

# The Impact of Socio-Economic Inequalities in ICT on Students' Motivation and Academic Achievement at Jean Lorougnon Guédé University (UJLOG), Daloa, Côte d'Ivoire

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## Abstract

This study explores the use of Information and Communication Technologies (ICT) among students at Jean Lorougnon Guédé University (UJLOG), with particular emphasis on the socio-economic disparities that affect both access to and usage of these technologies. We have thus analyzed the impact of socio-economic inequalities related to ICT on students' motivation and academic success. Our objectives were to examine how students use ICT in their learning processes, to analyze the relationships between ICT usage, motivation, and academic achievement, to identify the socio-economic disparities that may exist among students in terms of access to digital resources and the internet, and to propose recommendations aimed at improving access to digital tools and reducing inequalities among students. The questionnaire proved instrumental in collecting quantitative data for this research. The data revealed that while students are generally well-equipped with technological devices, significant disparities remain in terms of access to digital resources and internet connectivity at home—issues that warrant particular attention. These inequalities can affect both student motivation and academic success, particularly among those from socio-economically disadvantaged backgrounds. The findings suggest that educators and institutions should take these disparities into account in order to expand access to digital resources and reduce the gap between students. This research carries important implications for education and learning, highlighting the need to raise awareness about the value of digital tools and to foster the development of students' digital competencies.

## Keywords

Information and Communication Technologies (ICT), Socio-Economic

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## Inequalities, Access to Digital Resources, Student Motivation and Academic Success, Teaching and Learning

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### 1. Introduction

Information and Communication Technologies (ICTs) have profoundly transformed teaching and learning practices. In Côte d'Ivoire, ICTs exert a significant influence on students, particularly in their learning processes. A study conducted by Holo, A. K., Koné, T., & Saha, K. B. (2021) revealed that students at the Virtual University of Côte d'Ivoire (UVCI) make extensive use of digital platforms and social networks (WhatsApp, Google, YouTube, Facebook), both to access course-related resources and to employ them as spaces for collaboration and collective work. However, despite the numerous advantages that ICTs provide, they also risk exacerbating pre-existing socio-economic inequalities among students. Indeed, access to digital resources and internet connectivity remains uneven, largely depending on students' socio-economic background. This situation generates disparities in access to information, educational resources, and learning opportunities. The present study, conducted with 672 students enrolled in both face-to-face and distance learning programs (Formation Présentielle and Formation Ouverte à Distance—FOAD) at Jean Lorougnon Guédé University (UJLOG) in Côte d'Ivoire, aims to analyze the relationships between learners' age, choice of learning mode, ICT usage, motivation, and academic achievement, while taking into account the socio-economic inequalities likely to shape these dynamics. Specifically, the study seeks to examine how students mobilize ICTs in their learning, to assess the role of these technologies as a motivational factor, and to explore the impact of socio-economic disparities on access to digital resources and academic success. In order to test our hypothesis—namely, that students with better access to ICTs demonstrate higher levels of motivation and academic achievement than those with limited access—we sought to determine whether socio-economic inequalities exert a significant influence on access to digital resources and internet connectivity, and whether such access, in turn, impacts students' academic outcomes.

It is therefore essential to understand not only how students mobilize ICTs in their learning processes but also how socio-economic disparities condition their use. From this perspective, the present study seeks to address the following research questions:

- ✓ How do students use ICTs for their learning?
- ✓ In what ways can ICTs serve as a motivational lever for students?
- ✓ How do socio-economic disparities influence access to digital resources and students' academic achievement?

To effectively address these issues, we begin by outlining the theoretical, methodological, and conceptual framework of the study. We then describe the research

methodology employed, before presenting and interpreting the major findings.

## 2. Theoretical, Methodological, and Conceptual Framework

### 2.1. Theoretical Framework

Our study is grounded in a theoretical framework that integrates the theories of connectivity, situated learning, self-efficacy, motivation, and the digital divide, in addition to scholarly work on the use of Information and Communication Technologies (ICT) in education and training.

