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Two Worlds, One Classroom: Reciprocal Learning Between Digital Native Students and Digital Immigrant Professors in Moroccan EFL Higher Education

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ABSTRACT

The gap between digital natives and digital immigrants continues to widen as technology evolves, a divide particularly evident in higher education where digital immigrant professors and digital native students interact despite differing teaching and learning preferences. While prior research has examined technology integration in education, little is known about how EFL students and professors in Moroccan higher education perceive this integration and the reciprocal learning opportunities it creates. This study therefore investigated professors' perceptions of technology integration, the challenges they face, and what digital native students and digital immigrant professors can learn from one another. An exploratory mixed-methods design was used, involving 206 EFL students and 19 EFL professors from Moulay Ismail University, Morocco, who completed an online questionnaire with closed- and open-ended items. Quantitative data were analyzed using descriptive statistics, and qualitative responses through thematic analysis. Findings showed that despite challenges such as content overload, misinformation, distraction, and technical issues, both students and professors held positive perceptions of technology integration in EFL education. Results further indicated that digital native students can help professors develop technological skills and navigate digital tools, while digital immigrant professors can help students strengthen information evaluation skills, use traditional learning resources, adapt when technology fails, and value interpersonal communication. These findings underscore the importance of fostering reciprocal learning and collaborative professional development to enhance technology integration in higher education. However, the study was limited to a single university and relied on self-reported data; future research should include multiple institutions, larger samples, and longitudinal or experimental designs.

INTRODUCTION

Technology has transformed nearly every aspect of modern life, including education, by enhancing learning efficiency and providing faster and more accurate access to information. It has evolved from being merely a tool for everyday activities into a powerful resource that has significantly reshaped educational practices (Mete, Riegel, Kozen, & Polka, 2017). Consequently, today's students are widely regarded as the first generation to have grown up immersed in digital technologies, spending their lives surrounded by computers, smartphones, video games, and the internet.

Despite the widespread availability of educational technologies, their effective integration into classroom teaching remains a challenge. One of the primary barriers lies in the differing perceptions, experiences, and uses of technology among students and educators. These differences are often explained through the concepts of digital natives and digital immigrants. Digital native students are generally perceived as being comfortable with technology because they have been exposed to digital environments from an early age, whereas digital immigrant professors adopted technology later in life and may therefore encounter greater challenges when integrating it into their teaching. However, the stereotypes associated with these labels—such as assuming that digital natives are inherently technologically proficient while

digital immigrants are technologically reluctant—may hinder meaningful collaboration and reciprocal learning between the two groups (Riegel & Mete, 2017).

The rapid advancement of digital technologies has fundamentally changed the way students access, process, and communicate information. As a result, contemporary learners differ considerably from previous generations in their learning preferences and expectations. This transformation has led some scholars to argue that traditional educational systems were designed for learners with characteristics that no longer reflect those of today's students (Prensky, 2001). Furthermore, different life experiences can shape brain development and influence how individuals think, learn, and interact with information, suggesting that prolonged exposure to technology may also affect students' cognitive and learning processes.

Despite these changes, many digital immigrant educators continue to believe that today's students can be taught effectively using the same instructional approaches that were successful with previous generations. However, this assumption has become increasingly debatable as technological advancements continue to reshape students' learning habits, communication styles, and educational expectations. Consequently, an important question emerges: Should digital native students continue adapting to traditional teaching methods, or should digital

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immigrant professors embrace more contemporary, technology-enhanced pedagogical practices? Although the distinction between digital natives and digital immigrants has attracted considerable scholarly attention, relatively little research has examined how these two groups perceive technology integration within Moroccan EFL higher education or how they can mutually benefit from each other's knowledge and experiences. Addressing this gap is important for fostering collaborative learning environments and promoting more effective technology integration. Therefore, the present study investigates professors' perceptions of technology integration, the challenges they encounter, and the reciprocal learning opportunities that exist between digital native students and digital immigrant professors in Moroccan higher education.

