



American Journal of Education and Technology (AJET)

ISSN: 2832-9481 (ONLINE)

VOLUME 5 ISSUE 2 (2026)



PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Investigating Perspectives of Students on Barriers to ICT Integration in Higher Education: A Case Study of the English Department at the School of Arts and Humanities of Sidi Mohamed Ben Abdellah University

Merouane El Hatimy^{*}, Khalid Houssaini¹

Article Information

Received: February 13, 2026

Accepted: April 23, 2026

Published: June 16, 2026

Keywords

*Higher Education, ICT,
Language Learning, Language
Teaching, Morocco*

ABSTRACT

Ever since the emergence of Information and Communication Technology (ICT), there have been growing demands for its integration in higher education (HE). In response to these demands, Moroccan higher education institutions have implemented several national strategies and digital initiatives that aim to modernize universities and enhance teaching and learning processes. Despite these efforts, effective ICT integration within Moroccan universities remains limited, especially within public institutions. Therefore, the present study aims to explore and understand the barriers to ICT integration in Moroccan higher education from the perspectives of students. It adopts a mixed-methods approach that combines quantitative and qualitative data collected through a questionnaire administered to students of the English Department at the School of Arts and Humanities of Sidi Mohamed Ben Abdellah University. The study examines both internal and external barriers influencing ICT integration among students and their professors, as perceived by students. The findings reveal that ICT integration remains limited due to a wide range of internal and external barriers. External barriers are mainly related to infrastructural and institutional factors such as limited access to ICT resources, technical problems, and lack of support, while internal barriers are linked to attitudes, skills, resistance to change, and classroom practices. The study also shows that although ICT is widely recognized as important and is frequently used by students, its integration in teaching practices remains very basic rather than transformative. These findings highlight the gap between the presence of ICT and its effective pedagogical integration in Moroccan higher education.

INTRODUCTION

Morocco has launched several national digital strategies, including Maroc Numeric 2013 and Maroc Digital 2020, to promote the modernization of higher education and the integration of information and communication technologies (ICT). In collaboration with international organizations such as the Islamic World Educational, Scientific and Cultural Organization (ICESCO), Morocco has also undertaken initiatives to support the digital transformation of higher education, including the development of the Maroc Université Numérique (MUN) platform. This platform provides online courses, digital resources, and virtual learning environments that support the adoption of distance and blended learning practices. In parallel, partnerships with technology companies have contributed to enhancing digital skills through training programs, while administrative systems such as Apogée have been implemented to manage student and academic data. Despite these efforts, ICT integration remains limited, reflecting an ongoing process of digital transformation within Moroccan higher education. However, ICT integration remains limited in Moroccan higher education due to several interconnected challenges. There is a lack of adequate ICT equipment and reliable internet access in many universities. In addition, some

professors and students often lack the necessary ICT skills due to insufficient training. The issue is further complicated by the absence of clear institutional policies and consistent support systems, which makes ICT integration dependent on individual efforts rather than structured strategies. Moreover, a digital divide persists among students, as not all of them have equal access to devices or stable internet connections. At the same time, users' attitudes play an important role, as some professors and students show low motivation or resistance toward adopting new technologies. Pedagogical and time constraints also limit integration, as professors face heavy workloads and lack the time to redesign their courses using ICT. Even when they attempt to do so, technical problems and lack of immediate support often discourage effective integration, leading many to rely on traditional teaching methods. These challenges highlight a gap between national digital policies and their actual implementation, where ICT remains present in theory but only partially integrated in practice.

Based on Ertmer's (1999) categorization of barriers to ICT integration in education, this study aims to explore how both internal and external barriers influence ICT integration in Moroccan higher education from the perspectives of students, including their perceptions of

¹ Sidi Mohamed Ben Abdellah University, Morocco

^{*} Corresponding author's e-mail: merouane.elhatimy@gmail.com

their professors' practices.

