. In this vein, the OECD (2010) emphasizes that the strategies undertaken to achieve results should be underpinned by a systemic approach to innovation as a guideline that includes at least five basic elements:

- A policy oriented towards supporting educational technology research sustained in a politically national interest and their practices;
- An innovative framework to support different initiatives, including monitoring and evaluation mechanisms to help promote new policy and practice strategies for technology in education;
- An up-to-date knowledge base resulting from both research and evaluation of innovations, including their access links;
- Undertake a systematic set of efforts to synthesize and disseminate new knowledge about policies and practices regarding the use of technology (eg observatories or clearing houses - regulatory agencies, information center) as facilitators of educational innovations in order to challenge status quo of the system, establish new horizons and contribute to gradual change;
- Invest in the construction of infrastructures, as well as in the training and qualification of human resources capable of carrying out the above mentioned goals.

Regarding the construction of technological infrastructures at school level as a means of promoting the use of ICT by teachers and pupils, the Education, Audiovisual and Culture Executive Agency (Eurydice, 2011) recommends that educational institutions have access to appropriate networks, equipment and software and that these resources be available to all students and teachers.

Regarding teacher training for the use of ICT in the teaching and learning process, UNESCO and OEI (2014) report that: a) Firstly, it is important that new skills for the use of ICTs during professional performance are developed in new teachers as well as those who are in full exercise of their duties, in particular in order to enrich pupils' learning and develop the skills needed for the 21st century; and secondly, b) ICT and teacher education must also be linked to the new modes of teacher education that have been developed through the massification of ICT in society.

From the survey summary of the studies on ICT integration policies in Education, it can be inferred that, in relation to research issues and objectives, most sought to analyze the policies governing ICT integration practices in Education and their respective regulations. By way of example, we highlight the works of Kozma (2008); Berrocoso, Arroyo & Diaz (2009); Peeraer (2009); Pons, Bravo & Moreno (2010); Pérez (2011); Barros & Sebastião (2012); Couto & Coelho (2013); Mofarreh (2016) and de Silva (2017) in which the authors seek to present and debate the main lines of educational thinking based on the interpretation of the main norms in force regarding the educational policies of ICT integration in the school. In methodological terms, in most of the studies analyzed the authors choose a qualitative and exploratory approach based on documentary research and interviews as data collection techniques and consequent content analysis for the respective treatment. The works developed by Mofarreh (2016) and Pérez (2011) are exceptions to the others in terms of methodological design, since the authors resorted to mixed research, ie the combination of qualitative and quantitative data analysis techniques to achievement the research objectives.

3. Enabling factors and obstacles affecting public policies for ICT integration in the school Contexto

The integration of ICT in the curricula of school institutions has introduced the need for new policies and, consequently, new requirements in the work culture dynamics of industry professionals. According to Ponte (1994) and Vidal & Neto (2016) the great dilemma is to equate the best strategy in terms of public policies for their effective integration in educational activities. In this perspective, Kozma (2008) and Berrocoso, Arroyo & Díaz (2009) state that the policies in question must be viewed in two ways. The fis tone refers to strategic policies, it establishe a blending of objectives and vision in regard to the use Technologies in educational sistems as well as its benefits. The second is related to the operative policies that deal with the training of teaching staff, construction of infrastructures, acquisition and equipping the school with the technical means.

Robert Kozma adds that national policies (strategic and operational) to integrate the ICT into the educational system will have a meaningful impact if they be aligned with other policies that is, strategic – operational alignment, horizontal and vertical alignment (cf. Kozma, 2008).

Pimentel (2013), in his work on public policies for ICT in Brazil, shares the rhetoric of the aforementioned author and warns that:

“An educational policy aimed at integrating ICT in schools must take into account that technological innovation, if not accompanied by pedagogical innovation and an educational project, will represent a mere superficial change in school resources, but it will not substantially alter the nature of cultural practices in schools ”(p. 98).

Of the strategic measures that have been revealed by the above-mentioned supranational organizations (OECD, 2010; Eurydice, 2011; UNICEF, 2013; UNESCO & OEI 2014), as well as those underlined in the works of the referenced authors, we believe that if implemented in a thoughtful and monitored manner, they can contribute to the good practices of integrating ICT policies in the school context.

