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Integration of ICT in Education: A Study on the Policy Initiative for the Use of ICT in Secondary Schools in Namibe-Angola

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Abstract: ***The Government of Angola officially recognizes the important role of education and the need for a stronger incorporation of ICT in the educational system, to affirm the country in the new era – the information and knowledge society. In the present study, we sought to understand the process and impact of policies for the integration of ICT in the curriculum of secondary education in Namibe, following the study developed by the author (Bunga, 2019). Regarding the methodology, the exploratory case study was chosen, supported by a content analysis technique, as well as descriptive statistics for processing the data obtained through document analysis, interviews, and questionnaires. Regarding the results, the evidence indicates that the initiative in question aimed to provide secondary education schools with conditions for the inclusion of ICT in the curriculum of the respective institutions, putting money in relevant investments, namely: continuing education/training of teachers for the use of ICT in classes; creation/construction and equipping of ICT infrastructures in schools and internet access. On the other hand, the results show the existence of discontinuities and asymmetries in terms of investments, at the level of schools, which has called into question the effectiveness of the respective initiative.***

Keywords: Educational policies, ICT, Secondary Education, Namibe, Angola

1. Introduction

The impact of the development of information and communication technologies (ICT) in the social sphere is felt in different aspects of people's lives. In the educational field, ICT is seen as a supplement that can serve as catalyst for change, and contribute to the improvement of management, access and obtaining the best educational results. This is because they provide, to the educational process, the increment of new tools, activities and environments different from the traditional ones It can also provide the well-being of people and their involvement in lifelong learning (Paiva, 2002; Burns & Koster, 2016; OCDE, 2019). However, regardless of whether technologies make it possible to streamline and structure the educational process in a differentiated way, their presence at school does not guarantee educational innovation and not even the best academic results, as innovation involves profound changes both in terms of conceptions and behavior (Cardoso, 1997; Fullan, 2007).

It is important to emphasize that investment in ICT was one of the milestones on the agendas of the world Education forums held in recent years (World Forum on Education for All (2000); Education Forum (2030); Continental Education Strategy for Africa 2016-2025), in which the member states agreed, within the scope of the outlined commitments, to make the respective investments, in the educational field, in order to strengthen the education system so that trainees can acquire the necessary skills to live and work in the new era of the knowledge society.

Angola, by ratifying the commitments of the above-mentioned world education forums, is not outside the signed agreements. Accordingly, as well as within the scope of national commitments to improve the Education System, the Executive approved in 2001 Law 13/01, Basic Law for the Education and Teaching System which allowed to legislate the legal bases for carrying out the second post-independence reform in the country, with the objective of meeting the challenges of the sector, in terms of access and quality, as well as strengthening the effectiveness and equity of the Educational System. Alongside the restructuring of curricula, the creation of new areas of training, teacher training, rehabilitation and extension of the school network. The measures also include the approval of the National Plan for the Information Society, referred to below, and the integration of ICT in the curricula of the second cycle of secondary education, through the computer discipline, and the creation of medium and higher courses in this area, with the aim of providing students with technical knowledge and skills that allow them to use the computer and other technological resources in the exercise of their professional activities (Bunga, 2020).

From the above, the present study aims to understand the process and the impact of ICT integration policies in the study plans of the Public Schools of the II CES of Namibe, in the perspective of members of the Educational Administration of Namibe and Teachers.

As a function of the nature of the object of the present study, the following research question was formulated: what transformations emerged, in the opinion of the members of the Namibe Educational Administration and teachers, as to the ICT integration process in the formal curriculum at secondary school level?

Regarding the structure of this article, it is appropriate to note that, after the exploitation of the different recommendations and directives, in the supranational level, related to ICT integration policies in education, we describe below the policies for the integration of ICT in study plans in Angola and the international experience in the area. In the following point, the methodological options assumed are described and justified, the participants, and the procedures

related to the analysis and interpretation of the results of the research work carried out. Finally, there is a presentation of the results obtained, as well as an analysis and discussion of them through a process of data triangulation and ending with the presentation of the conclusions and the limitations of the study.

1) Guidelines/Recommendations of International Organizations for the Integration of ICT in Education

The worries and actions of the political agenda in the educational field, at a global level, are conveyed through various channels (official and unofficial), such as, for example, supranational organizations, which define guidelines and recommendations in various domains of the sector, including the integration of ICT in formal learning contexts. Accordingly, UNESCO (2018) emphasizes that, with the help of the teacher, ICT can allow students to become qualified users of information technologies and creative, innovative, and integrated members of society, insofar as, according to the OECD (2019), new technologies are seen as a facilitator of education. Its effectiveness, however, largely depends on how ICT is implemented in the classroom (European Commission/EACEA/Eurydice, 2019).

Regarding guidelines/recommendations on ICT policies, the work of Vacchieri (2013), published by UNICEF, suggests that supranational and national policies regarding the integration of ICT in the education system should be developed based on a strategy that seeks to provide a set of goals and a vision about the role of ICT in the education system aimed at the national interest of the country in question, in order to safeguard that they are not limited to operational policies.