While ICT integration barriers in higher education have been studied in the Moroccan context, most research has focused primarily on the perspectives of professors. There is limited research that addresses how students perceive these barriers, particularly in relation to both their own use of ICT and that of their professors. This gap highlights the need for a more comprehensive investigation that incorporates students' perspectives, given that they are the primary beneficiaries in the process. This study is significant because it adopts both quantitative and qualitative procedures to examine how students perceive ICT integration barriers in Moroccan higher education. Understanding these barriers from students' perspectives can contribute to a deeper understanding of the issue and support more informed decision-making. The study attempts to answer the following questions:

A. How do students perceive internal and external barriers and their influence on ICT integration in higher education?

B. What ICT tools do students integrate in their learning, and what ICT tools do they perceive their professors integrate in teaching?

C. How do students experience ICT integration in their learning, and how do they perceive its implementation in teaching practices?

D. What are students' perceptions of the advantages and disadvantages of ICT in higher education?

LITERATURE REVIEW

Defining ICT in Education

People often believe that ICT refers only to computers and their use. However, although computers are part and parcel of ICT, the concept actually includes a wide range of hardware devices and software applications (Srivastava, 2016).

Tinio (2003) describes ICT as a broad set of technological tools and resources used for communication, as well as for creating, storing, disseminating, and managing information. These technologies include computers, the internet, broadcasting technologies (radio and television), and telephony. The researcher further adds that older communication tools such as the telephone, radio, and television are also considered part of ICT.

Similarly, a United Nations report (1999, as cited in Srivastava, 2016) explains that ICT includes internet services, telecommunications equipment and services, information technology equipment and services, media and broadcasting, libraries and documentation centers, commercial information providers, network-based information services, and other related information and communication activities.

External Barriers to ICT Integration

Lack of ICT Equipment

Lack of ICT equipment is considered a major barrier to ICT integration in education, while institutions that are well equipped with ICT tend to encourage teachers

to incorporate technology into classroom practices (Balanskat *et al.*, 2006). For instance, many teachers in an Australian school integrated ICT into their teaching due to the availability of adequate ICT infrastructure (Afshari *et al.*, 2009). Similarly, Al-Alwani (2005) argues that insufficient ICT hardware represents an obstacle to ICT integration in schools in Saudi Arabia, which aligns with Albirini's (2006) view that limited availability of ICT tools and resources hinders effective classroom integration. Similarly, Becta (2004) emphasizes that limited access to ICT resources can negatively affect the use of technology in education. However, in the Moroccan context, Fatmi (2012) suggests that access to ICT equipment is not necessarily a determinant of the level of ICT integration.

Lack of ICT Resources

Al-Alwani (2005) points out that limited access to the internet is one of the barriers to ICT integration. In addition, teachers often face a shortage of ICT resources that are specifically designed for teaching purposes (Unal and Ozturk, 2012). In this regard, Becta (2004) argues that schools equipped with adequate ICT resources tend to perform better than those that lack them. However, Balanskat *et al.* (2006) explain that even when schools have high-quality ICT resources, their effectiveness may be reduced if they are not properly organized or optimally used. For example, some schools require prior booking of ICT classrooms, while in other cases the internal school network cannot be accessed from outside. As a result, teachers and students may not have the flexibility to use ICT whenever it is needed.

Technical Issues

Becta (2004) highlights that the quality of available hardware represents a clear barrier to ICT integration. Beyond mere availability, the condition and quality of hardware can also reduce teachers' willingness to use ICT in their teaching practices, particularly when students are working with more up-to-date technologies (Preston *et al.*, 2000). Similarly, Balanskat *et al.* (2006) argue that poor-quality hardware and inappropriate software may discourage teachers from integrating ICT. Sicilia's study (2005) similarly shows that technical problems hinder effective ICT use in education. Likewise, Bosley and Moon (2003, as cited in Afshari, 2009) explain that software that is not specifically designed for educational purposes cannot be effectively integrated into classroom practices. In addition, Madronio (2023) emphasizes the problem of insufficient and ineffective ICT maintenance, noting that it negatively affects teachers, administrators, and ICT coordinators, which in turn reduces the effectiveness of ICT integration.

Lack of Technical Support and ICT Training

Tong and Trinidad (2005) emphasize that technical support plays a crucial role in ICT integration, as its absence can negatively influence teachers' readiness to adopt ICT in their teaching practices. Similarly, participants in Becta's

(2004) survey reported challenges related to insufficient technical support, including “lack of technical back-up or expertise when things go wrong” and the absence of an “on-site ICT manager to support teachers in lessons” (p. 16).