Indeed, [Siemens' \(2005\)](#) Connectivism Theory highlights the importance of connection and networking in learning. Students with access to digital resources and the internet can participate in a broader community of learners, thereby fostering skill development and enhancing their motivation. Within the context of our study, this suggests that UJLOG students with such access benefit from a collaborative and stimulating learning environment.

In the same vein, [Lave and Wenger's \(1991\)](#) Situated Learning Theory emphasizes the decisive role of context and environment. ICT use, by allowing students to engage in learning activities closely aligned with real-life situations, becomes a crucial lever for acquiring practical skills and improving academic success. Our findings corroborate this, indicating that UJLOG students who integrate ICT into their learning processes develop more practical competencies and increase their chances of success.

Furthermore, [Bandura, A.'s \(1997\)](#) self-efficacy theory provides a complementary perspective. It highlights that individuals' belief in their own capabilities significantly influences both their motivation and performance. Thus, students who perceive themselves as capable of effectively using ICT for educational purposes are more likely to persist and succeed, whereas those who doubt their abilities are at greater risk of demotivation. Our observations align with this notion: at UJLOG, students with a positive perception of their digital skills demonstrate better academic outcomes.

Moreover, [Ryan and Deci's \(2000\)](#) motivation theory emphasizes the importance of intrinsic motivation and autonomy in learning. According to this framework, three fundamental psychological needs—autonomy, competence, and relatedness—are essential to fostering motivation and well-being. Applied to our study, this theory helps explain why UJLOG students who have access to digital resources and are able to use them autonomously and competently are more likely to engage actively and succeed in their academic endeavors.

Finally, it is essential to consider the *theory of the digital divide* advanced by [Norris, P. \(2001\)](#), which sheds light on persistent inequalities in access to digital resources and the internet. Unlike their peers with adequate access, students deprived of such tools face significant disadvantages, both in terms of motivation and achievement. Our findings confirm this reality: UJLOG students without regular access to ICT are indeed less advantaged than their better-equipped counterparts.

## 2.2. Methodological Framework

The methodological framework adopted for this research is based on a quantitative and descriptive approach. This methodological choice is justified by the intention to rigorously, precisely, and objectively examine the impact of socio-economic inequalities on the use of Information and Communication Technologies (ICT) and on the motivation of students at Jean Lorougnon Guédé University (UJLOG). The quantitative approach enables the measurement and statistical analysis of observed phenomena, while the descriptive and correlational dimensions of the study allow, on the one hand, for a detailed depiction of students' digital practices, and on the other hand, for the exploration of the relationships among the variables under investigation.

To achieve the research objectives, the target population consisted of 672 students, selected from a total of 710 participants in the survey. These students were drawn from the five Training and Research Units (UFR) and represented two distinct modes of study: face-to-face training and open and distance learning (ODL). This sample, which accounts for nearly 95% of the initial population, ensures satisfactory representativeness and diversity of student profiles, thereby providing a clearer understanding of ICT use within UJLOG. According to [Krejcie, R. V., & Morgan, D. W. \(1970\)](#), a sample of this size can be considered representative of a population of 10,000 students, with a 95% confidence level and a 5% margin of error. Consequently, our sample size is sufficiently large to yield reliable and generalizable results for the population under study.

Data collection was carried out using two complementary instruments: 1) online questionnaires, designed to facilitate the participation of a broad number of students, and 2) paper-based survey forms distributed directly on campus over a period of approximately one week. This dual data-collection strategy offers the advantage of reaching both students with regular access to digital tools and those more dependent on paper-based formats. It also strengthens the reliability and comprehensiveness of the information gathered regarding ICT use and student motivation.

Finally, data analysis was conducted using appropriate and well-established statistical tools in the social sciences. Descriptive statistics were employed to highlight general trends, while inferential and correlational analyses were performed to test the relationships among variables. More specifically, mean comparison tests (Student's *t*-test and analysis of variance [ANOVA]) and Pearson correlation coefficients were applied. All analyses were conducted using JAMOVI and Microsoft Excel, chosen for their accessibility, efficiency, and capacity to produce reliable results. This rigorous methodological approach allows us to objectively account for the characteristics of ICT use among students and to identify significant relationships between socio-economic inequalities, motivation, and academic achievement.