Within the scope of the guidelines/recommendations on ICT policies, it is important to emphasize that it is one of the strategic objectives of the Continental Strategy for Africa 2016-2025 (CESA 16-25), exploring the potential of educational technologies to improve access, quality and management of educational establishments, in order to reorient the education systems of the countries of the region towards the realization of the vision of the African Union (AU) and Agenda 2063, based on the achievement of a peaceful and prosperous Africa that can stand out in the global community and in the knowledge economy. In this perspective, the following actions were defined, among others:

- Formulate policies for the integration of ICT in education, without neglecting continuing education programs for teachers, in order to allow the respective professionals to acquire the skills for the use of ICT in classes and to develop the skills of students in using them;
- Develop training actions for education managers on the use of ICT in the planning, implementation and monitoring of strategic programs for the sector;
- Promote the development of online content, taking into account the local specificities of African countries;
- Offer adquate and suficiente settings and equipments (for exemple, internet, electricity ...) and services (CESA, 16-25).
- As for the guidelines/recommendations on the teaching and learning process, it is important to emphasize that one of the guidelines of supranational organizations that marked the beginning of the 21st century is the commitment to investments aimed at the integration of ICT in education, to enrich learning and to develop in students the necessary skills for the new era – the era of the knowledge society, which implies, on the part of societies, the need to develop mechanisms for the creation of workforces that are not only reflective and creative in solving problems, but also digitally competent. In this perspective, the Commonwealth (2015) has deliberated a set of recommendations in which those presented below stand out:
- It is important that policies aimed at integrating ICT in education are developed based on clear implementation plans, with sufficient will and resources to ensure implementation;
- Establishing monitoring and evaluation mechanisms in initiatives aimed at the integration of ICT in education, at national and institutional levels, as it allows for the improvement of the implementation plan;
- The professional and continuous development of teachers should be considered fundamental in initiatives for the integration of ICT in education.

Regarding teacher training for the use of ICT in the teaching and learning process, UNESCO (2018) suggests that ICT skills for teachers be integrated into the three phases of the professional development of the educator:

- Pre-service - focusing on initial preparation in pedagogy, management and use of teaching tools, including digital resources;
- In service – opportunity for in-person and distance training; and
- Technical and pedagogical support to meet daily needs and facilitate student learning.

As for monitoring and evaluation in the context of the integration of ICT policies in the educational process, it is important to mention that the respective processes can play an important role in the improvement of the project and should be an integral component of the different phases of any ICT program or project for education. The processes in question can identify gaps between the stated objectives and their progress and achievements, which allows for adjustments and contributes to increase the probability of success in their implementation (UNESCO, 2011).

Additionally, it should be noted that, in addition to the guidelines that can have a positive effect on policies for the integration of ICT in the educational process, revealed by supranational organizations, it was also possible to check, in the consulted documents, that the respective organizations list a set of factors that have contributed to the lack of political impact on the initiatives implemented at the school, of which stand out:

- The lack of skills and positive attitudes on the part of teachers that would allow them to make the necessary changes in their teaching practices (European Commission/EACEA/Eurydice, 2019);

- Resistance to change on the part of teachers, sometimes motivated by policies they see as externally imposed without their contribution or participation (UNESCO, 2011);
- The lack of specific ICT policies or projects for education (UNESCO, 2011);
- The fact that sometimes national policies are mere symbolic acts designed to show concern or score points with political groups, special interest groups or donors, without providing the programs or resources needed to implement the policy (UNESCO, 2011).

In summary, we observe that the supranational guidelines and recommendations of the organizations mobilized in this section seek to help the integration of ICT in education, as well as alerting to certain factors that can have negative effects on this integration in a formal learning context.

If, on the one hand, the directives in question can help and positively influence the development of policy initiatives at the level of the educational systems of member states, on the other hand the fact that the respective policies present a top-down approach can often, and for different reasons, lead to them not being translated, as such, in the reality of the member states, as they cross the different realities in a uniform way, that is, without taking into account the local specificity.

2) ICT integration policies in study plans in Angola and international experience in the area

The approach to ICT policies in education in Angola leads us, initially, to the "White Paper" on Telecommunications, a guiding document for ICT policies in the country, and to the National Plan for the Information Society (PNSI), a targeted strategic plan to promote the information and knowledge society, with a view to modernizing, through ICT, the services provided by different social sectors, including education.

Through the respective instrument, the Angolan government has been devising a set of strategic measures based on direct investments in telecommunications infrastructure (project to build a national satellite, extension of the fiber optic network and submarine cables), "to support the various sectors of the national economy, education, innovation and development and the massification of ICT, key factors for strengthening the information and knowledge society" (GRA, 2019, p. 11). In this regard, and with synergies aimed at boosting the information and knowledge society, the Angolan Government approved, in 2005 (with subsequent update for the period 2013-2017), the PNSI.

Regardless of whether the PNSI covers several sectors, the figure below (figure 1) depicts only the lines of action and program related to the education sector, considering the investigation objective of the present research work.

Figure 1: Pillar, Lines of Action and Program for the Education sector

Cornerstone	Lines of action	Program
Pillar 5 Education	A - Strengthen ICT skills	1. ICT certification. 2. Consolidation of ICT in the education system. 3. Teacher training in ICT.
	B - Strengthen the use of ICT in the education system	4. ICT in schools. 5. school information and management.
	C - Increase access to information and content	6. Digital content. 7. Open and distance education.
	D - Promote scientific research and experimental development	8. University network to support innovation. 9. Technological Incubators.