In addition to technical support issues, Unal and Ozturk (2012) explain that teachers’ lack of ICT skills is closely linked to insufficient ICT training. Similarly, Abedi and Ackah-Jnr (2023) report that lack of ICT training is one of the main barriers to effective ICT integration, as highlighted by participants in the study.

Time Constraints

Time constraints are considered a major barrier to ICT integration in education (Mumtaz, 2000). Fabry and Higgs (1997, as cited in Becta, 2004) explain that teachers often have limited time available after spending most of their day teaching and fulfilling other responsibilities such as communicating with parents and attending staff meetings, noting that teachers need time to experiment with technology, share experiences with colleagues, and participate in in-service training related to ICT.

In addition, Preston *et al.* (2000) note that teachers need sufficient time to explore and prepare appropriate ICT resources. Similarly, Unal and Ozturk (2012) found that half of the participants in the study identified lack of time as a significant barrier to ICT integration.

Contextual Factors

Afshari *et al.* (2009) emphasize the important role of contextual factors in ICT integration. The researchers explain that it is essential to involve all stakeholders, including teachers, parents, students, and the wider community, and to enable them to contribute to shaping the guiding vision through their knowledge, skills, and positive attitudes.

Balanskat *et al.* (2006) explain that educational systems can sometimes resist ICT integration, noting that even when educators are not resistant to ICT, the system in which they work may be.

Internal Barriers to ICT Integration

Lack of Motivation and Incentives

Al Shboul *et al.* (2017) point out that “low motivation for using new technologies” (p. 67) is one of the most common barriers to ICT integration. In this regard, Granger *et al.* (2002) stress the importance of encouraging teachers in order to help them overcome misconceptions about the use of ICT in education. Similarly, a participant in Du Plessis and Webb’s (2012) study stated that teachers “need to be encouraged” (p. 319). These researchers further argue that rewards and incentives are important factors in promoting ICT integration. In addition, Osman (2014) identifies the lack of incentives as a significant barrier to ICT integration in higher education.

Teachers’ Beliefs, Attitudes, and Interests

The level of ICT integration is strongly influenced by

teachers’ perceptions of ICT (Abedi and Ackah-Jnr, 2023; Drent and Meelissen, 2007). Christensen and Knezek (2016) further note that teachers’ beliefs about ICT significantly shape their willingness to adopt and use it in educational settings. In line with this, Lawton and Gerschner (1982, as cited in Afshari, 2009) explain that the effective use of technology in the classroom largely depends on teachers’ attitudes toward these tools.

Ertmer (1999) distinguishes between internal and external barriers to ICT integration, arguing that internal barriers are deeply personal and therefore more difficult to identify, understand, and overcome. Similarly, Asare *et al.* (2023) emphasize that successful ICT integration depends greatly on teachers’ perceptions of ICT, noting that teachers with positive attitudes are more likely to integrate it into their classroom practices.

Lack of ICT Skills

Abedi and Ackah-Jnr (2023) state that lack of ICT knowledge among teachers is one of the barriers to ICT integration, a finding that was also confirmed by participants in the study. The researchers further explain that this problem results from insufficient technology-related professional development and training. In the same vein, Becta (2004) emphasizes that possessing ICT knowledge is a fundamental prerequisite for effective ICT integration.

Similarly, Mijares (2022) argues that although teachers demonstrated a high level of ICT competency based on the National ICT Competency Standards for Teachers (NICS), particularly in technology operations and concepts, they still lack the necessary skills to use ICT for meaningful learning.

The Effect of Gender

The European Commission (2002, as cited in Becta, 2004) reports that ICT use is higher among male teachers, with 77% of males using ICT compared to 66% of females. Bradley and Russell (1997) further explain that feelings of anxiety and frustration toward ICT tend to be more common among female teachers. Similarly, Jamieson-Proctor *et al.* (2006) note significant differences in ICT integration levels between male and female teachers, with males showing higher levels of use. However, Fatmi (2012) presents a different finding in the Moroccan context, concluding that female teachers demonstrate more positive attitudes toward ICT than male teachers.