### Variables and Research Objectives

Within the framework of this study, we identified a set of key variables likely to

significantly influence ICT use and, consequently, students' academic achievement. These variables include age, choice of study mode (face-to-face or distance learning), effective use of ICT, level of motivation, academic success, socio-economic status, and access to digital resources. The complexity of the interactions among these variables warrants particular attention, as each may exert a direct or indirect influence on the others. For instance, students' age may shape their choice of study mode, which in turn can determine their relationship with ICT and their level of motivation.

The objectives of this study are structured around the exploration of these complex interrelationships. First, the study seeks to describe students' ICT use while taking into account their demographic and socio-economic characteristics, thereby providing a comprehensive and nuanced overview of digital practices at Jean Lorougnon Guédé University. Second, the study aims to examine the relationships among ICT use, motivation, and academic success, three interdependent dimensions that are central to the learning process. Furthermore, we analyze the links between age and choice of study mode, as well as between socio-professional status and type of study program, in order to highlight contextual factors that may shape students' academic trajectories.

Another major objective of the study is to identify socio-economic disparities that translate into unequal access to and use of ICT. By highlighting these disparities, we seek to better understand the specific obstacles encountered by certain students, particularly those from disadvantaged backgrounds. This step is essential to apprehend the real conditions under which students pursue their studies and to assess the extent of digital inequalities in higher education.

Finally, based on the findings, we aim to formulate concrete and evidence-based recommendations to improve access to digital resources and reduce gaps between students. These recommendations will be grounded in an in-depth analysis of the collected data and will aim to foster more equitable and effective use of ICT in higher education. Through this study, we aspire not only to contribute to a better understanding of the key determinants of academic achievement but also to propose actionable strategies to strengthen digital inclusion and promote equal opportunities in access to education.

## **2.3. Conceptual Framework and Model**

### **2.3.1. Conceptual Framework**

The conceptual framework of this study draws upon a set of fundamental concepts that help to better understand the relationships between the use of Information and Communication Technologies (ICT) and students' academic achievement. ICT, understood as the collection of tools and systems that facilitate communication, information gathering, processing, and dissemination, encompasses a wide range of devices such as computers, mobile phones, tablets, social media, and online learning platforms. Their increasing integration into higher education has made ICT a pivotal lever for learning and academic performance.

Moreover, learners' age emerges as an important variable likely to influence

both ICT use and motivation to learn. Younger students, often described as *digital natives* (Prensky, 2001), tend to be more familiar with and comfortable using digital technologies than their older peers. Similarly, the choice of study mode constitutes another determining factor: the pedagogical modalities inherent in face-to-face versus distance learning (FOAD) not only shape the frequency but also the quality of ICT use, thereby directly influencing academic achievement.

In addition, ICT use refers to the various ways in which students employ these tools in their academic and personal activities. This includes, for example, searching for information, communicating with instructors and peers, as well as producing and submitting academic assignments. However, such use is not homogeneous: it depends on students' level of technological proficiency, as well as their ability to integrate ICT as a genuine support for learning (Anderson, 2010).

Closely connected to ICT use, motivation represents a critical factor in academic engagement and success. According to Ryan and Deci's (2000) self-determination theory, students who perceive ICT as a means of autonomy and personal growth are more likely to actively engage in their studies. In this study, motivation specifically refers to students' willingness to utilize ICT in ways that support and enrich their academic activities.

Furthermore, academic achievement can be assessed through students' performance and their ability to appropriate the tools and methods necessary to reach their educational goals. Effective use of ICT, when combined with strong motivation and adequate access to resources, can significantly enhance academic success (Tinto, 2012).

Finally, it is essential to account for socio-economic status and access to digital resources. Socio-economic status, encompassing dimensions such as household income, parental education, and social and cultural capital, directly shapes students' conditions of access to ICT. In this regard, Norris, P. (2001) highlights in his work on the *digital divide* that students from disadvantaged backgrounds often have fewer means to access digital tools and platforms. Complementarily, access to digital resources—including computers, smartphones, stable internet connectivity, and online learning platforms—conditions the effective use of ICT and, consequently, its potential impact on academic achievement.