Regarding the factors that negatively influence the implementation of educational policies for the integration of ICT in the school context, the studies consulted highlight the following:

- Lack of pedagogical and curricular project for teachers to take advantage of the potential of technologies in their classes;

- Lack of coherence between policy rhetoric and ICT integration practices in education;
- The existence of fragmented and non-dialogued public policies;
- Lack of funding and clear guidelines.

In summary, the analysis of the studies consulted regarding the factors that prevent the effective implementation of ICT policies in education, seek to warn about the less weighted practices and their reflexes in relation to the outlined purposes. These findings make it pertinent, for example in Angola, to consider sustainable strategies that safeguard the real needs and requirements of the project for the effectiveness of the process.

Among the measures outlined by the Angolan Executive regarding the integration of ICT in curriculum, according to the Ministry of Education (MED, 2011), one of the requirements for the fulfillment of the teaching duties in the school where the present study was conducted, in the path of the current reform, teachers should have the following profile: a) be a senior technician or equivalent in educational sciences; b) have at least five years of professional experience; c) have scientific knowledge of the subject to be taught; and d) receive training on new pedagogical resources.

In relation to the school, it should have the following Profile: schools repaired or built with 12 or more classrooms, and with all basic conditions that contribute to their normal functioning (room for the governing body, a secretary, electric current…), including libraries and labs in which we highlight computer science.

To achieve the objectives, the program of the subject of Informatics, according to the conceptions of the National Institute of Research and Development of Education (INIDE, 2013), the school proposes to attend, among others, the following political strategies:

1) Invest in the training and qualification of teachers for the execution of the program.
2) Bet on investments directed to the acquisition and assembly of computer equipment and construction of rooms / laboratories for this purpose.

In order to analyze and understand the impact of ICT integration policies in the school studied, implemented in the syllabus through the computer subject, we present the methodology adopted for the development of this research work.

4. Research Methodology

The present study fits into the interpretative paradigm, predominantly qualitative in nature, insofar as it seeks to understand the reality studied based on the interpretation and description of the participants' opinions and perceptions, as mentioned by the following authors. According to Yin (2015) and Amado (2017), in this type of study the purpose is to understand the real context in which and with which human beings interact.

Given the nature of the object under study and the research question, the exploratory case study project was chosen as a research strategy, given that the study seeks to understand a contemporary real-world phenomenon and make use of diverse sources of evidence in order to "capture the different views that translate this same complexity" (Amado, 2017, p.144).

For ethical reasons, the present study sought to safeguard not only the privacy of the participating subjects, but also the institution where the study was conducted, thus excluding its characterization. According to Yin (2014) the study of a contemporary phenomenon in its real context compels it to important ethical practices (protecting human subjects and in some cases the case under study), "so that as a result of their participation, they are not in andvertently undesirable position " (p.82). In this sense, in addition to the precautions mentioned above, we also obtained the informed consent of all those involved in the study and it was formally requested that their participation take place voluntarily.

It should be noted that 30% of the total number of teachers of the institution in which the study took place participated in the study, whose selection was based on the probabilistic sampling technique, criterion whereby individuls are chosen randomly (Freixo, n.d.). In addition to the questionnaires addressed to the respective teachers, one of the heads of the respective institution was interviewed as privileged informants, selected according to the non-probabilistic sampling criterion, that is, intentionally, because they have more time working in the direction the school in relation to the other elements of the governing body. It should be noted that part of the questions in the surveys result from the adaptation of the research carried out by Alves (2009), Silva (2014) and Mofarreh (2016). At this point, it should be clarified that the adapted questions were carefully readjusted to match the specificity of the ongoing study and its context.

Regarding the validation of the instruments, this was done by five of the six foreseen experts, that is, three reputable researchers / academician in the field of Educational Policy and two in the area of Educational Technology, selected according to their professional experience and scientific mastery of the two areas that cover the research theme.

Being so, tools designed follow sequence of the itens have been grouped in three order of magnitude: general characterization and access to ICTs; operational and strategic policies: ICT inclusion indicators and the processes associated with their operationalization; and factors promoting / inhibiting the integration of ICT policies in the school context.