LITERATURE REVIEW

The integration of digital technologies has significantly transformed teaching and learning, making it essential to understand how students and educators engage with technology. In this context, the concepts of digital natives, digital immigrants, and digital fluency offer valuable insights into technology use in education. This section reviews the relevant literature on these concepts to provide the conceptual foundation for the present study.

Digital Fluency

Digital fluency refers to an individual's ability to use digital technologies effectively, confidently, and purposefully. It has been described through several related concepts, including digital literacy (Gilster, 1997), computer literacy (Ktoridou & Eteokleous-Grigoriou, 2011), information technology literacy (Ferro *et al.*, 2011), computer self-efficacy (Compeau & Higgins, 1995), and information and communication technology (ICT) competency (Guo *et al.*, 2008). Although these terms are often used interchangeably, Wang *et al.* (2012) argue that digital fluency is the most appropriate concept for distinguishing digital natives from digital immigrants. According to the National Research Council (1999), digital fluency extends beyond understanding information to include the ability to create, reorganize, and communicate knowledge responsibly and creatively through technology. Therefore, unlike digital literacy, which focuses primarily on basic technological skills, digital fluency emphasizes the meaningful and effective use of technology to support learning, communication, and innovation (Papert & Resnick, 1995).

Digital Natives and Digital Immigrants

The rapid advancement of digital technology has created a generational divide between individuals who grew up with technology and those who encountered it later in life, giving rise to the concepts of digital natives and digital immigrants (Sharma, 2017). This distinction reflects differences in technological experiences and

usage patterns across generations, making these concepts increasingly relevant in educational research (Arabaci & Polat, 2013). The term digital native (DN), popularized by Prensky (2001) and Tapscott (1998), refers to individuals born into the digital era who have been exposed to information and communication technologies (ICT) from an early age. Consequently, digital natives are generally characterized by their confidence, familiarity, and ease in using digital technologies (Gallardo-Echenique, Marques-Molas, Bullen, & Strijbos, 2015). According to Barbuceanu (2020), they are able to communicate, collaborate, and access information through a wide range of digital platforms, while Howe and Strauss (2003) describe them as technologically skilled, collaborative, and achievement-oriented.

In contrast, digital immigrants (DI) are individuals who were introduced to digital technologies later in life and therefore may experience greater difficulty adapting to technological change (Cimen & Hangul, 2021). Although many digital immigrants have successfully acquired digital skills, their patterns of technology use often differ from those of digital natives. They are generally more likely to rely on traditional sources of information and may demonstrate greater hesitation when adopting emerging technologies (Wang, Myers, & Sundaram, 2013). As noted by Vodanovich *et al.* (2010), digital immigrants are often perceived as less receptive to technological innovation, reflecting the different technological environments in which they were raised.

DN and DI Types

Digital native students differ considerably in the extent to which they engage with and use digital technologies. Based on their level of technological engagement, they can be classified into three categories: avoiders, minimalists, and passionate users (Zur, 2011). Avoiders show little interest in digital technologies and rarely use social media or other online platforms. Minimalists recognize the importance of technology but use it only when necessary for specific tasks, such as searching for information or accessing online services. In contrast, passionate users enthusiastically embrace technology and spend a significant amount of time interacting with digital platforms, social media, and online content. Similarly, digital immigrant professors vary in their willingness to adopt and integrate technology into their professional lives. Zur (2011) categorizes them into three groups: avoiders, reluctant adopters, and passionate adopters. Avoiders deliberately minimize their use of digital technologies and prefer traditional methods of communication and instruction. Reluctant adopters use technology only when required and often approach digital tools with caution and hesitation. Conversely, passionate adopters actively embrace technological innovations, integrate digital tools into their teaching practices, and encourage students to use technology and social media to support learning.

