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Use of ICT Tools by Kinshasa Primary Schools Students both During and After Class: State of Places and Perspectives

MANDA BENJAMIN KISIMBA[1]

[1]Faculty of Education, International Center for Teacher Education, East China Normal University, Shanghai-China

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***Corresponding Author:**
MANDA BENJAMIN KISIMBA
ben.manda92@gmail.com

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There are no conflicts to declare.

ABSTRACT

The field of ICT has profoundly changed the organization of traditional methods of teaching and learning in the world education systems; that largely affect daily habits in schools and in families. The key stakeholders, namely principals, teachers, parents and students are called to lead, teach and learn differently. A disgusting observation has already been deplored: the culture of the use of ICTs in school curricula in Democratic Republic of Congo is still considered as a luxury in certain regions of the country, and even in the capital city. The low investment in computing tools by the principals and parents, the inexistence and / or the relatively high costs of internet access, the lack of skills and training required to teachers and parents in this area, etc. are not promoting the good popularization of the importance of ICTs for the integral development of future executives of the Nation. It is within this framework that this paper had the objective to conduct a study on the use of ICT by the students in primary schools in Kinshasa during and after class, in order to assess the current situation, and to propose solutions, with the aim of contributing to the effectiveness of the integration of this field into the daily lives of students at school and at home. We opted for a mixed research method: quantitative and qualitative, administered by questionnaires, and semi-structured interviews to 108 participants including 3 principals, 45 parents and 60 teachers from 3 different primary schools. After analyzing data, the results reveal that the use is definitely palpable with the manipulation of computers (especially at school) and phones (on a large scale at home), but disparities are noted which prevent a good assimilation of ICT by the students: whether for teachers and parents, lack of resources, low level of knowledge and skills, are parameters that reduce the use of ICT by students.

Keywords: ICT, DURING AND AFTER CLASS, STUDENTS

1.Introduction

The Congolese government by means of the ministry having as attribution of the higher, secondary and primary education, has promulgated a ministerial decree in 2004 making public the use of ICTs in the

curricula of primary school lessons (DRC Ministry of Education , 2015) : the aim being not to train ICTs experts directly, but rather to enlightened users who are able of certain form of autonomy in solving the most common problems faced by all those who use new technologies, including computers; in order to do an important role in a constantly changing society. It is worth noting that if yesterday to be illiterate was not to know how to read and write, today the lack of knowledge (use) of the ICTs, especially the computer, is part of it. It should be noted that today's life is guided by a technological revolution like never before. Whether in schools or in families, some traditional devices are largely replaced by those who are in the "HiTech" category, in order to facilitate learning both in the school environment and at home (C. IsaBelle., C. Lapointe & M. Chiasson , 2002) . That is to say that the integration of ICT tools in learning becomes a necessity to raise the level of education in a nation that wants to be emerging by 2030, according to the Objectives of Sustainable development. The current situation on the use of ICT tools by students is largely weak in Democratic Republic of Congo; despite the fact that the majority of stakeholders in the education sector admit that literacy training with the help of ICT is important in a highly computerized world (J.M Fourgous, 2012; G.L. Baron, 2012). Most schools and houses do not have ICT tools, and always refer to the traditional methods made available to pupils in their education (J. Grazyna,2013).

This paper focuses on an inventory-making of the current use of ICT tools by students in school and at home. Thanks to the inventory, the positive aspects will have to be sustained and improved, while the negative aspects will have to go through a meticulous analysis in order to propose measures adapted to the financial and technical conditions of schools and families. A survey was conducted on the level of teachers as well as those responsible for students in relation to their skills in the use of basic ICT tools. Indeed, an increased and exemplary use of ICT by a growing number of teachers will probably enable more and more students to develop their technological skills, and above all, will promote the development, among these young people, of a whole skills needed to become citizens of the third millennium (C. Raby, 2004).

2. Materials and methods

To bring out simple and sustainable proposals at the end of this paper, we opted for a mixed research method: both quantitative and qualitative. The aim of this mixed method is to promote data by different means. The complementarity between these methods aims to overcome some of the deficiencies that could be observed using a single process (A. Holo, 2010).