Given the predefined categories ("actions developed "in the context of the implementation of ICT policies in the school studied; "Results"; "Constraints" and "promoter / inhibitor factos"), that is, previously selected taking into account the objective of the work and the research question, it was possible to build a script and conduct a sim-directive interview lasting about one hour. The answers were transcribed after several listening sessions, analyzed a priori through exploratory readings, ie "floating reading" according to Bardin (2016), and a posteriori "safely detailed

and decisive" according to Amado (2017, p. 313), This made it possible to organize the text, ie the answers in units of meaning and to fit into their respective categories according to their relevance (see attached table).

Whose answers have been transcribed, analyzed and organized according to their category (see attached). Thus, through the qualitative and descriptive analysis, as mentioned above, the respective process made it possible to synthesize the most relevant aspects and to perform the cross-analysis of the data presented in the following section.

5. Treatment, triangulation and analysis of results

In this section it is important to emphasize that the data obtained from different sources (questionnaire and interviews) were subjected to a data triangulation process, ie a cross analysis between the teachers' perceptions and the information obtained from the school management with a view to interpret and better understand the case study. In some cases, there was also a cross-analysis between the results of the present study and those of other researchers, which Prodanov & Freitas (2013) named "triangulation of researchers" (p. 64), aiming to confer "greater credibility and validity to the study performed " (Amado, 2017, p. 138).

Regarding the characterization that constitutes one of the three dimensions for data collection, the study made it possible to verify that in relation to the age group (figure 1), the teachers of the institution that participated in the present research work are mostly young (68%), ages 31 to 40 years. These results are in line with those obtained in the 2014 Population census, which show that the population living in the province where the school is located is mostly young.

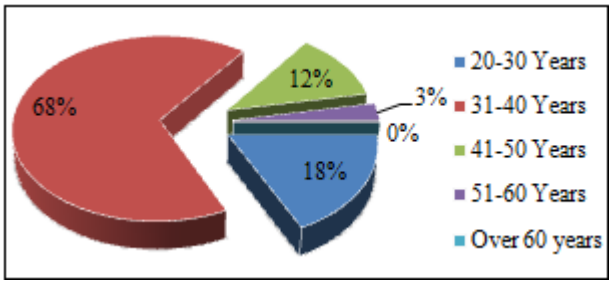


Figure 1: Age range of teachers

Regarding gender (figure 2), 74% of teachers are male, results that confirm those obtained by Bunga (2015).

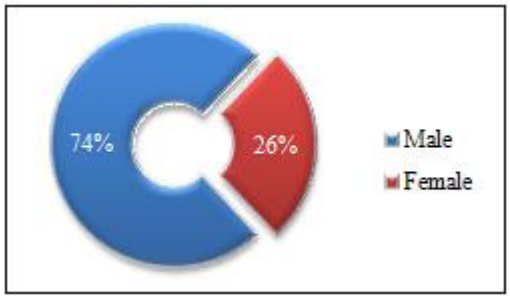


Figure 2: Gender of teachers

The discrepancy in terms of gender may be due to the fact that Namibe Province has only had higher education in the last 10 years and the vast majority of professionals resort to the establishment of other locations (Figure 3), for their training and with indicator of predominance for men.

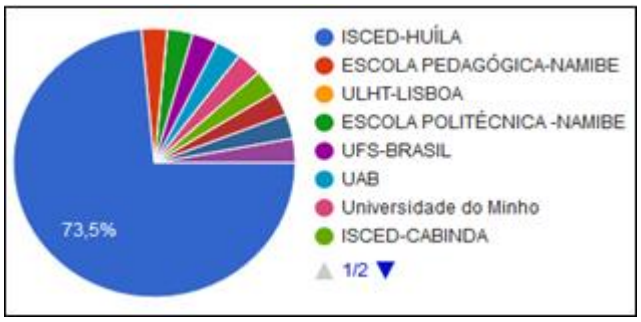


Figure 3: Institution where you graduated

Regarding academic qualifications (Figure 4), 62% of teachers have a Bachelois degree, 27% undergraduate students and only 9% have a master's degree.