DN and DI Characteristics

Digital native students are characterized by their lifelong exposure to technology, which enables them to integrate digital tools naturally into their daily and academic lives (Bilgic, Seferoglu, & Dogan, 2016). Their continuous interaction with technology, both inside and outside the classroom, allows them to access information efficiently, collaborate with peers, and complete various academic tasks using digital resources (Gu, Zhu, & Guo, 2013). Compared with digital immigrants, digital natives are generally comfortable multitasking, remaining constantly connected, and processing information rapidly. They also tend to prefer visually rich learning environments, favoring graphics, videos, charts, and images over text-heavy materials. Furthermore, they value collaboration and actively engage in sharing ideas and interacting with others through digital platforms.

In contrast, digital immigrant professors adopted technology later in life and therefore tend to retain preferences shaped by more traditional educational practices (Helsper & Eynon, 2011). As Prensky (2001) explains, adapting to digital technologies is comparable to learning a second language rather than speaking it as a native. Consequently, digital immigrant professors often prefer face-to-face communication over online interactions, rely on printed books and scholarly publications rather than internet sources, and generally favor conventional teaching and learning approaches. These characteristics reflect their gradual adaptation to technology while maintaining many of the practices developed before the widespread use of digital technologies.

MATERIALS AND METHODS

This section details the methodological framework that guides this study. It establishes the credibility and trustworthiness of the research by providing a clear and transparent account of how the study is conducted. It describes the research approach, objectives, questions, the participants and sampling strategy, and the ethical considerations observed throughout the data collection process.

Research Problem

The rapid advancement of information and communication technology (ICT) has widened the generational gap in educational settings, where digital native students—who have grown up in technology-rich environments—interact with digital immigrant professors, who adopted digital technologies later in life (Prensky, 2001). While this dichotomy has been problematized in recent literature (e.g., Bennett *et al.*, 2008), it remains a useful heuristic for understanding intergenerational differences in technology use. Digital native students are often characterized as possessing greater technological proficiency and different learning preferences than previous generations, whereas digital immigrant professors tend to approach digital tools with varying

degrees of confidence and adaptability. These differences have raised concerns about whether traditional teaching practices adequately address the needs and expectations of contemporary learners. Although technology has become integral to higher education globally, no study to date has simultaneously examined how digital native students and digital immigrant professors in Moroccan EFL contexts perceive technology integration and the reciprocal learning opportunities that exist between them. Addressing this gap is essential; without empirical evidence, institutions risk implementing top-down technology policies that fail to leverage intergenerational collaboration, potentially perpetuating pedagogical mismatches, student disengagement, and underutilization of both digital fluency and content expertise.

Research Objectives

This study pursues the following objectives. The overarching aim is to explore the phenomenon of reciprocal learning between digital native students and digital immigrant professors in Moroccan EFL higher education. Specifically, the study seeks to:

- **RO1:** Interrogate digital immigrant professors' attitudes and perceptions regarding the incorporation of ICT into the pedagogical environment.
- **RO2:** Delineate the obstacles professors encounter in the process of integrating technology into their instructional practices.
- **RO3:** Elucidate the competencies and skills that digital native students can impart to digital immigrant professors with respect to technological proficiency.
- **RO4:** Elucidate the insights and competencies that digital immigrant professors can impart to digital native students beyond the realm of technology.

Research Questions

In line with the research objectives, this study addresses the following research questions

- **RQ1:** What attitudes and perceptions do digital immigrant professors hold regarding the incorporation of ICT into the pedagogical environment?
- **RQ2:** What obstacles do professors encounter in the process of integrating technology into their instructional practices?
- **RQ3:** What competencies and skills can digital native students impart to digital immigrant professors with respect to technological proficiency?
- **RQ4:** What insights and competencies can digital immigrant professors impart to digital native students beyond the realm of technology?