Source: GRA (2013)

The figure below (figure 2) shows the goals defined for the period 2013-2017, related to the education sector, under the PNSI.

Figure 2: Targets defined for the education sector under the 2013-2017 PNSI

Pillar	Indicator	Base value	Goal 2017
Pillar 5	Number of certified ICT professionals	--	3.000
	Teachers with ICT education	--	100% Secondary Schools
	Number of computerized schools	--	100% Secondary Schools
	Student to computer ratio	--	20
	Educational institutions with internet access	--	100%
	Students enrolled in distance learning	0	20.000
	Mailbox for Student and Teachers	--	500.000
	Patent and Trademark Rights	8.253/2012	15.000
	Higher education institutions linked to the national research network	--	75%

Source: GRA (2013)

From the analysis of the data contained in Figures 1 and 2, outlined within the scope of the PNSI, it is possible to verify that a set of actions/intentions and quite ambitious goals were devised regarding the integration of ICT in education. Accordingly, it should be noted that, among the initiatives being undertaken by the Angolan government for the insertion of Angola in the information society, official recognition of the important role of education in national development and the need for a stronger incorporation have been highlighted of ICT in the education system. However, the integration of ICT in the country's educational process has been developed not only through the development of strategic programs, as shown above, but also through initiatives aimed at restructuring study plans that allow the

development of disciplines and courses in the area. As an example, we highlight the educational computer course for the training of teachers and students, with emphasis on the II CES, and other measures aimed at secondary education institutions and the school community (managers, teachers, students, parents and guardians, education, and business), a process developed under the current educational reform (Bunga, 2020).

From the above, there are already visible and relevant signs in relation to the integration of ICT policies in education in Angola. Perhaps there will be a lack of other types of measures and initiatives such as those developed in some countries in America and Europe, such as the USA, Brazil, England, France and Portugal.

The bibliographical research and the respective analysis carried out allowed us to verify that, in addition to the political dimension in the scope of the reforms for the integration of ICT in education, the countries mobilized numerous initiatives aimed at the financing of projects, programs, studies, software development, as well as content, involving professionals with scientific-technological competence, universities, study centers in the area and the private sector. Among other aspects, we highlight initiatives that envisaged to foster the massive use of ICT by part of the school community.

At the level of the African continent, there are studies that indicate that several governments have already undertaken a set of public policy measures for the integration of ICT in the educational system. The study developed by Farrell & Isaacs (2007), in 53 African countries, reveals that 36 had an effective ICT policy in education. On the other hand, of the various African countries that have been implementing these policies, not all do so consistently, that is, they lack a policy that seeks to effectively promote the integration of ICT in the education system with investments in infrastructure, such as telecommunications, for example, or ensure budgets that support the respective actions.

From the survey of studies on ICT integration policies in education, it was possible to infer that in countries such as South Africa, Cape Verde, Mozambique and Namibia, regardless of the limitations they have been facing in operational, strategic and pedagogical terms, there has been a persistent struggle in search of new strategies, projects and programs aimed at the effective integration of ICT in education:

- South Africa – e-Education Policy, with the intention of transforming learning and teaching through ICT (Padayachee, 2017);
- Cape Verde – the Mundu Novu program, which aims to provide educational establishments with technological infrastructure and connectivity and revolutionize pedagogical practices with the use of ICT (Tomar, 2014);
- Mozambique – the Technological Plan for Education, which aims to modernize teaching and change the paradigm of learning through ICT (Junior, 2019);
- Namibia – the TECH Plan! NA, with the intention of: a) equipping educational institutions with hardware, software, connectivity, curriculum, content and technical support; and b) educate/train managers, administrative staff, teachers and students with literacy and ICT integration across the curriculum (Afunde, 2015).

In summary, it is important to note that the challenge taken on by the MDEs of the aforementioned countries, including Angola, within the scope of the objectives outlined with a view to achieving a successful integration of ICT in the education system and, at the same time, prepare the current generation of students for insertion in the knowledge society, in which ICT tools, such as computers, smartphones, internet and other related technologies, are becoming increasingly ubiquitous in the daily lives of citizens and businesses. It is necessary that the respective intentions are accompanied by policies that ensure that the objectives are achieved, that is, accompanied by sustainable strategies in the medium and long term and thorough collaborative work, without neglecting the investments aimed at the continuous training of human resources and in properly equipped ICT infrastructure in schools, investments that can provide a greater probability of achieving success in the outlined policies.

2. Research Methodology

The present study fits into the interpretive paradigm, predominantly qualitative in nature, as we integrate data and quantitative analysis techniques, which will serve as a complement to support the inferences (Yin, 2015).

Regarding the instrument and data collection techniques, we opted for document analysis; survey through semi-directive in-person interviews and a questionnaire.