The data collection within the CARMEN SALES Primary School, BILOMBE Primary School and STABLUM Primary School in Kinshasa was carrying out with careful reference to the research questions. This paper focuses on the ability of students to use ICT Tools during and after class. The level of knowledge and application of ICT tools by students in their learning process is directly linked up by the skills of teachers and parents (Marty, 2003). On this, the respondents of this paper were principals, teachers and parents of the pupils: note that the ideal was to interview the children directly, but given that they are not at an age early

enough to deal with an interviewer, we wanted to go through the parents.

The survey was conducted between December 2019 and February 2020. Since the respondents are French speakers, the first thing to do was to translate the questions into French. The questionnaires were composed of open questions, closed and multiple choice answers addressed to teachers and parents in order to obtain statistics of the existing situation: (e.g. A) Yes, B) No; A) Never, B) Rarely, C) Often, and E) Always; A) Null, B) Good, C) Excellent, etc. The teacher's questionnaires were composed of 2 sections: The first was focused on the names of schools, the gender, the age range and the level of study of respondents and the second section of 11 questions; and the parent's questionnaires was composed of 7 questions. Whether for teachers or parents, the questions were more focused on the level of knowledge and use of ICT tools, schools and families' ICT resources, the challenges that block the use of ICT tools by students, the importance that ICT tools have on the long life of students, the advantages that ICT tools can have on school activities, etc.

Interview sheets were consisted of open-ended questions about the use of ICT tools by pupils. They were asked to the school principals: They took part of this study because their answers enriched our research given their great responsibility in the school. However, parents and teachers are well aware of the level of students in this area in more detail. The interview sheets were composed of 2 sections: The first was focused on the names of schools, the gender, the age range and the level of study of respondents; and the second section of 8 questions. These questions were more focused on the importance of having knowledge of ICT tools in the school environment (whether for principals, teachers, parents, and especially students), the type of school ICT tools infrastructure, the challenges that block the use of ICT tools in the school environment, etc. It should be noted that whether for questionnaires or interview sheets, we have coded them to facilitate the analysis of the data: Number (N) + Questionnaire (Q) + School (S) + Parents (P), Principals (Pr) or Teachers (T).

3. Results and Discussion

Based on a descriptive statistic, SPSS (Statistical Package for Social Science) was used in order to facilitate the data reading and to lead to a good analysis and interpretation of them.

Thus, it properly analyze the data in accordance with the survey objectives, we wanted to get from the respondents some information related to the level of knowledge and use of ICT tools, the schools and families' ICT resources, and also the challenges that block the use of ICT tools by students. Regarding age range, gender, level of study, we have reserved this information for teachers and principals only. However, it should be noted that all the questionnaires and interviews sheets were completely anonymous. As mentioned in the previous section, parents' personal information was not collected, only teachers and principals' ones.

3.1. Gender Distribution of Respondents

It should be noted that in Democratic Republic of Congo, the female gender is not strongly represented in the teaching profession. This reality is verified in this paper: According to the data collected, the rate of gender is

not equal. Male represent 68% and female 32%. In addition to that, no teachers are under 20 years old, and almost half (46%) of the teachers and principals are between 51-60 years old. This proves that educators are very old. And it is in this age group that respondents are more oriented towards a traditional education system (use of chalk and blackboard, notebooks for data management and preparation of notes, etc.) instead of being assisted by ICT tools such as computer, screen projector, etc.

3.2 Level of study of respondents

According to Congolese law, having a bachelor's degree is the academic condition for being a principal (which is respected in our case). But, for teachers, with at least a state diploma you can get a job. For, 43% got a bachelor degree, 19% got an Undergraduate certificate; 38% got a State diploma certificate (High school certificate).

3.3. Skills in the use of ICT tools by respondents

In this section, all respondents were asked about their skills and knowledge of ICT tools. It is an issue of collecting the answers to the questions that we asked our respondents.