Taken together, these variables—age, study mode, ICT use, motivation, academic achievement, socio-economic status, and access to digital resources—constitute the foundation of the conceptual framework of this study. Their joint analysis makes it possible to better apprehend the complex dynamics shaping students' experiences and determining their academic success in higher education.

### 2.3.2. Conceptual Model

The conceptual model of this study may be represented as follows:

**Learners' Age → Choice of Study Mode → Socio-Economic Status → Access to Digital Resources → ICT Use → Motivation → Academic Achievement**

This model suggests that learners' age may influence their choice of study mode.

Socio-economic status then affects access to digital resources, which in turn shapes ICT use. ICT use subsequently impacts both motivation and academic achievement, while motivation itself also directly influences academic achievement.

### 3. Presentation of Results

#### 3.1. Summary of the Study Participants' Profile

**Table 1** presents the profile of the study participants, whose average age is 31 years, comprising 64% male and 36% female students. The distribution across study levels is as follows: Bachelor 1 (35.71%), Bachelor 2 (18.45%), Bachelor 3 (32.74%), Master 1 (5.95%), and Master 2 (7.14%). The majority of participants are single (86.16%) and are primarily non-employed students, accounting for 87.80% of the sample.

**Table 1.** Summary of the study participants' profile.

Variables	Categories (Years)	Frequency	Percentage
<b>Age</b>			
	<18	30	4.46%
	18 - 21	302	44.94%
	22 - 25	250	37.20%
	26 - 35	48	7.14%
	36 - 45	30	4.46%
	45+	12	1.79%
<b>Gender</b>			
	Male (M)	430	63.99%
	Female (F)	242	36.01%
<b>Level of Study</b>			
	Bachelor 1	240	35.71%
	Bachelor 2	124	18.45%
	Bachelor 3	220	32.74%
	Master 1	40	5.95%
	Master 2	48	7.14%
<b>Marital Status</b>			
	Cohabiting	41	6.10%
	Single	579	86.16%
	Married	52	7.74%
<b>Employment Status</b>			
	Unemployed Student	590	87.80%
	Employed Student	82	12.20%

Continued

Choice of Learning Modality		
	Distance Learning (FOAD)	242 36.02%
	Face-to-Face	430 63.98%
Motivation		Intrinsic
Sense of Achievement		Moderate
Self-Efficacy		Moderate

Students reported a good level of ICT usage, and their sense of academic achievement and self-efficacy was rated as “moderate”, indicating a positive perception of ICT use in their learning. The predominant type of motivation observed among the participants is intrinsic motivation. Specifically, 44.4% of students stated: *“I enjoy the content of this program and take pleasure in working and learning within it.”* Furthermore, a substantial majority (63.98%) expressed a clear preference for face-to-face programs over distance learning (FOAD).

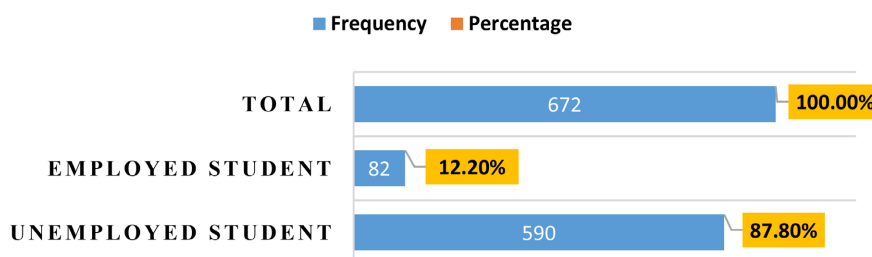
### 3.2. Distribution of the Sample According to Learners’ Socio-Professional Status

To define the profile of the participants in this study, we present (Table 2) their socio-professional status, distinguishing between unemployed students and employed students.

**Table 2.** Distribution according to socio-professional status.

Socio-Professional Status	Frequency	Percentage
Unemployed Student	590	87.80%
Employed Student	82	12.20%
<b>Total</b>	<b>672</b>	<b>100.00%</b>

Table 2 and the corresponding Figure 1 reveal that 87.80% of the learners are non-employed students, representing the most predominant category within our sample.



