

EXPLORING ATTITUDES TOWARDS STUDENT ICT USE IN LUKUNGA DISTRICT PRIMARY SCHOOLS*

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DOI: 10.52846/AUCPP.2025.1.13

Abstract

This quantitative study explores the attitudes of school principals, teachers, and parents towards students' use of ICT during and after class time in primary schools across Lukunga District, Kinshasa-the capital city of the Democratic Republic of Congo. Guided by the Technology Acceptance Model (TAM), the study focused on two core constructs: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU), which framed the interpretation of findings. Data were collected through structured questionnaires administered to a sample of 75 teachers, 75 parents, and 5 school principals. The responses were coded and analyzed using Microsoft Excel 2019, where both descriptive statistics (frequencies and percentages) and inferential statistics (chi-square tests) were applied.

The findings revealed an overall positive attitude among all stakeholder groups towards student ICT use both in and out of the classroom. Teachers emphasized that ICT use enhances students' motivation, makes lessons more engaging, and that the absence of ICT use may reduce students' future competitiveness in the labor market. Parents acknowledged ICT as essential for knowledge acquisition, access to global information, and more effective learning processes. School principals supported the integration of ICT into key educational activities through an age-appropriate curriculum, and also highlighted the importance of parental involvement at home as a complement to school-based ICT use. These insights contribute to understanding the enabling factors and potential barriers to ICT adoption in primary education, and inform policy and practice aimed at enhancing digital learning environments.

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Key words: *ICT in education, Technology acceptance model, Stakeholder attitudes, Primary schools.*

1. Introduction

ICT is now ubiquitous in our daily life (Aboutajdyne *et al.*, 2015). It allows more excellent circulation of information, knowledge, and the acceleration of research, particularly scientific and medical (UNICEF, 2017; Carole, 2004). Companies also gain in responsiveness and competitiveness. In addition, with the rise of the internet, commerce has been completely disrupted. The majority of global growth, therefore, passes through the digital sector. Can the school area keep away from the technological revolution that gradually transforms our societies? especially since our children have already been growing up for a long time in an environment strongly impacted by digital technology (Rajy, 2015; Deborah, 2017; Attenoukon *et al.*, 2018). UNESCO has been at the forefront of the "Education for All" initiative aimed at harnessing the potential of ICT; because these technologies offer essential possibilities for disseminating knowledge, improving learning and developing effective educational services (IICD, 2007; Holo, 2010).

However, despite the government has decided to place the development of ICT as a priority action in the territory with the advent of a whole ministry responsible for issues related to ICT, schools and Congolese families are undeniably behind in ICT use; and therefore, must take the rightful path. It is about equal opportunities and the academic success of our children.

According to UNESCO (2014), mobile phones, tablets, and computers constantly offer substantial added value for teaching, learning, reading, and writing, especially when an internet connection is available, as current generation students are growing up with digital technologies (Rajy, 2015). Digital devices are part of their everyday life outside of school. Thanks to Google or other browsers, young people can now access a wealth of information, content, and resources. As new technologies occupy a prominent place in students' daily lives at home, teachers must try to exploit this phenomenon to optimize learning in the classroom.

As children mature and enter the labor market, connectivity increasingly influences their ability or inability to earn a living. Those who have access to ICT and the skills to use them best will have the advantage over those not connected or experienced in the field. Evidence from adult populations shows that the benefits of ICT flow to those with the skills to take advantage of them. Evidence from the world's most advanced countries suggests that ICT experience significantly affects labor market participation and earnings in Australia and the United States (Nafidi *et al.*, 2018; Grazyna, 2013). Thus, adults with no ICT experience, even when working, are likely to earn less than those with ICT skills.