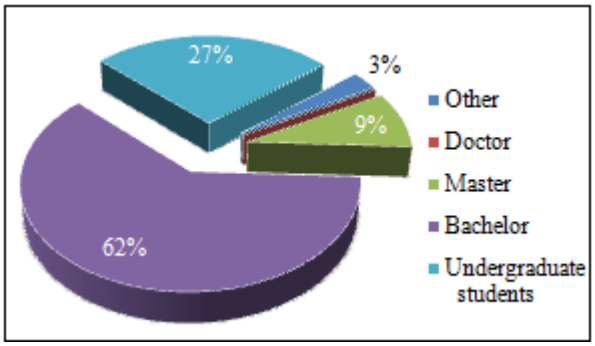


Figure 4: Academic qualifications of teachers

Regarding professional experience (Figure 5), most teachers (59%) have over 10 yars of experience and claim to have mastery of ICT use. The data presented above (academic qualifications of teachers and professional experience) show that most teachers in the school concerned meet the requirements of the Ministry of Education in terms of the profile of teachers to teach in the institution.

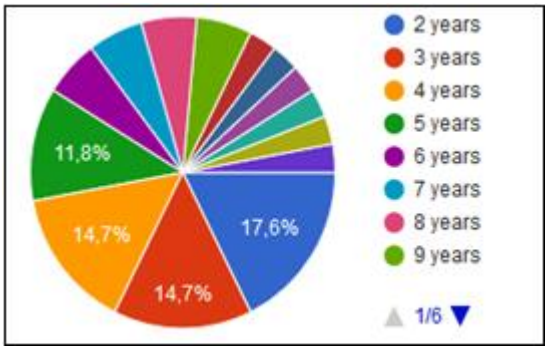


Figure 5: Professional Experience

Regarding the dimension "operational and strategic policies: indicators of inclusion of ICT at school level and processes associated with its operationalization", the results of the study carried out indicate that in the spaces where computers are located in the school (figure 6), 79% of teachers state that it is in the computer lab, over 50% of teachers say they can find computers also in the direction of the school, results that corroborate those obtained by Alves (2009). Cross analysis allows corroborating the respective evidence.

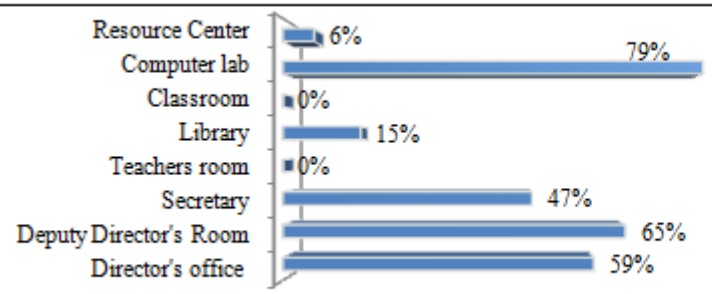
Teachers	Responsible interviewed
	In addition to the computer lab we can also find computers in the directors' offices, support services the direction…

Figure 6: Spaces of computers at school

Regarding the computer / student ratio in the computer room (Figure 7), 50% of the teachers using the computer room claim to have more than one student per computer, which can be confirmed by cross-analysis.

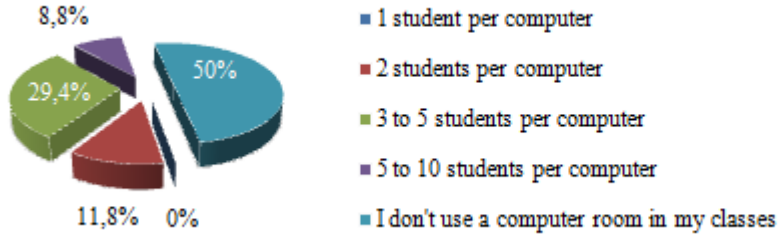
Teachers	*Responsible interviewed*
	The computer lab contains an overhead projector, a screen and 15 computers for 36 students, which corresponds to an average of two (2) students per computer.