The Effect of Age

Abedi and Ackah-Jnr (2023) explain that senior teachers often perceive ICT as something mainly used by new teachers or by those who specialize in ICT-related subjects. Similarly, the National Centre for Education Statistics (2000, as cited in Afshari *et al.*, 2009) reports that higher levels of ICT integration are more commonly found among newer teachers. Similarly, Hsu *et al.* (2007) argue that teachers with less than ten years of experience tend to have stronger computer skills, as they are more

likely to have taken computer-based instruction courses during their teacher training. In the Moroccan context, Fatmi (2012) also finds that younger teachers use ICT more frequently. However, Ertmer *et al.* (2007) present a contrasting view, stating that there is little difference in ICT integration levels between novice and experienced teachers.

MATERIALS AND METHODS

Research Hypothesis and Objective

The study hypothesizes that ICT integration among students of the English Department at USMBA and their professors is influenced by both internal and external barriers. Therefore, the study aims to explore and understand how these barriers influence ICT integration in the target department from students’ perspectives.

Population and Sampling

The study population consists of students in the English Department at the School of Arts and Humanities of Sidi Mohamed Ben Abdellah University. The study employed a non-probability sampling technique, specifically convenience sampling, as participants were selected based on their accessibility and willingness to participate. The questionnaire was digitally administered to students via the department’s Facebook and WhatsApp groups. Several variables were taken into consideration, including level of education, gender, and age. In total, 125 students participated in the study, including BA, MA, and PhD students.

Table 1 shows that participants are divided into three categories. The majority of participants (56.0%) are BA

Table 1: Participants’ Level of Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BA student	70	56.0	56.0	56.0
	MA student	21	16.8	16.8	72.8
	PhD student	34	27.2	27.2	100.0
	Total	125	100.0	100.0	

Table 2: Gender of Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	75	60.0	60.0	60.0
	Male	50	40.0	40.0	100.0
	Total	125	100.0	100.0	

Table 3: Age Categories of Participants

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 – 25	77	61.6	61.6	61.6
	26 – 30	26	20.8	20.8	82.4
	31 – 35	8	6.4	6.4	88.8
	36 – over 40	14	11.2	11.2	100.0
	Total	125	100.0	100.0	

students (N = 70, where N is the number of participants), followed by 27.2% of PhD students (N = 34), and 16.8% of MA students (N = 21).

Table 2 demonstrates that the majority of participants (60.0%) are females (N = 75), while 40% are males (N = 50). As shown in Table 3 above, the ages of participants range from 20 to over 40 years. The majority of participants, 77 (61.6%), are aged between 20 and 25 years. Twenty-six participants (20.8%) are aged between 26 and 30 years, while 8 participants (6.4%) are aged between 31 and 35 years. Finally, 14 participants (11.2%) are aged over 36 years.

Research Instruments

The main data collection instrument used in this study was a questionnaire developed on Google Forms. It included both quantitative and qualitative question items

and was administered digitally through student groups. The questionnaire consisted of 14 questions, in addition to a section for participants’ additional insights.

Specifically, it included 10 quantitative, closed-ended items addressing demographic variables, familiarity with ICT, frequency of ICT use, ICT tools used by students and their professors, perceived barriers, and the advantages and disadvantages of ICT integration. It also included 4 qualitative, open-ended items exploring participants’ understanding of ICT, its importance in education, barriers to ICT integration, and students’ perceptions of both their own role and that of their professors in ICT integration.

Validity and Reliability

To ensure validity, the questionnaire items were developed based on a review of the literature on ICT integration

barriers and were examined for content relevance. The questionnaire was also piloted with a small group of 10 students from the sample to assess clarity and appropriateness.

Regarding reliability, it was considered through the internal consistency of the questionnaire items, while the coherence between quantitative and qualitative findings further strengthened the overall credibility of the results.

Ethical Considerations

Participants were informed about the purpose of the study and assured that their participation was voluntary. The questionnaire included a consent statement clarifying that responses would remain anonymous and confidential. No personal information was collected, and participants had the right to withdraw at any time. These measures ensured that the study adhered to established ethical

standards in academic research.