Research Approach

This study adopted an exploratory mixed-methods research approach, integrating both quantitative and qualitative data collection and analysis techniques. A mixed-methods design was deemed most appropriate for this investigation because the research problem involves both measurable perceptions (e.g., levels of agreement

with technology integration) and complex, subjective experiences (e.g., challenges faced and reciprocal learning opportunities). As Creswell and Plano Clark (2018) argue, mixed-methods research is particularly suited for educational inquiries where human behavior, attitudes, and contextual factors interact in multifaceted ways.

The exploratory nature of this approach aligns with the study's overarching aim. Given that little is known about how Moroccan EFL students and professors perceive technology integration and reciprocal learning, an exploratory design allowed the researchers to uncover patterns, generate insights, and develop a nuanced understanding of the phenomenon without imposing rigid preconceived categories. This design is consistent with the pragmatic epistemological stance underpinning mixed-methods research, which prioritizes practical problem-solving over strict adherence to a single philosophical paradigm (Creswell & Plano Clark, 2018). The quantitative strand served to identify broad trends and generalizable patterns in participants' perceptions of technology integration, including the frequency and intensity of agreement with various statements. The qualitative strand complemented this by capturing participants' lived experiences, the specific challenges they encountered, and the rich, contextual details of reciprocal learning interactions that cannot be adequately measured through closed-ended items alone. By integrating both strands, the study achieved triangulation (convergence of findings from different sources), complementarity (illuminating different facets of the same phenomenon), and expansion (extending the breadth and depth of the inquiry) (Greene, Caracelli, & Graham, 1989).

Participants and Sampling Strategy

This study employed a purposive sampling strategy to select participants based on specific characteristics relevant to the research objectives. Two inclusion criteria guided participant selection: participants had to be affiliated with EFL education at Moulay Ismail University (either as students or professors), and they had to be active users of social media and digital technologies. These criteria ensured that all respondents possessed direct, firsthand experience with technology integration in EFL contexts and could therefore provide meaningful insights into the reciprocal learning opportunities between digital native students and digital immigrant professors. By selecting only information-rich cases, the sampling strategy ensured data relevance and alignment with the research questions.

The final sample consisted of 206 EFL students and 19 EFL professors from Moulay Ismail University, Morocco. Professors received the online questionnaire via institutional email, while students received it through social media platforms, reflecting the different communication channels appropriate for each group. This dual recruitment approach ensured maximum reach while respecting the distinct contexts of professors and students. The sample size reflects the typical student-

to-faculty ratio in higher education institutions and is appropriate for an exploratory mixed-methods study, providing sufficient quantitative data for descriptive analysis and rich qualitative data from open-ended responses.

Ethical Considerations

This study adhered to established ethical principles for research involving human participants. Informed consent was obtained from all participants through a preamble at the beginning of the online questionnaire, which clearly explained the study's purpose, procedures, and participants' rights. Participation was entirely voluntary, and respondents were informed that they could withdraw at any time without penalty.

To protect participant privacy, no identifying information such as names, email addresses, or IP addresses was collected. All data were stored on password-protected devices accessible only to the research team. Participants were assured that their responses would remain anonymous and would be reported in aggregate form, with no individual respondents identifiable in any publications. Special consideration was given to the professor-student dynamic; students were assured that their responses would not be shared with their professors or affect their academic standing, and professors were assured that their responses would not be used for evaluative purposes. The online format further reduced potential coercion, as participants could complete the questionnaire privately and at their convenience. All open-ended responses were carefully anonymized during the analysis phase.