Figure 7: Computer to student ratio in the computer room

Regarding the connection of computers to the internet at school (figure 8), 68% of teachers say that there is no computer connected to the internet, which can be confirmed by internal triangulation. The results presented above regarding access to technological means and services (computer and internet) confirm those obtained in 2014.

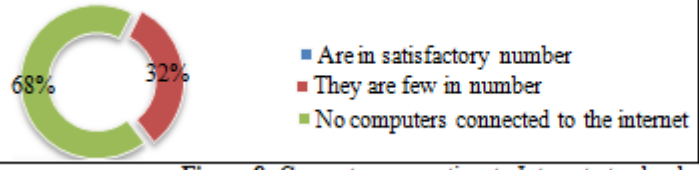
Teachers	Responsible interviewed
	There is no computer connected to the internet at school. The ones they use are through personal devices…

Figure 8: Computer connection to Internet at school

Regarding the school's ranking in relation to existing technological resources (Figure 9), 59% of teachers consider the school to be reasonably equipped, 35% consider it to be poorly equipped and about 6% of teachers said it was not equipped. From the triangulation and analysis carried out, it can thus be inferred that the institution in question lacks the equipping and renewal of the existing computer resources.

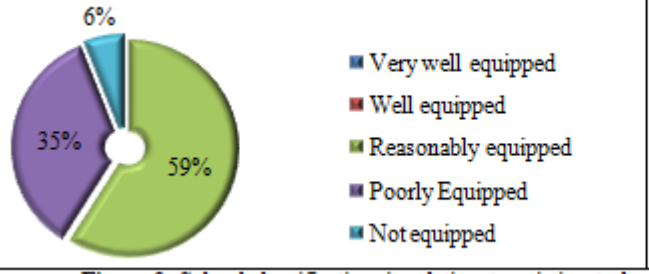
Teachers	Responsible interviewed
	We may consider it poorly equipped due to lack of replacement and updating of the respective equipment, for lack of financial resources…

Figure 9: School classification in relation to existing technological resources

Regarding the participation of teachers in training to teach with ICT in education (Figure 10), 65% of teachers stated that they did not participate in the training and 35% participated, results that are in agreement with those obtained by Dantas (2014). Cross-analysis confirms that the school has been for a considerable time without providing training for its teachers.

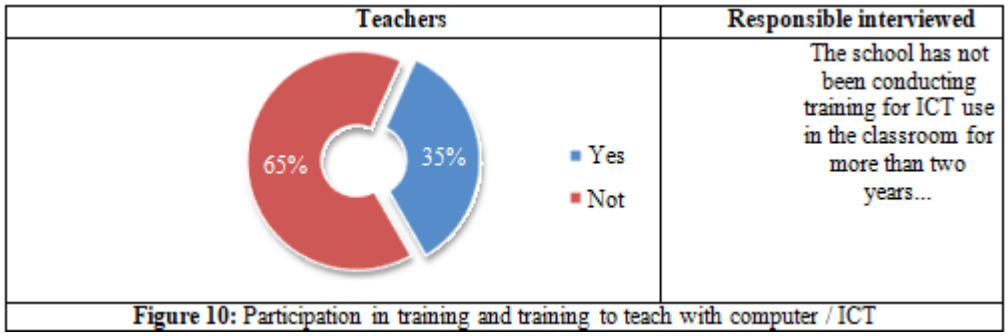


Figure 10: Participation in training and training to teach with computer / ICT

When asked why they will not participate in training to teach ICT in education (Figure 11), 63% of teachers said it was for lack of opportunity. Similar results are presented by Alves (2009).