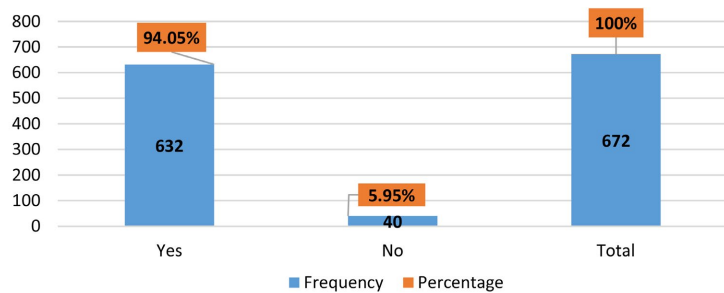
**Figure 1.** Graphical representation of learners’ socio-professional status.

### 3.3. Distribution within the Sample According to the Use of ICT in Teaching

As shown in **Table 3** and the accompanying **Figure 2**, 94.05% of the students express a preference for the integration of ICT in teaching. This therefore represents the most predominant category within our sample.

**Table 3.** Distribution by the use of ICT in teaching.

Response	Frequency	Percentage
Yes	632	94.05%
No	40	5.95%
Total	672	100%



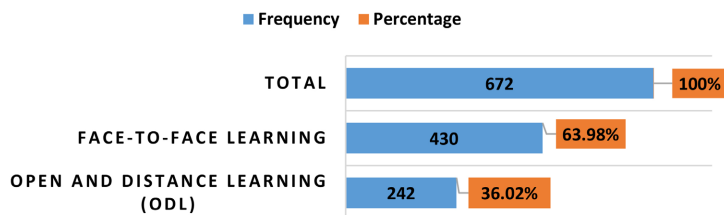
**Figure 2.** Graphical representation of ICT Use in teaching.

### 3.4. Distribution within the Sample According to the Choice of Training Program

**Table 4**, supported by its corresponding **Figure 3**, clearly indicates that 532 students are enrolled in face-to-face programs, while 140 students are registered in distance learning (FOAD). In response to the question, “*If you had the choice, would you opt for distance learning or face-to-face instruction?*” 63.98% of the students expressed a preference for face-to-face education, thereby constituting the most predominant category within our sample.

**Table 4.** Distribution by training program choice.

Training Mode	Frequency	Percentage
Open and Distance Learning (ODL)	242	36.02%
Face-to-Face Learning	430	63.98%
Total	672	100%



**Figure 3.** Graphical representation of training program choice.

### 3.5. Distribution in the Study According to Home Internet Access and Frequency of Use

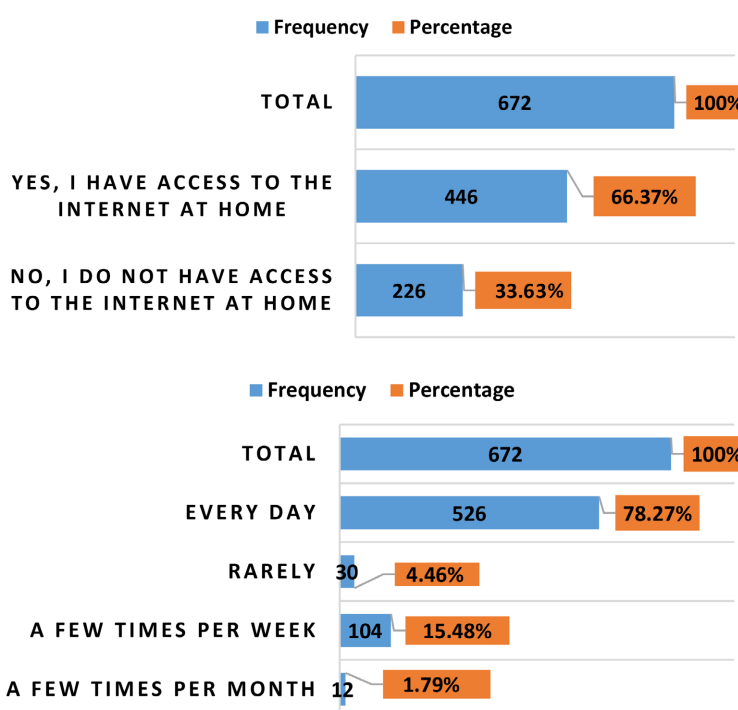
According to the results presented in **Table 5** and illustrated in **Figure 4**, a large majority of students (66.37%) report having access to the Internet at home, while 78.27% state that they use it on a daily basis.