Data Analysis and Interpretation

This section presents a comprehensive analysis and interpretation of the data collected through two online questionnaires administered to EFL students and professors at Moulay Ismail University, Morocco. The first questionnaire, designed for student participants, is organized into three distinct subsections: a demographic analysis examining the background characteristics of the student sample, a quantitative analysis exploring students' perceptions and experiences of technology integration, and a qualitative analysis eliciting students' perspectives on the knowledge and skills they can impart to digital immigrant professors. The second questionnaire, designed for professor participants, is structured around two subsections: a quantitative analysis investigating professors' perceptions of and attitudes toward technology-based teaching, and a qualitative analysis probing the challenges they encounter and the reciprocal learning opportunities that exist between themselves and their digital native students. Together, these two instruments generate a rich and multifaceted dataset that enables a thorough examination of the phenomenon of reciprocal learning between digital native students and digital immigrant professors within the Moroccan EFL higher education context.

Analysis and Interpretation of Student Data

This section presents an analysis of the data gathered from 206 EFL students at Moulay Ismail University, Morocco. The analysis is organized into three subsections: a demographic analysis profiling the student sample, a quantitative analysis examining students' perceptions of technology integration in the EFL classroom, and a qualitative analysis exploring the knowledge and skills digital native students believe they can impart to digital

Table 1: Gender Distribution of the Participants

Gender	Frequency (F)	Percentage (%)
Male	111	53.9
Female	95	46.1
Total	N = 206	100.0

immigrant professors.

A total of 206 EFL students from Moulay Ismail University successfully completed the online questionnaire, including 95 female students (46.1%) and 111 male students (53.9%). These demographic characteristics are presented in Table 1. The relatively balanced gender distribution provides perspectives from both male and female participants, contributing to a more comprehensive understanding of EFL students' perceptions of technology integration. This balanced representation also enhances the credibility of the findings by reducing the likelihood that the results

Table 2: Gender Distribution of the Participants

Age Group	Frequency (F)	Percentage (%)
Below 20 years	58	28.2
20-25 years	98	47.5
Above 25 years	50	24.3
Total	N = 206	100.0

are disproportionately influenced by one gender.

Participants represented a diverse range of age groups, as shown in Table 2. Of the 206 respondents, 58 (28.2%) were under the age of 20, 98 (47.6%) were between 20 and 25 years old, and 50 (24.3%) were over the age of 25. The majority of participants fell within the 20–25 age bracket, suggesting that the sample predominantly comprised young adults typically enrolled in higher education. Nevertheless, the inclusion of participants across multiple age groups enriches the dataset by capturing a broader spectrum of students' experiences and perceptions regarding technology integration, thereby reflecting the heterogeneity that characterizes the contemporary digital native generation.

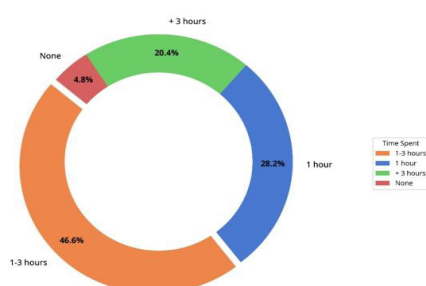


Figure 1: Daily Time Spent on Technology-Based Learning

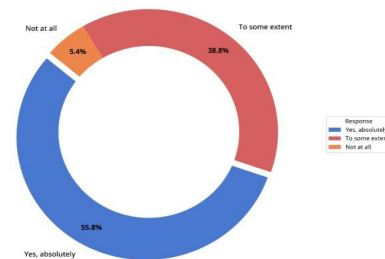


Figure 2: Enjoyment Level of Technology-Based Learning

Quantitative Analysis

The majority of EFL students reported engaging in technology-based learning on a daily basis, underscoring the extent to which digital technologies have become embedded in their academic routines. As illustrated in Figure 1, 96 students (46.6%) engaged in technology-based learning for one to three hours daily, representing the largest proportion of the sample. In comparison, 58 students (28.2%) reported spending approximately one hour per day, while 42 students (20.4%) indicated dedicating more than three hours to technology-based learning daily. Notably, only 10 students (4.8%) reported no engagement in technology-based learning whatsoever. Collectively, these findings suggest that technology-based learning has become an integral component of EFL students' academic experiences, highlighting the prominent role of digital technologies in supporting learning and reinforcing the increasing integration of technology into higher education.