1. Among the 63 respondents (teachers and principals), 31 (49%) use a computer to manage data, while 32 (51%) do not use it.

2. Only on the teacher's side, 10 of them (17%) use the computer to prepare lessons, while 50 (83%) do not use it for that task; which represents the largest majority of teachers.

It's discovered that among the 50 teachers who do not use the computer to prepare the lessons: - 8 (16%) tell us that this is due to the fact that they are not used preparing lessons with a computer.

- 20 (40%) report that this is due to the fact that they do not have a computer.

- 8 (16%) tell us that this is due to the fact that they have not received any training on it.

- 14 (28%) report that this is due to the fact that the school does not have a computer to do so (the school has not integrated this system into their functions).

3. Among the 60 teachers, 32 (54%) claim to have been trained in the use of the computer, while 28 (46%) do not use it because they have not received any training.

What we discovered through this study is that among the 32 teachers who received training:

- 8(24%) were through a training program initiated by the school. It should be noted that the principals have reported to us that the computer lab is made available to teachers free of charge for more practice.
- 10 (33%) attended a paid training center

- 12 (38%) developed skills by themselves (self-taught)

- 2 (5%) tells us that it is thanks to a training program organized by the Ministry of Education.

In addition to that:

- 25 (41%) do not know how to use *Microsoft word*, 12 (21%) have poor knowledge of use, 12 (21%) have a

good (average) knowledge, 5 (8%) are very good at using, and 6 (10%) are excellent.

- 38 (63%) do not know how to use *Microsoft PowerPoint*, 9 (15%) have poor knowledge of use, 5 (8%) have a (good) average knowledge, 5 (8%) are very good at use, and 3 (6%) are excellent.
- 28 (47%) do not know how to use *Microsoft Excel*, 11 (18%) have poor knowledge of use, 9 (15%) have a (good) average knowledge, 6 (10%) are very good in use, and 6 (10%) are excellent.
- 25 (41%) do not know how to *research data through the internet*, 11 (18%) have poor knowledge of use, 12 (21%) have a (good) average knowledge, 6 (10%) are very good at, and 6 (10%) are excellent.
- 29 (48%) do not know how to use an *e-mail*, 11 (18%) have poor knowledge of use, 8 (13%) have a (good) average knowledge, 8 (13%) are very good at usage, and 5 (8%) are excellent.

4. On the parent's side, only 10 (23%) reported that they had difficulty using the computer, while 35 (77%) had no difficulty.

What we discovered through this study, is that among the 10 parents who find it difficult to use the computer, some told us that it is due to the lack of tools, some to the lack of training, and other it is due to irregular use which does not allow the concepts to be assimilated. All these reasons are also associated with that due to a classified scarcity of electricity to operate the tools. Despite the alarming finding, principals believe that teachers must be able to handle the computer. Because, in general, an intellectual who does not know how to use the computer today is illiterate: the use is not only a question of modernity, but especially to make the exercise of their functions less tedious (preparation of lessons, teaching, data management, etc.).

5. For their part, the teachers also consider that ICT is an added value in the exercise of their function. Among the 60 teachers:

- 20 (33%) consider it to be a tool which allows them to conform to modern teaching methods.
- 15 (25%) consider that this helps to prepare the lessons.
- 14 (24%) consider that it helps to do research on the internet.
- 11 (18%) see them as an important data management tool.

3.4. State of place of using ICT tools by students

During the data collection process, the respondents gave us their opinions regarding the importance of the use of ICT by students in their learning during and after school hours. Whether due to modernity, familiarity with the tools or even educational aid, unanimously we noticed that the respondents strongly encouraged this. In this section of this paper, we will detail the ICT infrastructures that are made available for students use, whether at school or at home, the time they spend in front of these tools, which tools are used, and also how they are useful to them. To get answers to this section, we had to ask the principals fairly specific questions regarding: the presence of computers in classrooms or in a computer lab and the availability of an internet connection. Thus, the 3 principals reported that the classrooms are not equipped with computers, but that the schools have a computer lab (this one does not have enough computer for a correct learning). Regarding the

internet connection, the STABLUM and BILOMBE primary schools are connected to a network, while the CARMEN SALES primary school is not.