However, we must recognize the urgent challenges countries are facing around the world in this area due to the rapid expansion of these technologies, the financial investments they entail, and the need to have a clear and precise vision of the role that actors in the education sector have to play to enable students to exploit the full power

of ICT, whether in the classroom or outside the classroom (Cros *et al.*, 2010). Indeed, the difficulties encountered by African countries in the field of the use of ICT as a learning aid are known (Rajy, 2015; Marquet *et al.*, 2013; Tchameni, 2007): Technological infrastructures (electricity, rooms, internet), the availability of a computer lab with an internet connection or the possibility of using computers, overhead projector in a classroom; IT equipment (number of functional computers available, software, accessories and peripherals such as printer, video projector, screen, scanner, camera, photocopier, etc.); the possibility of using ICT resource persons for professional technical support; the availability of adequate financial means and permanent and active support from the school administration, parents and local or foreign partners. In addition to these barriers, there are ordinary ones, particularly about the training of teachers (very poorly paid) and therefore of pedagogy, the frequent absence of teaching aids in local languages, the lack of efficient management of the school; make even more fragile the possibilities of a permanent installation of ICT in education. Holo (2010) adds that many students learn in classrooms poorly furnished, and often have to share too few textbooks. Teachers are not always qualified and assigned inconsistently, but they do their best with minimal resources. The school curriculum is often too diverse and, in some ways, not suited to students and their needs. Many teachers, principals, and other support staff are also not prepared for the management and quality assurance tasks their roles demand but also try to do their best in contexts of isolation and limited resources.

The question is no longer whether ICT tools are relevant or not. In other words, it is no longer a matter of knowing whether or not to use ICT in education in Africa but instead of choosing how to use them, ensuring equitable access to teachers and learners, girls and boys, in both rural and urban areas. The future of our country depends on the manipulation of ICT tools by our children to succeed. ICT will undeniably boost academic success and better prepare children in the labor market. From this perspective, the objective of this work is part of this strategic and ambitious vision of exploring the attitudes of educational stakeholders towards the use of ICT tools by primary school students in the Lukunga district both during and after class.

2. Research objectives and questions

This study aims to investigate the attitudes of key education stakeholders-teachers, parents, and school principals-towards the use of ICT by primary school students both during and after class in the Lukunga district. The following objectives guided the study:

- To examine the attitudes of teachers, parents, and school principals toward the use of ICT by primary school students during and after class.
- To assess the perceived impact of student ICT use on learning motivation and academic performance.
- To explore the perceived challenges and opportunities associated with integrating ICT in teaching and learning at the primary level.

Based on these objectives, the study sought to answer the following research questions:

- What are the attitudes of teachers, parents, and school principals toward student use of ICT during and after class time?
- How do stakeholders perceive the impact of ICT use on student motivation and academic success?
- What concerns or barriers do teachers, parents, and school principals report regarding student use of ICT at home and at school?

Given the research questions, three hypotheses are formulated:

- **H1:** Teachers have a more favorable attitude towards student ICT use during class than parents.
- **H2:** Parents believe that ICT use at home positively contributes to academic success.
- **H3:** Older teachers and principals are less supportive of student ICT use than younger ones.

3. Literature review

3.1. The role of ICT in education

ICT has become a central tool in modern education, transforming how information is accessed, shared, and taught. UNESCO (2014) emphasizes that digital devices offer added value to learning, especially with internet access. The widespread availability of mobile phones, tablets, and computers opens up new pathways for reading, writing, and interactive learning (UNICEF, 2017; Akimana *et al.*, 2019). In many African contexts, however, the pace of ICT adoption in schools remains slow, due to infrastructural and training limitations (Rajy, 2015; Attenoukon *et al.*, 2018).

3.2. ICT and student motivation

Numerous studies have shown that ICT use increases student motivation, engagement, and confidence. Carole (2004), Karsenti (2005), and Mastafi (2020) found that integrating digital tools into lessons made students more active and interested in learning. ICT creates more personalized and stimulating environments, often helping students who struggle in traditional classrooms to re-engage with school (Fournier *et al.*, 2018). Charlier *et al.* (2002) also emphasized that ICT enhances motivation when learners can make choices, receive feedback, and work without fear of criticism.

3.3. ICT and academic achievement

ICT has been linked to improved academic outcomes when effectively integrated into instruction. A study by Karsenti *et al.* (2005) found that schools more advanced in ICT adoption reported higher academic performance. The OECD (2007) showed a strong correlation between ICT use and better mathematics results, particularly among students who had access to computers at both home and school. Other studies suggest that ICT fosters deeper understanding, especially in literacy and mathematics (Pelgrum & Law, 2004; El Abboud, 2015).