EFL students demonstrated overwhelmingly positive attitudes toward the integration of technology into the learning process. As depicted in Figure 2, 115 students (55.8%) reported fully enjoying technology-enhanced learning, while 80 students (38.8%) indicated that they enjoyed it to some extent. In contrast, only 11 students (5.4%) expressed a lack of enjoyment toward technology-mediated learning. Collectively, these findings indicate that the vast majority of EFL students hold favorable perceptions of technology integration, reflecting a strong preference for technology-supported learning environments. This positive disposition underscores the growing importance of digital tools in contemporary EFL education and suggests that incorporating technology into instructional practices can enhance students' engagement

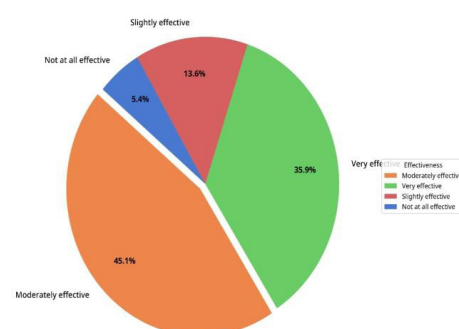


Figure 3: Perceived Effectiveness of Technology-Based Learning

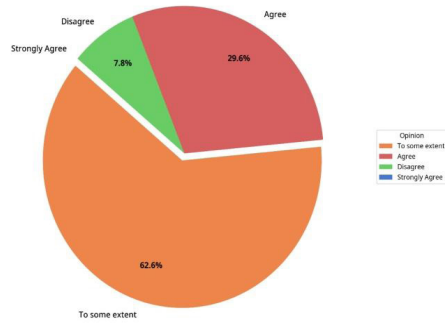


Figure 4: Preference for Technology-Based vs. Traditional Learning

and contribute to a more interactive and meaningful learning experience.

EFL students largely perceived technology as a valuable asset in supporting their academic progress. As illustrated in Figure 3, the majority of respondents acknowledged the positive contribution of digital tools to their learning outcomes, with 93 students (45.2%) considering technology to be somewhat helpful, representing the largest proportion of the sample. Furthermore, 74 students (35.9%) reported that technology had been extremely helpful to their academic development, while 28 students (13.6%) perceived its contribution as marginal. Notably, only 11 students (5.3%) indicated that technology had yielded no discernible benefit whatsoever to their academic progress. Taken together, these findings paint a compelling picture of technology as a widely acknowledged and indispensable pedagogical resource, with an overwhelming majority of EFL students recognizing its capacity to enhance learning outcomes. This pattern further corroborates the notion that digital native students not only engage extensively with technology but also attribute considerable educational value to its integration, thereby reinforcing the case for sustained and purposeful incorporation of digital tools within EFL higher education contexts.

Despite their broadly positive orientations toward technology integration, EFL students demonstrated a clear preference for preserving traditional classroom instruction. As shown in Figure 4, an overwhelming majority of 129 students (62.6%) opposed the outright replacement of face-to-face instruction with technology-based learning, while only 61 students (29.6%) expressed support for such a transition. A further 16 students (7.8%) indicated partial disagreement with the proposition. These findings reveal a nuanced and sophisticated stance among EFL students, one that resists a reductive dichotomy between traditional and digital modes of instruction. Rather than advocating for the wholesale substitution of conventional pedagogical practices, students appear to favor a blended learning paradigm that strategically harnesses the complementary strengths of both face-to-face interaction and technology-enhanced instruction. This preference not only challenges the assumption that digital native students inherently favor fully technology-mediated learning environments but also underscores

the enduring pedagogical significance of interpersonal communication and direct instructor engagement in the EFL classroom.