Regarding the participants, it should be noted that 11 members of the education sector at provincial level were interviewed, with responsibilities in the integration of ICT policies in the II CES schools, selected according to convenience, non-probabilistic sampling criterion (Sampieri, Collado & Lucio, 2013). Regarding teachers, 30% of each institution participated in the study, out of a total of eight institutions of the II CES, out of the 20 existing in the province, whose selection fits the probability sampling technique, a criterion by which members are chosen at random (Sampieri, Collado & Lucio, 2013).
As for the schools, the criteria for their selection were supported, in a set of requirements that was precisely shaped by a balance between:

- Existence of representativeness of the II CES schools at provincial level, in terms of training áreas;
- Schools of the II CES in the province that bring together not only conditions for the administration of theoretical classes, but also practical classes related to ICT/Informatics.

Based on the nature of the data collected, the treatment and the respective analysis were based on the technique of content analysis, descriptive statistics and data triangulation.

To understand the meanings contained in the data obtained, either through the interviews or from the collected documents, the category analysis technique suggested by Bardin (2016). Thus, the data collected, in the case of the interviews, were transcribed and, subsequently, submitted to

a process of general review of the transcription carried out. In the next step, data from both sources were analyzed a priori in exploratory readings and later, in a "safe, thorough and decisive" way (Amado, 2017, p. 313). After reading and rereading the documents, and considering the defined categories of analysis, two synthesis-grids were prepared, presented in the annex (see annexes 1 and 2). It should be noted that, in some cases, there was a need to redefine the categories defined a priori, that is, previously selected taking into account the objective of the work, research question and the consulted documents. Additionally, it should be noted that there was a need to increase new categories, whenever justified considering the relevance of certain information revealed by the data.

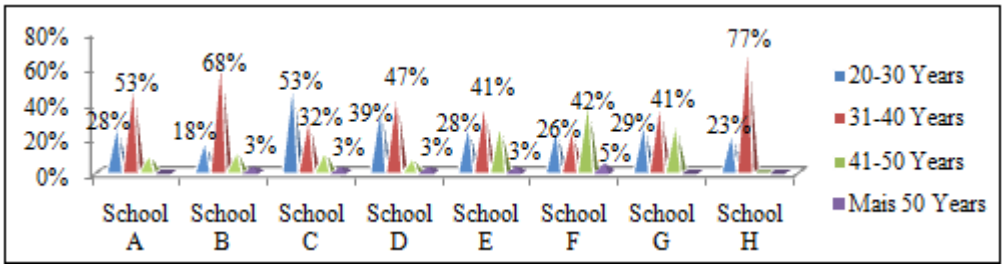
Presentation, analysis and triangulation of results

In this section, the results are presented and analyzed through a process of data triangulation.

Characterization of participants

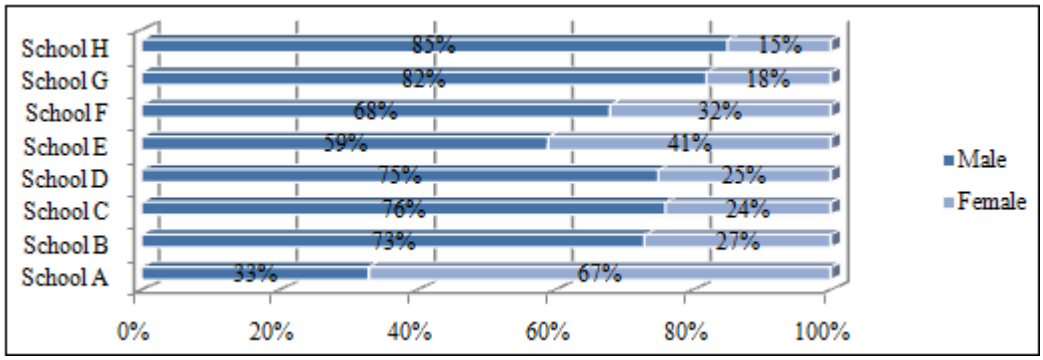
Regarding the participants, it should be noted that, for reasons of consent, the elements interviewed were not characterized. The respective procedure helps safeguard the anonymity of the subjects involved in the study (Bogdan & Biklen, 1994; Yin, 2015; Amado, 2017).

As for the questionnaires applied, the results of the research work carried out allowed us to observe that, in relation to the age group (graph 1), except for respondents from school F, in which most of the answers focus on the interval between 41 and 50 years old, the teachers who took part in this study are mostly young.



Graph 1: Age range of teachers

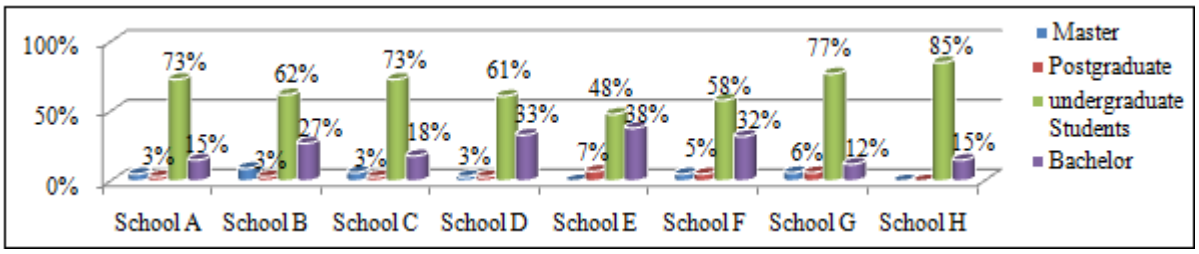
In relation to gender (Graph 2), it is important to emphasize that most participants of the institutions in which this study focused are male, except for the respondents from school A, whose majority (67%) are female, results that confirm those presented by the Education Office (2019).