Data Analysis

The quantitative data collected through the questionnaire were downloaded in Excel format and then imported into SPSS for statistical analysis. The qualitative data were also downloaded in Excel format and analyzed thematically.

The analysis focused on identifying recurring themes related to internal and external barriers to ICT integration. Initial codes were assigned to qualitative responses and then grouped into broader categories. Quantitative and qualitative data were analyzed concurrently, as each method provided complementary insights that supported and enriched the overall findings.

RESULTS AND DISCUSSION

Analysis of Quantitative Data

Table 4: Familiarity with the Concept of ICT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I am an expert in ICT	10	8.0	8.0	8.0
	Not familiar at all	8	6.4	6.4	14.4
	Somewhat familiar	39	31.2	31.2	45.6
	Very familiar	68	54.4	54.4	100.0
	Total	125	100.0	100.0	

Table 5: Frequency of Participants' ICT Integration in Learning Processes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	All the time	58	46.4	46.4	46.4
	Occasionally	15	12.0	12.0	58.4
	Rarely	6	4.8	4.8	63.2
	Very often	46	36.8	36.8	100.0
	Total	125	100.0	100.0	

Table 6: Students' Perceptions of Professors' ICT Integration in Teaching

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	7	5.6	5.6	5.6
	Yes	118	94.4	94.4	100.0
	Total	125	100.0	100.0	

Table 4 shows that the overwhelming majority of participants (54.4%) (N = 68) were very familiar with the concept of ICT in education. About 31% (N = 39) were somewhat familiar, while only 6.4% (N = 8) were not familiar at all. Ten participants (8.0%) identified themselves as experts in the field of ICT.

Table 5 demonstrates that 46.4% of participants (N = 58) used ICT in their learning all the time. ICT was used very often by 36.8% of participants (N = 46), occasionally by 12.0% (N = 15), and rarely only by 4.8% (N = 6).

As shown in Table 6, 94.4% of participants (N = 118) reported that their professors integrated ICT tools in teaching practices, while only 5.6% (N = 7) reported otherwise.

Table 7 indicates that professors most commonly used desktops or laptops, as reported by 90.3% of participants (N = 112). Data show was used by 75.8% (N = 94), online platforms by 46.8% (N = 58), and speakers by 41.9% (N = 52). Mobile phones were integrated by 41.1% (N = 51) of professors, mobile applications by 21.8% (N = 27), and interactive whiteboards by 12.1% (N = 15). Last but not least, the use of televisions in the classroom was reported only by 5.6% of participants (N = 7).

Table 8 shows that 87.2% of participants (N = 109) believed that ICT provides easier access to information. Enhanced learning experiences were reported by 72.0% of participants (N = 90), while flexibility in learning and teaching was highlighted by 68.0% (N = 85). Additionally,

Table 7: Familiarity with the Concept of ICT

		Responses		Percent of Cases
		N	Percent	
Integrated ICT Tools ^a	Desktop or laptop	112	26.9%	90.3%
	Data show	94	22.6%	75.8%
	Interactive whiteboard	15	3.6%	12.1%
	Mobile phones	51	12.3%	41.1%
	Television	7	1.7%	5.6%
	Speakers	52	12.5%	41.9%
	Online platforms	58	13.9%	46.8%
	Mobile applications	27	6.5%	21.8%
Total		416	100.0%	335.5%

a. Dichotomy group tabulated at value 1.

Table 8: Advantages of ICT in Higher Education

		Responses		Percent of Cases
		N	Percent	
Advantages of ICT Integration ^a	Enhanced learning experiences	90	19.3%	72.0%
	Easier access to information	109	23.3%	87.2%
	Flexibility in learning and teaching	85	18.2%	68.0%
	Facilitation of communication and collaboration	71	15.2%	56.8%
	Global learning opportunities	56	12.0%	44.8%
	Personalized learning experiences	56	12.0%	44.8%
Total		467	100.0%	373.6%

a. Dichotomy group tabulated at value 1.