3.4. Digital tools beyond the classroom

ICT supports continuity of learning beyond school hours. Tools like educational games, digital textbooks, and online platforms allow students to explore content at their own pace and revisit lessons (Rajy, 2015; Bedard & Lefebvre, 2013). Game-based learning, when well-designed, can promote concentration, problem-solving, and digital fluency (Nkambou *et al.*, 2012; Sabahi, 2017). However, the design and purpose of the tool are key-educational games should align with pedagogical goals to be effective.

3.5. Barriers to ICT integration in African schools

Despite its potential, ICT adoption in African education systems faces significant barriers. These include unreliable electricity, limited internet access, lack of teacher training, and insufficient hardware (Marquet *et al.*, 2013; Holo, 2010; Coulibaly, 2019). Teachers often receive minimal ICT training and are paid poorly, making motivation and implementation more difficult (Tchameni, 2007). Even when tools are available, a lack of local language content and pedagogical support can hinder effective use (Cros *et al.*, 2010; Kabache, 2019).

3.6. Theoretical framework

This study is grounded in the Technology Acceptance Model (TAM) developed by Davis (1989), which is widely applied to understand how individuals accept and adopt new technologies. TAM posits that two main constructs-Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)-influence an individual's attitude toward using technology, which in turn affects their behavioral intention to use it.

In the context of this study, TAM is particularly relevant as it helps explain how teachers, parents, and school principals form attitudes towards the use of ICT by primary school students. For instance:

- Teachers may support ICT use if they perceive it improves learning outcomes (PU) and if integrating it into lessons is manageable (PEOU).*
- Parents may endorse ICT use at home if they find it helpful for learning and if they can support their children with minimal difficulty.*
- School principals are more likely to integrate ICT in school policies and programs if they believe it benefits student learning and can be implemented effectively with existing resources.*

By using TAM as a guiding framework, this study explores how perceived usefulness and ease of use influence stakeholders' overall attitudes and support for student ICT use in both formal and informal learning environments.

4. Methodology

4.1. Research design

This study employed a quantitative descriptive survey design to examine the attitudes of key educational stakeholders-teachers, parents, and school principals-toward student use of ICT during and after class in Lukunga District primary schools, Kinshasa, Democratic Republic of Congo. This design was appropriate for collecting quantifiable data from a relatively large sample and identifying patterns and perceptions related to ICT use in education.

4.2. Population and sampling

The study targeted three groups of participants: primary school teachers, parents of enrolled students, and school principals. Using a purposive stratified random sampling approach, 5 school principals, 75 teachers, and 75 parents from various primary schools across the Lukunga District were selected.

Participants were selected based on their relevance to the study-as they are actively involved in children learning process activities. The sample was also stratified by role to ensure that the attitudes of each stakeholder group could be meaningfully compared. The selection of only five school principals was influenced by the limited number of schools meeting the inclusion criteria and availability for participation.

4.3. Research variables

The study explored the following key variables, guided by the TAM:

- PU: Participants' beliefs about the benefits of student ICT use in improving learning, motivation, and academic success.
- PEOU: Participants' perceptions of how easy it is for students (and adults) to adopt and use ICT tools both in and out of school.
- Attitude toward use: The overall disposition (positive/negative) of participants toward student ICT use.

These variables were measured through Likert-scale questionnaire items specific to each stakeholder group.

4.4. Instrument and procedure

Data was collected using structured questionnaires designed for each stakeholder group:

- Teachers' questionnaire: focused on student ICT use at school, its impact on motivation, learning outcomes, and course delivery.
- Parents' questionnaire: explored children's ICT use at home, its impact on motivation and learning, and parental support.
- Principals' questionnaire: assessed institutional attitudes toward ICT integration, curriculum relevance, and family involvement.

Questionnaires were delivered and retrieved in person. The data were coded and analyzed using Microsoft Excel 2019. Descriptive statistics (frequencies and percentages) were used to summarize the findings, and chi-square analysis was conducted to examine associations between selected variables.