It should be noted that ICT tools student use depended of one course to another. For that, among the 60 teachers:

- 31 (52%) report that the students do not spend any time in front of an ICT tool - 11 (18%), tell us that students often spend time there.
- 11 (18%) report that it is rare for him to spend time there.
- Only 7 (12%) report that contact is regular (always).

As mentioned above, the use of ICT by students is very important. According to our study, some parents have told us their views on the applicability of this crucial question in the lives of their children when they are at school.

At home, 31% of parents reported that the children had fairly regular contact when handling computers at school, while 69% thought the opposite. Among them, some reported that this is due to the fact that:

- There is a lack of resources (computer): the number of computers is not sufficient in relation to the number of students.
- The time in front of the computer is largely limited and insufficient: 45 to 50 minutes per week.

On the teachers' side, there are barriers that hinder the use of ICT by students in the classroom.

Some of them noted:

- Insufficient computers
- The low level of knowledge in the field, which directly impacts students' one.
- The categorical refusal of some teachers to transfer to the use of ICT in teaching and learning
- The scarcity of electricity.

Despite this fairly low rate, some teachers have reported some advantages that ICT has in student learning:

- In geography: the visualization of the whole globe in 3D, the visualization of the movements of the seas and other natural phenomena, the relief, etc.
- In geometry (or physics): the visualization of body volumes in 3D.
- In writing: learning to enter texts
- In anatomy (biology): the visualization of microorganisms, DNA.
- In history: the visualization of cultural objects, historical figures, the projection of historical documentaries.

In the same vein, we also addressed the question of the importance or the contribution of games (on the computer) in the process of learning and the use of ICT by students in school. Among the 60 teachers, 33 (55%) reported that this was an outright form of distraction for students (students are not allowed to play during school hours). However, the remaining 27 teachers (45%) reported that the games were useful. So:

- 28 (47%) of them told us that games allow students to familiarize themselves with tools (especially the computer)
- 24 (40%) reported that games (especially educational ones) open their minds and develop their ability to think scientifically.
- 8 (13%) reported to us that games are necessary for their development.

From what follows, we discovered through this study that among the 60 teachers, only 5 (8%) think that the use of ICT by students is not important at their age as a learning aid. They note in particular the fact that they will become dependent and will be stupid for tasks which can be done without a computer (calculation, writing, drawing.). Next to this statistic, the remaining 55 teachers (92%) say that with parental and teacher supervision, this will help the students immensely. Among these:

- 17 (31%) note that use boosts their intelligence
- 21 (38%) note that it is simply for reasons of modernity.
- 17 (31%) note that knowing how to use these tools makes them competitive in a highly computerized world.

3.5. Families' Situation

One of the important points of our study was to take stock of the use of ICT by students outside of school hours (at home).

It should already be noted that among the teachers questioned, some noted that parents have a very important role in the students' learning on this question; this amounts to saying that parents must also be on an almost equal level as teachers. This for 2 reasons:

- Parents are assistants in the education of children. They complement the teachers (response from 22 teachers out of 60)
- Parents must help children with homework through the use of ICT (answer from 38 teachers out of 60)

To get more details to this section, we had to ask parents fairly specific questions regarding: the presence of ICT tools at home (Computer, Phone, Tablets, DVD player) and also an internet connection. To the question of knowing which ICT tools the children use at home, on the 45 parents:

- 29 (64%) note that children only have the right to use the computer
- 45 (100%) allow their children to use only the phone
- 18 (40%) allow their children to use only tablets
- 21 (46%) of parents allow children to handle DVD players once.
- 7 (15%) of the parents authorize the use of all these ICT tools.