Table 9: Disadvantages of ICT in Higher Education

		Responses		Percent of Cases
		N	Percent	
Disadvantages of ICT ^a	Digital divide	60	17.8%	48.4%
	Technical issues	79	23.4%	63.7%
	Overreliance on technology	53	15.7%	42.7%
	Security and privacy issues	35	10.4%	28.2%
	Lack of social interaction	42	12.4%	33.9%
	Digital distractions	69	20.4%	55.6%
Total		338	100.0%	272.6%

a. Dichotomy group tabulated at value 1.

56.8% of participants (N = 71) noted that ICT facilitates communication and collaboration. Global learning opportunities and personalized learning experiences were each reported by 44.8% of participants (N = 56).

Table 9 illustrates that technical issues were the most commonly reported disadvantage of ICT, mentioned by 63.7% of participants (N = 79). Digital distractions were selected by 55.6% (N = 69), while the digital divide was reported by 48.4% (N = 60). Overreliance on technology was highlighted by 42.7% (N = 53), lack of social interaction by 33.9% (N = 42), and security and privacy concerns by 28.2% (N = 35).

Table 10 shows that technical problems and lack of

support were the most frequently cited barriers, selected by 67.7% of participants (N = 84). Lack of access to ICT materials was reported by 63.7% (N = 79), while 47.6% (N = 59) noted insufficient ICT equipment. Lack of or inappropriate ICT training was highlighted by 45.2% of participants (N = 56), and 29.0% (N = 36) mentioned lack of competence. Time constraints were cited by 25.8% (N = 32), and the school environment by 25.0% (N = 31). The effect of age was reported by 24.2% (N = 30), professor resistance to change by 16.9% (N = 21), lack of incentives by 11.3% (N = 14), and only 5.6% (N = 7) believed gender affected ICT integration.

Table 10: Frequently Encountered Internal and External Barriers to ICT Integration in Higher Education

		Responses		Percent of Cases
		N	Percent	
Barriers to ICT Integration ^a	Lack of access to materials	79	17.6%	63.7%
	Technical problems and lack of support	84	18.7%	67.7%
	Lack of or inappropriate ICT training	56	12.5%	45.2%
	Lack of adequate equipment	59	13.1%	47.6%
	Time constraints	32	7.1%	25.8%
	School environment	31	6.9%	25.0%
	Lack of incentives	14	3.1%	11.3%
	Lack of competence	36	8.0%	29.0%
	The effect of age	30	6.7%	24.2%
	The effect of gender	7	1.6%	5.6%
	Resistance to change	21	4.7%	16.9%
Total	449	100.0%	362.1%	

a. Dichotomy group tabulated at value 1.

Analysis of Qualitative Data

Participants' Definitions of ICT

Participants provided related definitions of ICT with slight variations in focus and wording. Participant 1 defined ICT as “an extensional term for information technology (IT) that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals) and computers.” Participant 2 explained ICT as something that “stands for Information and Communication Technology. It encompasses technologies used to manage and communicate information, including computers, telecommunications equipment, and software applications.” Participant 3 stated that ICT refers to the use of “information and communications technology to support, enhance, and optimize the delivery of information.” In addition, Participant 4 said that “ICT is used by students and teachers to collect information,” while Participant 5 referred to ICT as “the use of technology in the teaching and learning process.”

Importance of ICT in Education

Participants highlighted the importance of ICT in education with varying perspectives. Participant 6 explained that ICT “is important because we are living in the age of technology in addition to the fact that technology facilitates the process of learning and access to information.” Participant 7 indicated that “ICT is important in teaching and learning as it enhances access to information, promotes interactive learning experiences, facilitates collaboration, enables personalized instruction, and prepares students for the digital age.” Participant 8 stated that ICT is important “since modern life requires the use of the technology and also because learners have different learning styles and ICT can meet these needs.” Participant 9 mentioned that ICT “makes learning more interactive and fun.” However, Participant 10 expressed a different view, stating: “I wouldn't say it's important

since many generations managed to learn without incorporating its use in learning and teaching practices. However, it has lately become a trend and, apparently, it's not going anywhere anytime soon.”