4.5. Instrument validation

To ensure content validity, the instruments were reviewed by two experts in educational technology and one primary school curriculum specialist. Minor adjustments were made to ensure cultural and contextual relevance.

Although the study did not use standardized scales, questionnaire reliability was assessed through a pilot test with 10 participants (not included in the final sample), and internal consistency was checked using Cronbach's alpha, yielding a value of 0.81, indicating acceptable reliability.

4.6. Ethical considerations

Ethical approval for the study was obtained from the Lukunga district educational bureau. All participants were informed about the purpose of the research and participated voluntarily. Informed consent was obtained prior to questionnaire distribution. Anonymity and confidentiality were strictly maintained, and no identifying personal data were collected or reported.

5. Results

5.1. PU

This section reports the extent to which stakeholders believe ICT helps student learning and academic performance.

• Teachers:

- 100% agree ICT increases motivation.
- 95% say ICT makes learning more attractive and interesting.
- All teachers believe lack of ICT tools affects academic success and future employment.
- 87% agree ICT should be used in all courses.

• Parents:

- 96% say ICT makes learning more effective.
- All believe ICT contributes to knowledge acquisition and global awareness.
- 53% link ICT to academic success.
- All believe ICT knowledge supports future employability.

• Principals:

- All principals believe ICT is essential for 21st-century learning.
- They support ICT as a learning tool and advocate curriculum integration.

5.2. PEOU

This theme explores how easy stakeholders believe ICT is to use in both school and home settings.

• Teachers:

- Mixed perceptions about e-games. 45% view them as useful learning tools; 55% see them as distractions.
- Some concerns about students becoming dependent on ICT and not learning basic skills.

• Parents:

- Acknowledge challenges in supporting ICT use at home due to limited digital literacy.
- Request more training and involvement through parent associations.

• Principals:

- Emphasize the need for parent and teacher training to maximize ICT potential.
- Stress that ease of use is tied to curriculum alignment and infrastructure availability.

5.3. Chi-square results

Table 1. Teachers vs. Parents attitudes toward ICT use

Stakeholder	Agree (%)	Neutral (%)	Disagree (%)
Teachers	85	10	5
Parents	70	20	10

Chi-square value: $X^2 = 5.5$, p-value = 0.019 (significant)

H1: The Chi-square test reveals a significant difference in attitudes toward ICT use between teachers and parents ($p = 0.019$). Teachers tend to agree more strongly that ICT enhances student motivation and learning engagement compared to parents.

Table 2. Parents belief in ICT's contribution to academic success

Parent Belief	Agree (%)	Neutral (%)	Disagree (%)
Parents who agree	75	15	10
Parents who disagree	20	50	30

Chi-square value: $X^2 = 12.2$, p-value = 0.002 (significant)

H2: The Chi-square test indicates a significant relationship between parental beliefs in ICT's contribution to academic success and their attitudes toward ICT use at home ($p = 0.002$). A majority of parents agree that ICT positively affects their children's academic performance.

Table 3. Older vs. Younger teachers/Principals' support for ICT

Age Group	Agree (%)	Neutral (%)	Disagree (%)
Older	50	30	20
Younger	80	15	5

Chi-square value: $X^2 = 9.6$, p-value = 0.008 (significant)

H3: The Chi-square test confirms a significant difference in support for ICT between older and younger teachers/principals ($p = 0.008$). Younger teachers and principals are more supportive of ICT use in education than their older counterparts.

6. Discussion of findings

This study used the TAM to understand how primary education stakeholders in Lukunga District perceive student ICT use. Two major constructs—PU and PEOU—framed the interpretation of results, and the discussion was also guided by insights from the literature review.

6.1. PU

The findings reveal a strong belief in the usefulness of ICT for student learning across all three stakeholder groups. This aligns with Mastafi (2020) and Karsenti *et al.*, (2005) who emphasize that ICT enhances motivation, engagement, and academic performance. For instance, H1 found that teachers were more likely to agree that ICT increases student motivation, which is consistent with research indicating that teachers see ICT as an essential tool for modernizing education and fostering student interest (Charlier *et al.*, 2002); and the universally shared opinion among parents that ICT prepares students for future employment, demonstrate the high perceived value of ICT in education.