Regarding the presence of the internet connection at home, among the 45 parents, 13 (29%) reported to us that the house was not connected to the internet and 32 (71%) owned it. Of the 32:

- 29 (90.62%) use mobile data

- 1 (3.12%) a WiFI connection subscription - 2 (6.25%) use the 2 types of connection.

It should be noted that parents say that rigorous supervision must be put in place in order to control and help children when handling ICT at home. Of these, among the 45 parents:

- 43 (95%), report that ICT is only used for homework

- 34 (75%) allow children to use ICT only for games

- 33 (73%) allow children to use ICT only for social networks.

37 (82%) is for internet searches

- 24 (53%) allow children to use ICT only to watch movies

- 7 (15%) is for online training

- 6 (13%) use ICT to do all of these tasks.

4. Conclusion

The principal objective in this study was to establish an inventory of key aspects related to the use of ICT by primary pupils in Kinshasa both during and after class. We concluded that, on one hand, the only one ICT device used by pupils at school is the computer (2 of the 3 schools are connected to an internet network), on the other hand, the ICT devices used by pupils at home are Computer, Phone, Tablets and DVD player. It should already be noted that among the teachers questioned, some noted that families (parents) have a key role in the students' learning on this question; this amounts to saying that parents must also be on an almost equal level as teachers. This for 2 reasons:

- Parents are assistants in the education of children. They complement the teachers (response from 22 teachers out of 60)

- Parents must help children with homework through the use of ICT (answer from 38 teachers out of 60).

We also conclude that, despite the fact that the level of skills and knowledge of teachers in the use of ICT tools is relatively weak to allow students to receive good knowledge in the field, the trained teachers obviously allow students to have contact with ICT tools so that they assimilate them. At home, parents also provide ICT tools such as computers, phones, tablets and DVD players to children so that they can use them for proper assimilation. These ICT tools are used for homework, games, online research, online training, and also for watching movies.

As mentioned above, the study was limited to 3 primary schools, whose respondents are principals, teachers and parents. Knowing that the majority of primary schools and families in Kinshasa face the same problems, we could easily agree the fact those results can be extrapolated to many schools and families. This will be surely the next focus.

5. Recommendations

In order to materialize an effective use of ICT by students as tools to aid their learning, both during and after class, we offered these few simple recommendations that can be applied in the medium term. Firstly, we

should pay attention to the fact that the more the government invests in education, the stronger the education system becomes; and that should be take into consideration by all stakeholders.

Given the disparities in ICT tools in schools, not to mention the fairly high cost of the Internet, we believe that to create a partnership between telephone companies and the government to reduce the prices of computers and internet connection for primary public schools will be a necessary and important measure to materialize the use of ICT in class and at home;

Since electricity is a problem, not only for the price, but also because there is a lack of infrastructure; implement the use of almost free electricity in school (solar energy thanks to solar panels). with the same idea, smart Tablets with high battery life and solar-enabled chargers would transform the learning experience, both for teachers and students.

We have noticed that there is a lack of competence in terms of knowledge and use of ICT by teachers. This difficulty directly affects the quality of student learning and use of ICT, both at school and at home. Given this reality, we propose that school's principals must recruit teachers based on their skills and knowledge about ICT use. This previous recommendation should be based on a national policy. This is why the policy-makers of the education system must revise the Congolese education system according to the implementation of ICT in the school curriculum. In order to materialize these steps, the organization of conferences, workshops; seminars, and regular training sessions for all teachers on the use of ICT in teaching and learning will helpful in order to update their knowledge.

The reduction in the price of ICT tools to make available to students will allow them to materialize our approach, and this should not only benefit schools, but also parents of students. With that the promotion, the use of ICT at home especially for homework is very adequate in humane life.

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MANDA BENJAMIN KISIMBA holds an Oil Engineering degree (BSc.) from University of Kinshasa and a Postgraduate Diploma in Educational Management, Leadership and Policy at East China Normal University (Shanghai-China). He is a Master degree candidate in Education management (orientation: Educational Management, Leadership and Policy) at East China Normal University (Shanghai-China). His research interest focuses on the student's ability of using ICT both during and after class.