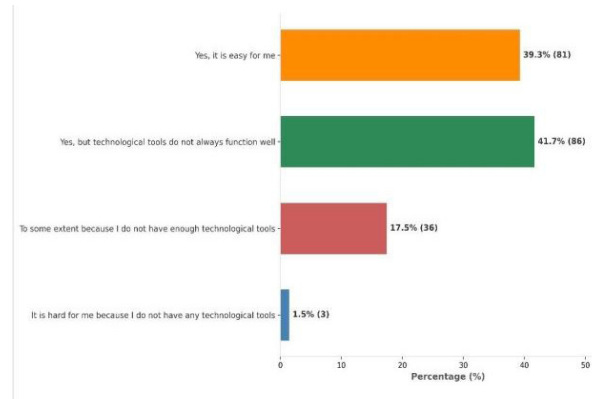


Figure 5: Access to Technological Tools

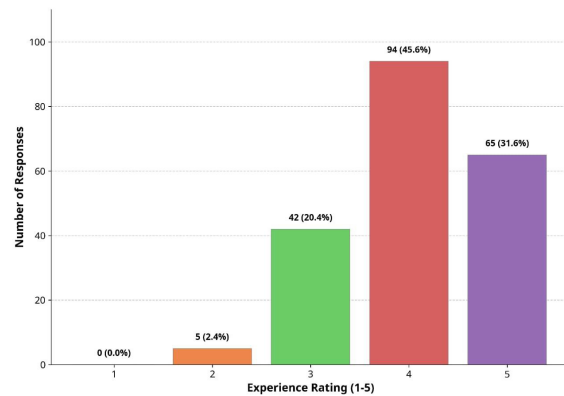


Figure 6: Level of Technology Experience

Access to technological tools emerged as a moderately favorable yet nuanced aspect of EFL students' digital learning experience. As illustrated in Figure 5, 86 students (41.7%) — representing the largest proportion of the sample — reported generally adequate access to technological tools, albeit with occasional technical difficulties and limitations. Furthermore, 81 students (39.3%) indicated having consistently easy and unimpeded access to technological resources, reflecting a considerable degree of digital readiness among the student population. Conversely, 36 students (17.5%) reported encountering significant difficulties in accessing technological tools due to limited availability, while 3 students (1.5%) indicated having no access to technological tools whatsoever, pointing to persistent infrastructural disparities within the learning environment. Taken together, these findings suggest that while the majority of EFL students enjoy relatively satisfactory access to digital resources, technical constraints and infrastructural limitations continue to pose considerable challenges for a non-negligible proportion of learners. These disparities underscore the critical importance of ensuring equitable and reliable access to technological tools as a prerequisite for effective and inclusive technology-enhanced learning in EFL higher education contexts.

EFL students demonstrated a notably high level of

technological experience, reflecting their deep immersion in digital environments from an early age. As illustrated in Figure 6, the largest proportion of respondents, comprising 94 students (45.6%), reported possessing good technological experience, while 65 students (31.6%) characterized their experience as excellent, collectively accounting for over three quarters of the sample. A further 42 students (20.4%) described their technological experience as average, suggesting a foundational level of digital competence sufficient for engaging with technology-enhanced learning environments. Remarkably, only five students (2.4%) reported having limited experience with technology, representing a negligible minority within the sample. Taken together, these findings paint a compelling portrait of a technologically proficient student cohort, one that possesses the requisite digital skills and competencies to engage effectively and confidently with technology-based learning. This pervasive technological competence not only underscores students' readiness to leverage digital tools in support of their academic pursuits but also reinforces their characterization as digital natives who are inherently equipped to navigate and exploit the affordances of contemporary digital learning environments.

Qualitative Analysis

The remaining section of the questionnaire comprised open-ended questions designed to elicit EFL students' perspectives on the knowledge and skills they could impart to digital immigrant professors. The qualitative responses were subjected to thematic analysis, unveiling a rich array of recurring insights pertaining to students' potential contributions to technology integration in higher education.