**Table 5.** Questions on home internet access and frequency of use.

Do you have access to the Internet at home?		
Response	Frequency	Percentage
No, I do not have access to the Internet at home	226	33.63%
Yes, I have access to the Internet at home	446	66.37%
<b>Total</b>	<b>672</b>	<b>100.00%</b>

How often do you use the Internet?		
Response	Frequency	Percentage
A few times per month	12	1.79%
A few times per week	104	15.48%
Rarely	30	4.46%
Every day	526	78.27%
<b>Total</b>	<b>672</b>	<b>100.00%</b>



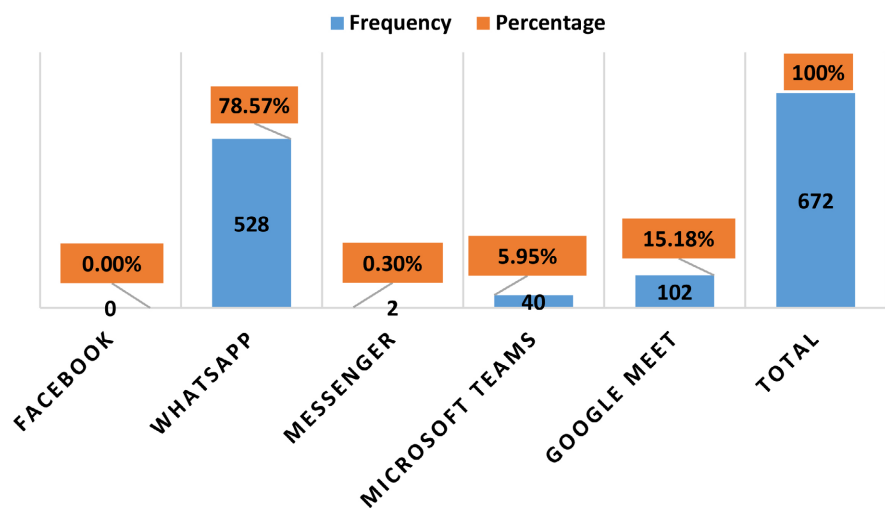
**Figure 4.** Graphical representation of home internet access and frequency of use.

### 3.6. Distribution within the Sample According to Preferred Social Media for Student Interactions in Remote Group Assignments

The data presented in **Table 6**, corroborated by **Figure 5**, show that nearly 78.57% of students identify the social network WhatsApp as the most appropriate tool for their online activities, such as classroom exercises, presentations, and course-related interactions.

**Table 6.** Distribution in the study according to preferred social media for student interactions in remote assignments related to their coursework (Exercises, Presentations, Classes, etc.).

Preferred Social Media for Remote Coursework Interactions	Frequency	Percentage
Facebook	0	0.00%
WhatsApp	528	78.57%
Messenger	2	0.30%
Microsoft Teams	40	5.95%
Google Meet	102	15.18%
<b>Total</b>	<b>672</b>	<b>100.00%</b>



**Figure 5.** Graphical representation of preferred social media for student interactions in remote coursework (Exercises, Presentations, Classes, etc.).

### 3.7. Results from Variable Cross-Analysis

The results of Fisher’s test indicated that the use of ICT and academic achievement are independent ( $T = 0.07$ ; Quantile (0.95) = 224.58;  $\alpha = 0.05$ ). Indeed, since the T-value is below the quantile, the null hypothesis of independence between these two variables cannot be rejected. In contrast, Fisher’s tests revealed a significant relationship between ICT use and student motivation ( $T = 22.47$ ; Quantile (0.95) = 10.13;  $\alpha = 0.05$ ;  $p = 0.023$ ). Similarly, a significant association was observed between motivation and academic achievement ( $T = 11.24$ ; Quantile (0.95) = 9.55;

$\alpha = 0.05$ ;  $p = 0.004$ ).