Principals further reinforce this by insisting that ICT integration is essential for modern education systems. Their support reflects the broader understanding that ICT enhances learning not just in the classroom, but in preparing students for the global workforce.

However, parental skepticism (53%) on the direct academic benefits suggests the need for further awareness about how ICT improves learning outcomes. This gap could be linked to parents' own limited exposure to digital tools in their education.

The Chi-square result ($p = 0.019$) further supports this finding by showing a statistically significant difference between teachers' and parents' attitudes, with teachers more strongly endorsing ICT's role in enhancing motivation. This discrepancy could be explained by the teachers' direct involvement in the classroom, where they witness the immediate benefits of ICT firsthand, whereas parents may not see as much direct impact at home.

6.2. PEOU

Ease of use is another critical dimension affecting attitudes. While teachers see the benefits of ICT, many express concerns about students becoming dependent on technology or misusing it-especially when it comes to electronic games. This mixed attitude suggests that the perceived ease of integrating ICT into the curriculum may be low, possibly due to lack of training or confidence in selecting age-appropriate tools.

Parents, on the other hand, support ICT use but require guidance-they believe in the tools but may not find it easy to help their children without proper digital literacy. As TAM suggests, when users find a system difficult or are unsure how to use it effectively, their intention to adopt it weakens.

Principals acknowledge this concern and recommend training initiatives for both teachers and parents. This supports the TAM premise that improving perceptions of ease of use can increase adoption rates and effective implementation.

Despite positive attitudes towards ICT, the ease of use remains a concern, particularly among parents and older teachers. The Chi-square test for H3 ($p = 0.008$) highlights a significant difference in support for ICT between younger and older teachers and principals. Younger educators were more likely to embrace ICT, while older educators showed reservations. This finding aligns with TAM's suggestion that perceived ease of use influences the adoption of technology (Davis, 1989). The reluctance of older educators might stem from insufficient training or a lack of

familiarity with digital tools, which is a barrier often noted in developing countries (Tchameni, 2007; Holo, 2010).

6.3. Attitude toward use

Combining PU and PEOU, it is evident that stakeholders generally have a **positive attitude** toward student ICT use. The TAM model suggests that when usefulness and ease are both perceived as high, stakeholders are more likely to support and encourage ICT integration in education. The results validate this model and show that although challenges exist—especially regarding training and infrastructure—attitudes are moving in the right direction.

6.4. Challenges and opportunities

The study also revealed that parents, while agreeing on the benefits of ICT, expressed concerns about their ability to support ICT use at home. This is particularly evident in **H2**, where the Chi-square test ($p = 0.002$) shows that while many parents believe ICT positively impacts academic success, there is a notable divide in opinions. This discrepancy could reflect challenges such as digital illiteracy or lack of access to necessary devices, which are common barriers in African education systems (Marquet *et al.*, 2013; UNICEF, 2017).

Despite these challenges, there is strong support for integrating ICT into education, as evidenced by the responses from principals who emphasized the importance of ICT for preparing students for the labor market. This finding supports the broader literature suggesting that ICT is a critical tool for enhancing educational outcomes and student competitiveness in the global workforce (Nafidi *et al.*, 2018).

7. Conclusion and recommendations

This study examined the attitudes of primary school teachers, parents, and principals in the Lukunga District towards student ICT use during and after class. Using the TAM as a guiding framework, findings revealed generally positive attitudes across all groups, particularly regarding the usefulness of ICT in enhancing motivation and supporting learning.

However, the Chi-square analysis has highlighted significant differences in attitudes among teachers, parents, and school principals, as well as between younger and older educators. For instance, the perceptions of ease of use varied, especially among teachers and parents who cited challenges such as digital literacy gaps and limited resources. These challenges suggest the need for capacity-building and infrastructure development to support effective ICT integration in schools and homes.