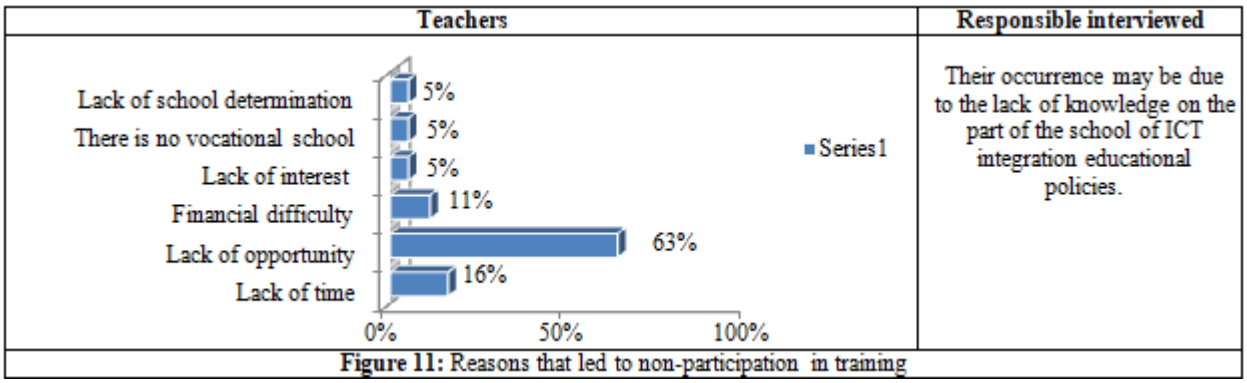


Figure 11: Reasons that led to non-participation in training

Regarding the existence of a specific project for the pedagogical use of ICT (Figure 12), 79% of teachers said they do not know if it exists and the remaining (21%) stated that there is no such project. The same results are also reported by Alves (2009) and Couto & Coelho (2013). Cross analysis also allows corroborating this indicator.

Regarding the commitment of school management to the successful integration of ICT use into school curriculum (Figure 13), 56% of teachers indicated that they feel it in part. Internal triangulation allows us to ascertain the evidence in question that is justified by the lack of financial availability. Similar results were presented by Waiti (2018) and Iglesias, Juarros & Gorospe (2011). According to the latter, this reality caused much discontent among the representatives of the schools involved in their study.

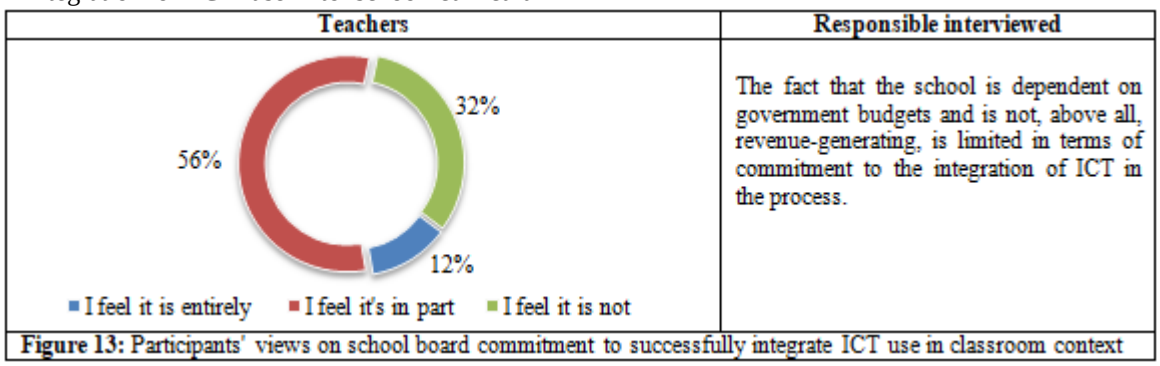


Figure 13: Participants' views on school board commitment to successfully integrate ICT use in classroom context

Regarding the factors that potentiate and hinder the implementation of ICT policies at school (Figure 14), Regarding the third dimension, the results indicate that the most prominent factors are investments in infrastructure and human resources. The results obtained corroborate those of Waiti (2018, p. 393) in concluding that *"These are personal factors related to teacher competencies in ICT, institutional factors related to ICT infrastructure"*.

The cross-analysis underscores the need for a serious investment bet as a factor that can enhance the policies in question, as can be seen in the transcript of the interview given below by the school board studied.

"To invest in the quality training of human resources and infrastructures and their maintenance, as well as the definition of sustainable policies, that is, with goals for its implementation and results that can be measured over a period of time, can drive the implementation of ICT integration policies in the school curriculum".