Graph 2: Gender of teachers

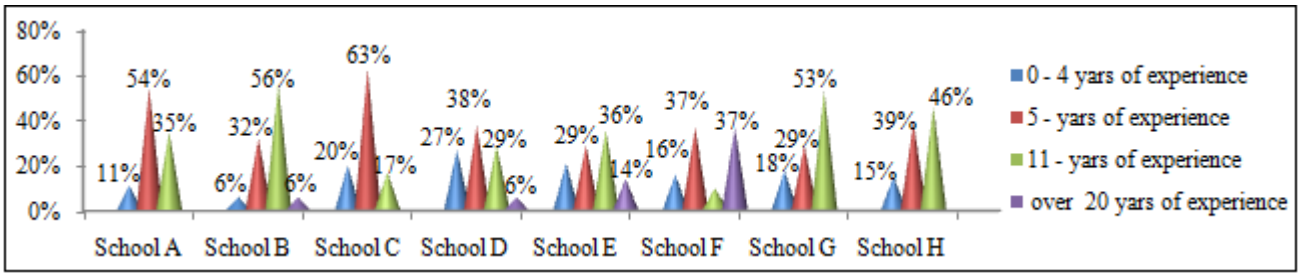
The discrepancy registered in terms of gender (Graph 2) may be because the province of Namibe has only recently been covered by the network of higher education institutions, as mentioned above, and most professionals resort to "institutions from other locations" (Bunga, 2020, p. 149), for continuous training and with indicators of predominance of men.

Regarding academic training (Graph 3), most respondents have a bachelor's degree, which may be related to the fact that postgraduate courses in Angola are still taught intermittently and with high costs.



Graph 3: Academic qualifications of teachers

Regarding professional experience (Graph 4), most teachers have more than five years and claim to have mastered the use of ICT.



Graph 4: Professional Experience

At the outset, the fact that a large part of the collective of teachers is young, is in the early stages of professional careers and is familiar with the use of ICT, may contribute to a greater probability of adherence to pedagogical innovation through ICT and, consequently, a better integration of them in their teaching practices.

Strategic policies - indicators of ICT inclusion at school level and processes associated with its operationalization

In the study developed, we sought to identify and understand, based on the experiences lived by the participants, the meaning they attribute to the ICT integration policy, either at the level of the decreed plan or the plan of actions, which led to the definition of the category designated policies described and three subcategories:

Regarding Subcategory A – national guidelines for action –, the results indicate that, regardless of the country presenting a national policy focused on information and communication technologies and a National Plan for the Information Society, which includes the education sector, there is no specific document or program at national or local level, capable of guiding the integration of ICT at the level of the II CES schools.

The finding verified, may at the outset hinder the development of the respective political initiative, as can be seen in the testimony of one of the interviewees, which is presented below:

> "One of the biggest problems we live is the lack of information, which translates into a policy without clarification of what is intended with the executors and beneficiaries, giving the idea that things seem to 'fall from the sky'... Nobody knows what should be followed, what are the steps […]" (E5).

From the above, it should be noted that the lack of a document with guidelines on how to proceed in the development of initiatives for the integration of ICT in schools, combined with the lack of experience in activities of this kind on the part of the executors, being a recent experience in teaching in Angola, it may compromise the ability to execute and implement the purposes defined around the respective project.

As for subcategory B – Perceptions of participants in relation to the enacted policy –, it should be noted that, in the absence of the respective reference document, what we tried to do was to explore the Curriculum Policy Law Proposal and other documents related to the different schools of the II CES studied, as well as the "balance report on the implementation of the 2nd reform of education in non-higher education subsystems" produced by the Ministry (MED, 2011).

In the respective documents, it was possible to identify a set of guidelines, measures and principles related to the integration of ICT policies at the level of secondary schools. For example, in relation to the Curriculum Policy, in chapter II of article 18 it is stated that:

> "Curricular accessibility aims to ensure the right of actors involved in the intentional educational act to access all curricular materials and equipment necessary for the operationalization of the teaching-learning process" (MED, 2019).

Accordingly, it seems that this principle ensures, at the level of schools in general and, in particular, of the II CES, the conditions, in terms of educational resources, including technological resources, indispensable for the realization of good teaching-learning practices, with a view to quality education.

Regarding perceptions, most respondents expressed their appreciation for the political initiative from a projection point of view. It is important to highlight, however, the statement by respondent E8 when he stated that "[…] the project to integrate ICT at school level was poorly designed because teachers were not consulted […]". Below are the selected text units:

- "In relation to the assessment of ICT integration policies at the level of the study plans of second cycle schools, I can say that it was well designed" (E3; E6).

- "From a projection point of view, the integration of ICT in our institution was an asset […]" (E7).

- "From my point of view, the project was very well designed because we are following the evolution of the world itself. Today, technologies play a fundamental role in obtaining knowledge" (E11).