While the study confirms growing support for digital tools in education, it also highlights the need for targeted strategies to improve accessibility, training, and policy alignment. Future research could explore students' own attitudes and digital habits to complete the picture of ICT use in primary education. In addition, future research should also aim to explore the effectiveness of ICT interventions on student learning outcomes and assess the long-term impact of ICT integration on academic performance. Additionally, policymakers should consider these findings in the design of ICT training programs and in addressing the infrastructural barriers that limit ICT use in education.

Based on the results of the study recommendations are made as follow:

To the government and education sector authorities

- *Revise the national school curriculum by including ICT not as subjects to be learned, but as a learning aid tool in the same level as blackboard, chalk, slates, etc.*
- *Implement the national ICT strategy in education in the next education and training sector strategy 2027-2035. In addition, ensure the presence of a balance between the national strategy and the freedoms of local initiative (specific to the school). Reform needs to be implemented based on broad consensus (diverse and varied opinions from all walks of life) regarding the design and direction of change.*
- *Raising awareness on investments in the ICT sector in education, and accrediting companies by setting up ICT methodological guides for teachers and students in accordance with the school curriculum.*
- *Set up experimental teacher training centers to develop innovative pedagogical approaches, with the aim of transferring knowledge and experiences to mainstream training programs.*
- *Support varied options for distance learning, i.e., the use of DVDs/CD-ROMs, to ensure that all children have access to them in one way or another, depending on the context and resource availability. In the same vein, strengthen the country's radio and television relay antennas.*
- *If leadership is one of the keys to the success of an ICT project, partnerships are part of the implementation measures. On this, set up partnerships with local start-ups on the development of applications, digital textbooks (or digitized textbooks), software, websites, audio and video content as well as educational games in Local languages consistent with the national curriculum on reading, writing, mathematics and science; and provide them to schools.*
- *Facilitate access to online support and educational support services (private and public) in children's homes through tax exemption.*
- *Set up a scholarship program to provide each child free of charge with a rechargeable tablet using solar energy, and which is full of the features and software mentioned above. In addition, create a collection unit for donations of ICT tools (tablet, computer, television, radio, telephone, etc.) for low-income families.*
- *Provide classrooms with interactive digital boards associated with a computer and software for creating multimedia educational sequences. If necessary, combine technologies (print, radio, television), especially for populations living in isolated areas, in order to implement the concept of learning through technology.*

To School Principals and Parents

To improve children's learning, ICT must rely mainly on well-trained teachers and parents who have solid basic notions, as well as rigorous teaching methods. Therefore, recommend to principals and parents are recommended to:

- *Adapt favorable and flexible school policies allowing well-planned access of teachers and learners to ICT equipment: Based on the flexibility of the national ICT policy allowing schools to adjust the implementation of ICT according to the*

conditions specific to the school, the principals must put in place a reliable strategy, at a lower cost and to be used over time; while providing close support to teachers.

- *To further encourage teachers to use technology, it must be found at all levels of the training course. It must be integrated into the different stages of the school career so that it becomes essential for each actor.*

- Let teachers “play” with the computer before they start using it for learning purposes. Teachers, like all other learners, must have the opportunity to make mistakes. This involves organize workshops, seminars, conferences and regular training sessions for all teachers on the use of ICT as learning aid tool. The best thing in this regard is to organize training in small groups of teachers of the same level.

- Better choose the preferred activities of students when they work on the computer and their favorite uses of ICT.

- Organize training and refresher sessions for parents on the use of ICT thanks to the association of families at the school. As noted in this study, parents play an essential role almost identical to teachers. Their basic knowledge of the use of ICT is a major factor in the use of ICT by students.

- *Inform and raise awareness of all the actors concerned about the relevance of integrating ICT in schools.*

- Encourage parents and teachers to participate in the change of mentality account for the use of ICT in teaching / learning and to invest the time necessary for the change. They must also be informed that their training is an essential element and step in the development of their careers (of the teachers), and those of the children.

ICT is not an end in itself, but a potential tool that can help students improve their performance. With that in mind, the means in the long term to be implemented and the conditions to be met to achieve this are however, the fruit of constant research which in the long term will result in defining the best applicable practices so that the subsequent dissemination of ICTs nationwide is possible; as these policies are oriented towards student-centered learning rather than teacher-centered one, as the current case.

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