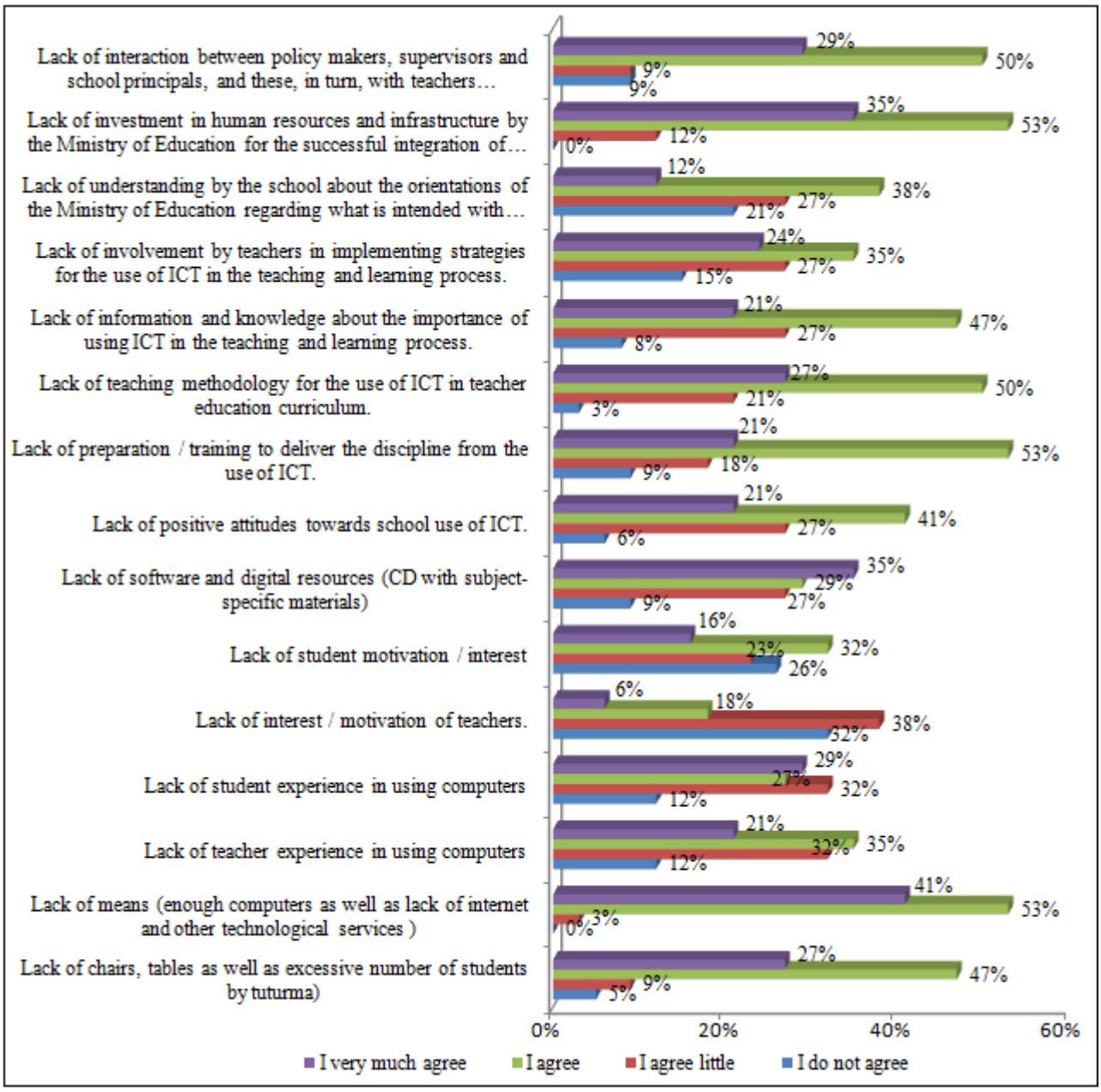


Figure 14: Factors that potentiate and hinder the implementation of ICT policies at school

6. Summary of Results

Regarding the dimension "operative and strategic policies: indicators of inclusion of ICT in the school and processes associated with its operationalization", in terms of actions developed, as one of the categories of analysis in the scope of the implementation of ICT policies at school level, stands out: a) the creation of the computer room and the placement of equipment (computers, overhead projector and screen); b) acquisition of internet services; and c) teacher training for the use of ICT. The results were not the best, ie the policies implemented were not efficient due to the lack of continuous investment as can be seen from the results presented above.