As can be seen in the textual units presented, most respondents express their appreciation for the political initiative from the point of view of projection, which arises as a result of the restructuring of the study plans, within the scope of the current reform.

Regarding the integration practices of ICT policies (subcategory C), most participants stated that, regardless of whether the policies enacted are well planned "because we are following the evolution of the world itself" (E11), as well as to delve into seeking to face the need for "ICT linked technical professional staff" (E6), they stall as to its operation, that is, in the opinion of another interviewee, "it is not viable, considering the non existence of material conditions" (E9). The respondent adds: "when placing the subject in the curriculum, the school should be equipped first. This incongruity that is verified does not help […]". In this regard, the selected textual units are presented:

- "[…] The non-compliance with certain issues, that were previously designed within the scope of ICT integration policies, is that it made it difficult, that is, it created some flaws in the same implementation […]" (E6).

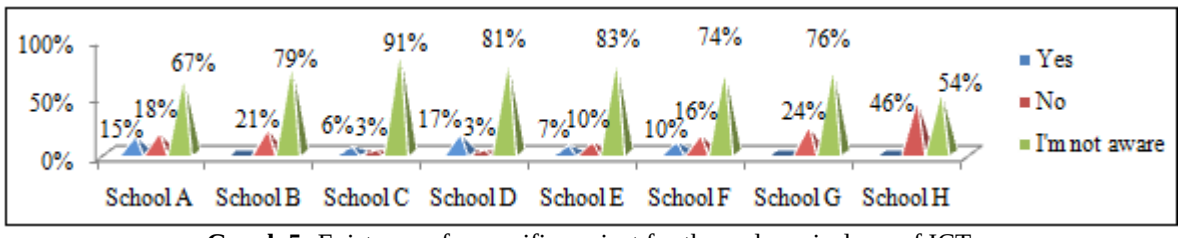
- "In relation to the assessment of the project for the implementation of ICT policies at school level, it can be considered that it is not viable given the lack of material conditions. For example, when placing the subject in the curriculum, they should equip the school first. This incongruity that is verified does not help […]" (E9).

- "[…] The design was well conceived, but the practice leaves a lot to be desired, that is, the coherence between the rhetoric and the respective practices of ICT policy integration is not verified […]" (E11).

Reading the respondents' narratives about ICT integration practices in study plans, on the one hand, reveals that the initiative has not been promoted according to the assumptions established in the guidelines plan (see Bunga, 2020).

Regarding the question as to the evaluation/supervision of the ICT integration process at the level of the schools studied, it is worth noting that it was possible to observe the absence of monitoring and evaluation in the development of the respective initiative, as can be seen from the statement of one of the interviewed elements: "[…] it is rare for us to monitor, that is, develop a specific program for monitoring the IT area" (E3). In this regard, it is important to emphasize that the monitoring and evaluation process can make all the difference in gender initiatives, as it allows for the detection and prevention of insufficiencies that could compromise the achievement of the recommended results. If the monitoring and evaluation process is, however, done with some advance, readjustments can be made and thus provide a greater probability of achieving success in the project undertaken (UNESCO, 2011).

When asked if there is a specific project for the pedagogical use of ICT at school level (graph 5), most teachers claim not to be aware of the existence of the respective projects in the institution.



Graph 5: Existence of a specific project for the pedagogical use of ICT

The triangulation carried out, with the data that emerge from the analysis of the interviews in this study, corroborates the evidence in question, as can be seen in the textual units that are presented below:

- "As for the existence of a project for the integration of ICT in the study plans at school level, it is important to mention that we do not have it as such" (E4).

- "With regard to the existence of a specific project to articulate ICT and pedagogy at school level, it does not exist" (E7).

- "[…] We do not have a specific project for the integration of ICT at school level […]" (E8).

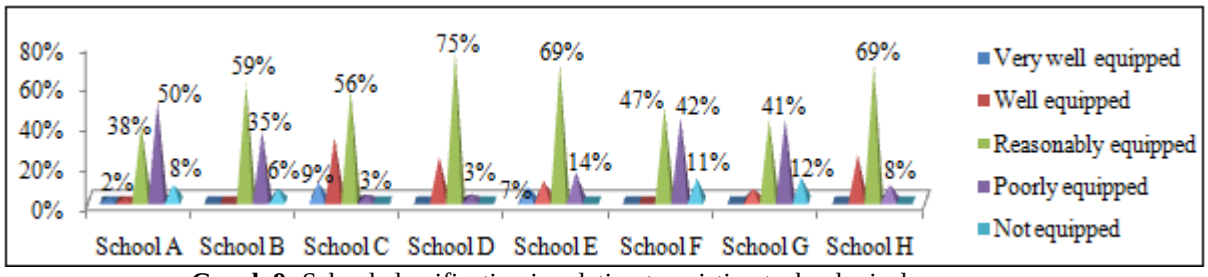
- "Regarding the ICT area, it is important to say that we do not have any specific project; we only work with the INIDE curriculum" (E10).