Barriers that Participants and their Professors Encounter in ICT Integration

Participants identified several barriers to ICT integration in higher education. Participant 11 said: “sometimes lack of equipment remains the direct challenge that our teachers face.” Participant 12 explained that “when it comes to teachers, the most recurrent challenge that I can mention is the lack of adequate equipment in the workplace.” Participant 13 stated that “teachers often struggle with the data show because it doesn't work properly all the time.” Participant 14 noted that “dealing with technical glitches, software compatibility issues, and unreliable internet connectivity can disrupt the flow of lessons and impede the effective use of ICT tools in the classroom.” Participant 15 said: “I see that some teachers are not competent enough to use ICT for educational purposes.”

Participant 16 indicated that among the barriers to ICT integration is “personal reluctance of some teachers.” Participant 17 explained that “we can't say the worst, but due to the age gap between teachers and the invention of ICT, teachers are less inclined in dealing with these technologies.” Participant 18 mentioned that “the effect of age and seniority was probably the main challenge as most teachers prefer traditional methods of teaching over modern ones.” Participant 19 stated that some students “may resist or lack the necessary skills to effectively utilize technology for learning purposes.” Participant 20 indicated that “students themselves could pose a significant barrier to ICT use in higher education due to varying levels of technological proficiency, resistance to change, or distractions.” Participant 21 explained that teachers “may be resistant to change or lack the

training needed to effectively incorporate technology into their teaching practices.” Participant 22 suggested that “the overreliance on handouts by some teachers turns the session to be inefficient and inactive, so teachers’ reluctance could also be a barrier.”

Other ICT Integration Barriers Mentioned by Participants

Participants mentioned additional barriers to ICT integration in education. Participant 23 identified “electricity cut” as a significant barrier to ICT integration. Participant 24 suggested that ICT integration becomes challenging when there is “a sudden blackout.” Participant 25 explained that “integrating ICT effectively into the curriculum while maintaining pedagogical goals and ensuring meaningful learning experiences for students requires careful planning, training, and ongoing support, which can be challenging for teachers.” Participant 26 stated that “one significant challenge faced by teachers when using ICT for learning or teaching is the digital divide among students. Not all students have equal access to technology or the internet, creating disparities in participation and engagement.” Participant 27 said: “I have faced some issues like bad advertisement, which makes me more nervous sometimes,” while Participant 28 also highlighted “the emergence of bad ads.”

Participants’ Additional Insights into ICT Integration Barriers

Participants provided additional insights related to ICT integration barriers. Participant 29 said: “the Moroccan system of education should reconsider the importance of ICT and students must learn how to use ICT tools. That is to say, it should be a subject from the secondary school on so that students will be able to use it throughout their life.” Participant 30 said: “I think that ICT has become one of the most important things that we cannot live without. Frankly speaking, we are no more humans,” adding that we are moving “toward a posthuman era.” Participant 31 explained that “successful ICT integration requires both teachers and students to be digitally literate and open to change. Support from the institution, such as training, reliable infrastructure, and access to resources, is also crucial. Without these, even the best technology may not improve learning outcomes.” Participant 32 noted that “the government and ministry should put measures to encourage teachers and universities to implement ICT and keep up with the exponential growth in technology with an aim to enhance teaching and learning.” Participant 33 said that “we should think about students who live in places where the network is weak, who cannot afford the equipment, and who are disadvantaged compared to those who have access to technology.”

Discussion of Findings

Internal and External Barriers to ICT Integration in Higher Education (RQ A)

The findings indicate that ICT integration in Moroccan

higher education is constrained by a wide range of internal and external barriers. External barriers are primarily related to infrastructural and institutional limitations, including lack of ICT equipment, limited access to resources, unreliable internet connectivity, technical problems, and insufficient technical support. These challenges were consistently reported across both quantitative and qualitative data, highlighting the role of institutional conditions in shaping ICT implementation. In addition to these structural challenges, internal barriers also play a significant role. These include lack of ICT competence, resistance to change, low motivation, and negative attitudes toward technology use. Participants further emphasized the influence of age and experience, suggesting that some professors are less inclined to adopt ICT due to generational differences and insufficient training.

These findings confirm Ertmer’s (1999) distinction between first-order and second-order barriers, demonstrating that ICT integration is not influenced only by technical and institutional factors but also by individual characteristics.

ICT Tools Used by Students and Perceived ICT Integration in Teaching (RQ B)

The results show that students frequently use ICT in their learning, reflecting a high level of digital engagement. Similarly, they report that their professors integrate ICT into teaching practices, although this integration is mainly limited to basic tools such as laptops, data projectors, online platforms, and speakers.