Regarding the limitations stand out: the lack of continuous teacher training for the use of ICT in the performance of their duties; the lack of maintenance and regular replacement of computer equipment; the high cost of computer resources and services; as well as the lack of financial autonomy, as well as a lack of coherence between what is envisaged in terms of the implementation of ICT policies in schools and their implementation practices (see attached).

Regarding the factors that hinder and enhance the achievement of results in the context of the integration of ICT policies in the school curriculum, stresses the need for serious and continuous investment in human resources and infrastructures and their maintenance, as well as the definition of sustainable policies, that is, with resources and goals for their execution and definition of results that can be measurable in an established period of time. The opposite sense, as well as the absence of a specific project to articulate ICT and pedagogy at school level, can be indicated as obstacles that make it impossible to reach the results outlined in the school curricula in reference as can be seen in figure 14.

7. Conclusions and recommendations

This research aimed to analyze the impact of ICT integration policies in the study plan of the school in which this study focused. From the analysis performed, the results reveal the possibility of the existence of a legitimate public policy, planned and implemented, but it needs more attention not only in the execution of operative policies, but also in strategic policies. This aspect, on the one hand, is one of the shortcomings noted and which may make it impossible to change the dynamics of the work culture and to create the conditions for the appropriate effects, On the other hand, it can position the school as retrograde in view of the fulfillment of the objectives outlined with the integration of ICT policies in the study plans. In this context, we subscribe to the reflection of Lima, Martins, Santos, Ribeiro, Vasconcelos & Valente (2010), By stating that it is not an easy struggle to link ICT to pedagogy, it is part of a continuous adaptation of the educational process to the new and continuous changes required by contemporary society.

In view of the aspects outlined above recommended: a) that the legitimate initiative to integrate ICTs into the study plan continues; b) development of a pedagogical project to articulate ICT to pedagogy at school level, without neglecting human, material and financial conditions for their maintenance; c) a real marriage between operative and strategic policies, that is, without the divorce that happens; and d) commitment of all involved, in view of the effectiveness of the process.

From an academic and investigative point of view, the results of this research work corroborate those developed in other contexts and therefore may contribute to their validity, which in this study fits into the context of ICT integration policies in school curricula in Angola.

Regarding the limitations of the study, it is pivotal to highlight the insufficiency of participants. One could also have chosen to involve actors at ministerial level in the design and implementation of ICT policies in the study plans of the II ESC schools the process under scrutiny.

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Annex

Summary table resulting from interview description, based on predefined analysis categories (“actions developed” in the context of the implementation of ICT policies in the schools studied; “Results”; “Constraints”; and “promoter / inhibitor factors”).

Actions developed	*Results*	*Constraints*	*Promoting Factors*	*Inhibiting Factors*
• Creation of the computer room and the placement of the respective equipment; • Contract for the acquisition of internet services; • Conducting training for teachers.	• Purchase of computers, overhead projector and its screen; • Providing internet service at school. • Teacher training for ICT use. • The awakening of students and teachers themselves to the importance of ICT in their activities;	• The disappearance of the line for continuous maintenance and replacement of computer equipment and Internet service in the institution, as well as the lack of financial autonomy; • Lack of continuous and specific teacher training for ICT use in class; • High costs of technology and related services. • Resistance to change in the working culture of teachers regarding the use of ICTs, because they do not feel obliged to do so; • Lack of mastery of ICT use by students, which impairs the lifespan of computer media.	• To invest in serious and continuous investment in teacher education and training for the use of ICT in class, as well as in the regular maintenance and replacement of computer equipment.. • Definition of sustainable policies, that is, with resources and goals for their implementation and definition of results that can be measured in an established period of time. • Creates more attractive programs that may interest teachers.	• Policy makers' lack of attention and commitment to comply with measures outlined in ICT integration policies at school; • The lack of a specific project to articulate ICT and school-level pedagogy. • Lack and coherence between what is idealized and the respective practices of ICT integration in schools; • Lack of awareness of the importance of using ICT in the school context.