The evidence presented above is an indicator that, in addition to the curriculum, there is no other supplement, in terms of project, whether local or national, for the effective integration of ICT in the study plans of the education cycle

in question. In this regard, it should be noted that the presence of ICT in schools, if not accompanied by a well-founded strategy for their integration in pedagogical activities, can be reduced to a simple increase in existing school resources, without having an impact. directly in the dynamics of the actors' work culture (Pimentel, 2013; Rincón, 2017).

Operational policies - indicators of ICT inclusion at school level and processes associated with its operationalization

Regarding the dimension "operational policies – indicators of ICT inclusion at the level of schools and processes associated with its operationalization", the results of the study carried out indicate that: Regarding the classification of schools in relation to existing technological resources (Graph 9), the most expressive results reveal that most respondents admit that the schools where they work are not properly equipped, given the indicated options ("reasonable" and "poorly equipped") make up the highest percentage at the level of all institutions.



Graph 9: School classification in relation to existing technological resources

The triangulation carried out with the data emerged from the analysis of the interviews validates the respective evidence, as can be seen in the selected text units:

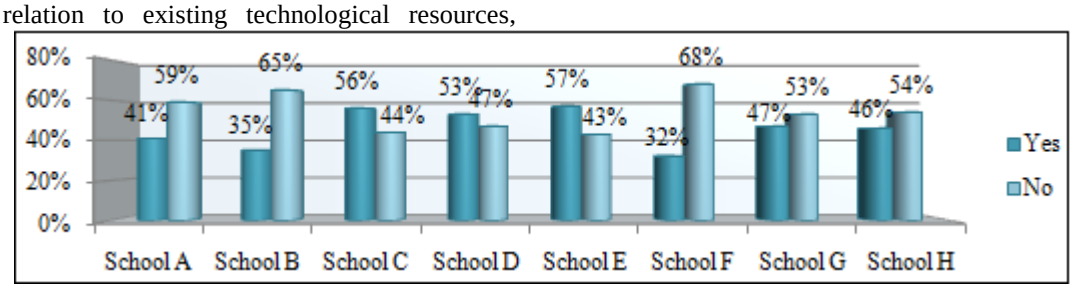
"In terms of equipment, we can consider that it is not equipped […]" (E4...).

"[…] With regard to the existence of equipment, we can say that the rooms are reasonably equipped […]" (E7...).

"[…] As to a computer room and respective equipment, we have some difficulty […]" (E10).

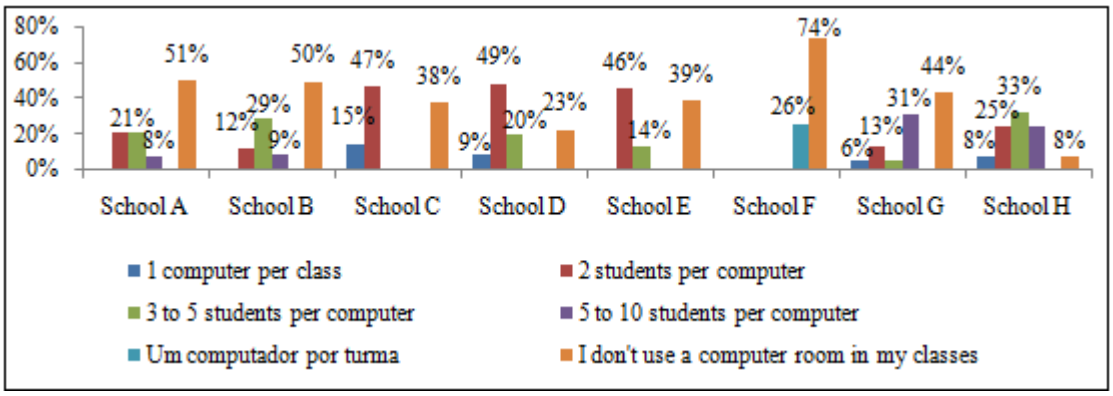
The analysis of the evidence, regarding the classification of schools in relation to existing technological resources, reveals that the institutions studied lack the computer equipment and renovation of the existing, due to lack of purchasing power, in some cases, or lack of replacement and updating of existing technological resources, in others.

As for participation in training actions to teach with ICT at school (Graph 11), the results show that only the majority of respondents from three institutions, that is, from schools C, D and E, assume that they have participated in the respective actions of formation. Similar results are presented by the MED (2011, p. 69) when pointing out the record of "non-compliance with the multiplication seminars" aimed at training teachers in the provinces.



Graph 7: Participation in training to teach with ICT in education

As for the computer/student ratio in the computer room (graph 7), we can see that the results are very dispersed. The analysis carried out showed that most institutions included in the study have a ratio of more than three students per computer, except in schools C, D and E. In the case of school F, 26% of teachers who use the computer room declare that there is only one computer per class.