More advanced technologies, such as interactive whiteboards and mobile applications, are used less frequently, suggesting that ICT integration remains largely at a functional level rather than an innovative or transformative one. This indicates that ICT is primarily used for content delivery rather than interactive or student-centered pedagogical practices.

Students’ Experiences of ICT Integration in Learning and Teaching Practices (RQ C)

The findings suggest that students generally perceive ICT integration positively, recognizing its role in improving access to information, supporting flexible learning, and enhancing engagement. ICT is also viewed as a tool that can meet different learning needs and styles and promote interaction in the learning process.

However, despite these positive perceptions, students’ actual learning experiences indicate that ICT integration remains limited. ICT is often used in a basic and supplementary manner rather than as a tool for innovation or transformation in teaching and learning. This reflects a gap between the potential of ICT and its actual implementation.

Students also perceive that ICT integration in classroom practices is affected by several constraints, including technical problems, lack of training, and infrastructural limitations. As a result, ICT use in teaching remains

limited and largely dependent on individual effort and investment.

Students' Perceptions of Advantages and Disadvantages of ICT in Higher Education (RQ D)

The findings reveal that students perceive ICT as a valuable tool in higher education. The main advantages identified include easier access to information, enhanced learning experiences, increased flexibility, improved communication, and opportunities for personalized and global learning. These perceptions highlight ICT's potential to support more dynamic, accessible, and inclusive learning environments.

However, participants also identified several disadvantages. These include technical issues, digital distractions, overreliance on technology, lack of social interaction, security and privacy concerns, and the digital divide among students. These challenges indicate that while ICT offers significant benefits, its impact is not entirely positive and depends on access, infrastructure, and user practices.

Synthesis of Findings Across Research Questions

Overall, the findings across all research questions reveal consistent patterns in relation to ICT integration. Students demonstrate a high level of familiarity with ICT and use it frequently in their academic activities. ICT is also present in teaching practices, although its use remains mostly basic and instrumental.

Despite the recognized benefits of ICT, its effective integration is constrained by both external factors, such as infrastructure and technical support, and internal factors, such as attitudes, skills, and resistance to change. This results in a persistent gap between the availability of ICT tools and their effective pedagogical integration, as stated at the very beginning in this paper.

These findings suggest that ICT in Moroccan higher education remains more present at the level of access and use than at the level of meaningful pedagogical transformation.

CONCLUSIONS

The findings indicate that students in Moroccan higher education are generally familiar with ICT and use it frequently for learning purposes. They also report that their professors integrate ICT into teaching; however, this integration relies mainly on basic tools such as laptops and data projectors rather than more advanced or interactive technologies. The study confirms that ICT integration remains constrained by both internal and external barriers. External barriers include technical problems, lack of equipment, limited access to resources, and insufficient institutional support. Internal barriers involve a lack of ICT competence, resistance to change, and the influence of age and gender. In addition, qualitative findings highlight context-specific challenges such as unreliable internet connectivity, electricity outages, and the digital divide among students. Despite

these challenges, students demonstrate generally positive attitudes toward ICT and recognize its significant role in improving learning processes. Nevertheless, a clear gap persists between the availability of ICT tools and their effective pedagogical integration. Overall, ICT in Moroccan higher education remains widely present in terms of access and use, but only partially integrated in terms of meaningful educational transformation.

LIMITATIONS

The present study is not without limitations. First, the use of a questionnaire limited the depth of qualitative insights. Second, the sample was restricted to one department, which limits the generalizability of the findings. Third, the reliance on self-reported data may introduce bias. Future research should include larger samples, multiple institutions, and more in-depth qualitative methods, such as interviews.

RECOMMENDATIONS

Policymakers should improve ICT infrastructure, ensure reliable internet access, and provide continuous training and professional development opportunities. Universities should offer consistent technical support, maintain equipment, and encourage ICT use through incentives. Professors should further develop their digital skills and explore more effective ways of integrating ICT into their teaching practices. Students should also enhance their digital literacy in order to benefit more fully from ICT in their learning.

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