In summary, these findings suggest that students' age and socio-professional status influence their choice of training program, that ICT use is associated with student motivation, and that motivation, in turn, is linked to academic achievement. However, no significant relationship was identified between ICT use and academic success.

#### 4. Discussion

The results of this research indicate that, while UJLOG students acknowledge the usefulness of ICT in learning, they continue to favor face-to-face instruction. This preference is driven by factors such as social interaction, organizational structure, and pedagogical support, thereby confirming the centrality of human connection in the educational process. These observations align with those of Karsenti, T., Villeneuve, S., Raby, C., Weiss Lambrou, R., & Meunier, H. (2007), who emphasize that the rise of the Internet and multimedia does not imply a full substitution of in-person teaching by distance learning but rather the emergence of new hybrid learning modalities. The originality of our study lies in highlighting how students in an African, specifically Ivorian, context value face-to-face instruction despite their familiarity with digital tools, revealing a tension between technological innovation and traditional pedagogical needs.

Moreover, our survey revealed that, although students are generally well-equipped and have regular access to the Internet, persistent inequalities remain. Approximately 18% of students reported insufficient Internet connectivity, 44.94% did not own a laptop, and 33.63% lacked home Internet access. These disparities, strongly correlated with family socio-economic and occupational status, echo the findings of Mercklé and Octobre (2012), who argue that widespread ICT use does not necessarily equate to democratization. Similar to their observations, we note that the so-called *digital natives* remain segmented: a minority from affluent backgrounds demonstrates diverse and frequent ICT usage, whereas the majority exhibits more limited engagement, reflecting later familiarization with digital technologies. The contribution of our study lies in confirming this phenomenon within a context that remains underexplored, namely higher education in Côte d'Ivoire.

Furthermore, the analysis of student motivation reveals a high level of intrinsic motivation, a phenomenon previously documented by Deci and Ryan (1985) in their self-determination theory. Our findings show that this internal motivation translates into greater engagement, higher satisfaction, and stronger retention of learning. This observation confirms the relevance of psychological models of motivation applied to ICT use while introducing an important nuance: in our context, ICT does not replace motivation; rather, it acts as a catalyst for engagement and academic success.

The use of WhatsApp as the primary academic communication tool exemplifies this dynamic. Our results indicate that students perceive this application as prac-

tical and efficient for sharing resources and collaborating on projects. These findings corroborate the work of Rambe, P., & Bere, A. (2013) and So, S. (2016), who highlighted the growing importance of mobile applications in informal and collaborative learning environments. However, the originality of our study lies in demonstrating that WhatsApp functions not only as a communication tool but also as a genuine learning support within an African university, highlighting students' adaptive use of available tools within their socio-economic environment.

Regarding perceptions of ICT, our results show that students believe these tools can substantially enhance their preparation and academic success (mean score: 3.2). This conclusion is consistent with previous studies by Kearsley, G., & Shneiderman, B. (1998) and Kulik, J. A. (1994), which demonstrated the potential of ICT to improve academic outcomes. Additionally, our results support the observations of Prensky, M. (2001) and Tapscott, D. (1998) regarding students' increasing digital literacy, as well as those of Bandura, A. (1997) and Zimmerman, B. J. (2000) concerning the importance of self-efficacy. The innovative aspect of our study lies in the positive correlation observed between self-efficacy and intrinsic motivation, indicating that ICT use extends beyond technical support to also enhance students' confidence in their abilities.

Finally, cross-variable analyses highlighted relationships between several variables: age and choice of study mode, as well as socio-professional status and type of training. These findings are consistent with the sociological analyses of Bourdieu, P. (1986), Dubar, C. (2002), and Boudon, R. (1973), which emphasize the role of social capital and social trajectories in educational choices. Similarly, we observed that ICT use is linked to motivation, and that motivation, in turn, influences academic achievement, supporting the conclusions of Bandura, A. (1997) and Zimmerman, B. J. (2000). However, our study diverges from certain previous research (Kulik, 1994; Wenglinsky, 1998), as no direct relationship between ICT use and academic success was identified. This unexpected result may be explained by local specificities, such as access disparities, variable Internet quality, or increased reliance on informal communication tools like WhatsApp.