Graph 7: Computer to student ratio in the computer room

The cross-analysis regarding the computer/student ratio validates the evidence from the analysis of the interviews, as well as the existence of asymmetries, as can be seen in the selected textual units:

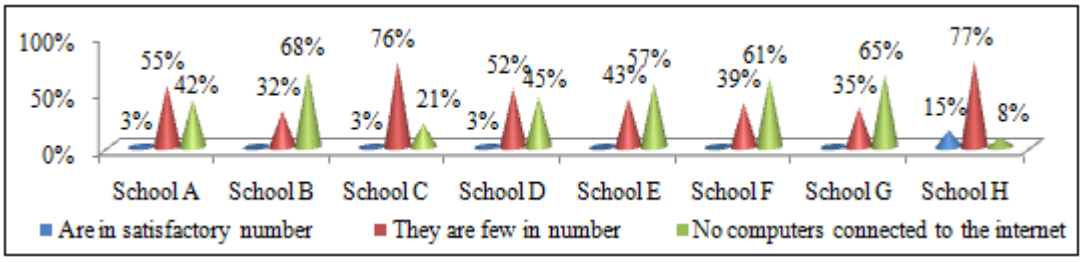
- "Regarding the computer/student ratio in the computer room, the average is two students per computer… (E6; E7; E8).

- "Regarding the computer/student ratio in the computer room, in schools not dedicated to technical-professional education, the average is 3 to 4 students per computer, and this really concerns us" (E1).

- "The computer/student ratio in computer rooms is normally 15, or fewer computers, for 35 students…

From the analysis of the evidence regarding the computer/students ratio in the computer room/laboratory, the results again validate the existence of asymmetries.

Regarding the connection of computers to the internet (Graph 8), most teachers from schools A, C, D and H who participated in the study stated that there were a small number of connected computers, and most teachers from schools B, E, F and G declare that there are no computers connected to the internet in the institution.



Graph 8: Computers connection to internet at school

Crossing the data in Graph 8 with those from the analysis of the interviews, the evidence indicates the same direction, that is, the existence of restrictions in terms of internet access at the level of the schools studied is confirmed. The following are some textual units extracted from the interview analysis table:

- "In relation to the internet, schools need to improve a lot in this regard, because it really is very restricted… it is more used for work at the level of the directorates themselves […]"(E2; E6).

- "As for the internet signal, unfortunately we don't have it available for everyone, because prices are high and the school is unable to afford it […]"(E4).

It should be noted that the results presented above, referring to access to technological means and services (computer and internet), confirm those obtained in the 2014 Census, which shows that the proportion of the population with access to them is quite small (8%). Restricting the use of the internet only for management services, which is justified by the high cost of the respective services, turns out to be of little benefit to the teaching and learning process. In fact, access to the internet by teachers and students in realities such as Angola – where libraries do not have much to offer, that is, they still lack investments in terms of textbooks – may very well address this and other shortcomings. It would thus be a way for teachers and students to have access to different content, enrich their knowledge, as well as the teaching and learning process itself, which in the present age of information and knowledge is gaining other contours and dimensions different from the traditional ones.

3. Conclusions

In summary, the study developed stems from the concern to understand the process and impact of the integration of ICT in secondary schools in Namibe province, resulting from the restructuring of study plans within the scope of the reform in force in Angola. Among the research already carried out in educational investigation in the country, this is one of the few studies carried out with this purpose, so we think that this research work can contribute to the reflection on public policies in the area.

Responding to the research question raised, in a synthetic way, and within the transformative power of the enacted

reform, it is important to emphasize that the results that emerged from the treatment and analysis of the data presented lead us to infer that the process of integrating ICT policies in schools of the II CES in Namibe, resulting from the reform in force in Angola, was marked by a set of investments that, although not transversal (since they did not occur in all schools), allowed the organization and transformation of certain institutions to achieve the objectives outlined within the policy initiative in question, namely: the creation/construction of computer rooms/laboratories and the respective equipment; b) the training of teachers for its use; and c) internet service availability.

However, it is important to emphasize that the impact of these investments was not substantial, as the implemented policies needed greater attention in execution, as there was a discontinuity and an asymmetry (between schools) in terms of investment, which indicates that the process of integrating ICT in the study plans of the analyzed schools has not been systematically promoted, jeopardizing the effectiveness of the respective initiative. Among the weaknesses verified in this study, the following are mentioned:

- Absence of a specific document or program that is a reference to national or local guidelines for action, clear and easily accessible, capable of pointing out the guidelines for the execution and implementation of the purposes outlined in the scope of policies for the integration of ICT in the schools of the II CES;
- The lack of financial sustainability to support the effective integration of the respective political initiative in the study plans of the schools studied, with a direct consequence in the continuity of investments, both for the continuous training of teachers and for the acquisition, maintenance and replacement and updating of technological resources;
- The lack of sufficient technological resources, including internet services for all students and teachers;
- The existence of schools that teach only theoretical classes due to lack of technological resources;
- The lack of school projects that encourage, enhance and increase pedagogical practices based on ICT and other initiatives that allow the articulation of ICT and pedagogy at the level of the schools studied;
- The lack of teaching methodology for the use of ICT in the teacher education curriculum;
- The lack of monitoring and evaluation programs that can contribute to the improvement of the ICT integration process in the analyzed schools.

4. Suggestions / Recommendations

In this perspective, the need for continuous investment in the training of human resources and in infrastructure and respective maintenance is highlighted. In parallel, it is also essential to develop a systematic monitoring and evaluation program, as well as awareness, both on the part of leaders and the educational community in general, of the importance of using ICT in the teaching and learning process and its benefits, without discarding the interaction and commitment of the respective actors, regarding the needs that are imposed, with a view to the effectiveness of the process.

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