In conclusion, this study contributes to the existing literature by confirming findings established in Western contexts while emphasizing the specificities of an African context characterized by persistent socio-economic inequalities and distinctive appropriation of digital tools. It thus highlights the need for educational policies that simultaneously leverage the potential of ICT and address local realities to promote more inclusive academic success.

## 5. Limitations, Future Directions, and Contributions

Our study highlighted several key findings regarding ICT usage and student motivation at UJLOG. The results indicate that, although students recognize the importance of ICT in their learning, they still favor face-to-face instruction due to factors related to social interaction and pedagogical support. However, it is important to acknowledge certain methodological limitations: the sample is small

and specific to UJLOG, which restricts the generalizability of the results to other university contexts; additionally, the exclusive use of questionnaires may introduce measurement bias, while the focus on specific variables (ICT usage, motivation, and academic achievement) excludes other potentially influential factors. These limitations suggest caution when generalizing the findings.

Nevertheless, the study opens up promising avenues for future research. Longitudinal surveys could be conducted to analyze the evolution of digital practices and motivation over time, while larger and more diverse samples would allow comparisons across different academic contexts. Furthermore, integrating qualitative approaches would provide a deeper understanding of the underlying mechanisms, and pedagogical experiments could assess the impact of specific interventions on ICT usage and student motivation.

Finally, this research offers several original contributions. Unlike some previous studies, our findings indicate that ICT usage and academic achievement appear as independent variables, suggesting that technological access alone does not guarantee academic performance. In contrast, intrinsic motivation emerges as a central factor for success, confirming its pivotal role in student engagement. Moreover, the study highlights socio-economic inequalities in access to digital resources, emphasizing a major challenge in democratizing education. Additionally, the identification of WhatsApp as a preferred tool for communication and collaboration illustrates the emergence of informal pedagogical practices, which have been relatively underexplored in prior research. Overall, our work contributes to the understanding of the relationship between ICT, motivation, and academic achievement, while offering concrete directions for future research and educational practice.

## 6. Conclusion

In conclusion, our study demonstrated that Information and Communication Technologies (ICT) can enhance student motivation and academic achievement, although their impact depends on various socio-economic factors. The aim of this research is to foster an inclusive and equitable learning environment that promotes the success of all students. The study revealed that students at Jean Lorougnon Guédé University (UJLOG) are supportive of ICT in education and actively use these technologies for learning and completing assignments. Students are generally well-equipped with technology and routinely use the Internet as a regular source of information. Intrinsic motivation emerges as a key factor driving their engagement and success in learning activities. However, the findings also indicate that digital inequalities persist, despite the increasing adoption of ICT in teaching and learning. Students with limited access to digital resources may be disadvantaged compared to those with broader access. Moreover, the study revealed significant relationships among the variables examined, particularly between age and choice of training program, as well as between ICT usage and student motivation. Nonetheless, ICT use and academic achievement were found to

be independent. Overall, our study supports hypothesis H2, which posits that “students with better access to ICT exhibit higher levels of motivation and academic achievement than those without such access.”

The results also indicate that instructors should incorporate Information and Communication Technologies (ICT) into their teaching to enhance interaction and collaboration with students. The findings of this research should be considered by educational institutions to optimize the learning experience for both distance and face-to-face students. Moreover, the data highlight the importance of raising awareness about the usefulness of digital technologies and fostering a better understanding of the value of digital skills for students. Overall, this study enriches our understanding of ICT use in educational contexts and provides guidance for optimizing teaching methods and supporting students in their learning processes. The findings can serve as a reference for policymakers and educators to enhance the integration of ICT in teaching and learning. To maximize the benefits of ICT in education, it is essential to consider students’ needs and abilities, as well as the existing resources and opportunities.

Accordingly, we recommend that educators and institutions:

- 1) Take into account disparities in access to digital resources and home internet to improve accessibility and reduce inequalities among students.
- 2) Design learning activities that accommodate the needs and capacities of students with limited access to digital resources.
- 3) Implement institutional strategies to enhance access to digital resources and reduce inequities between students.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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