A substantial proportion of participants expressed the conviction that they could play a pivotal role in supporting digital immigrant professors in integrating technology more effectively and meaningfully into their instructional practices. Students consistently emphasized that the incorporation of digital tools — such as educational applications, multimedia resources, online platforms, and gamified activities — has the capacity to render learning considerably more engaging, interactive, and intrinsically motivating. One participant remarked, "We can teach our professors how to use technology in a way that makes learning more enjoyable and interactive." Another student commented, "Professors should use more educational applications, videos, and online quizzes because they make students more motivated to learn." Similarly, another respondent stated, "Technology helps students participate more actively in class, especially when interactive activities and games are included." These responses collectively suggest that students perceive themselves as active and capable agents in facilitating professors' adoption of more innovative, technology-enhanced pedagogical practices, thereby fostering a more dynamic, inclusive, and student-centered learning environment that aligns with the evolving demands of

contemporary higher education.

Analysis and Interpretation of Professor Data

This section presents an analysis of the data gathered from EFL professors at Moulay Ismail University, Morocco. Although the questionnaire was distributed to all 25 professors within the department, only 19 professors completed and returned it, yielding a response rate of 76%. The analysis is organized into two subsections: a quantitative analysis examining professors' perceptions of and attitudes toward technology-based teaching, and a qualitative analysis exploring the challenges they encounter and the reciprocal learning opportunities that exist between digital immigrant professors and digital native students.

Quantitative Analysis

EFL professors demonstrated predominantly favorable

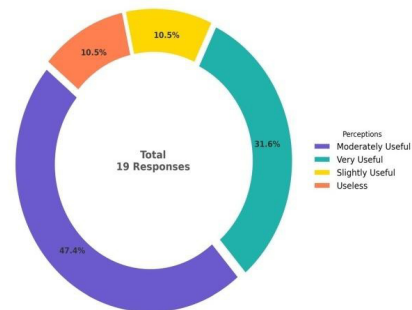


Figure 7: Effectiveness of Technology-Based Teaching

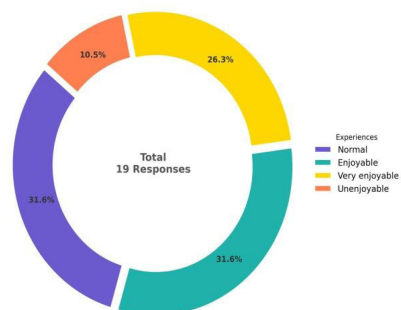


Figure 8: Effectiveness of Technology-Based Teaching

perceptions of the effectiveness of technology-based teaching, albeit with notable variation in the degree of appreciation expressed across the sample. As shown in Figure 7, nearly half of the respondents, comprising 9 professors (47.4%), considered technology-based teaching to be moderately useful, representing the largest proportion of the sample. Furthermore, 6 professors (31.6%) perceived it as very useful, reflecting a strong and meaningful appreciation of its pedagogical value in the EFL instructional context. In contrast, equal proportions of respondents, accounting for 2 professors each (10.5%), regarded technology-based teaching as either slightly useful or entirely ineffective, suggesting that a minority of professors harbor reservations regarding its overall effectiveness. Taken together, these findings paint

a nuanced portrait of EFL professors as a cohort that is broadly receptive to technology-based teaching while simultaneously exercising a degree of critical discernment regarding its pedagogical merits. The persistence of less favorable perceptions among a small yet non-negligible proportion of respondents underscores the imperative for sustained and targeted professional development initiatives, as well as robust institutional support mechanisms, to facilitate the successful and meaningful integration of technology into EFL instructional practices at the higher education level.

EFL professors reported predominantly positive experiences with technology-based teaching, reflecting a general sense of satisfaction and receptivity toward digital instruction. The data presented in Figure 8 reveal that equal proportions of respondents, comprising 6 professors each (31.6%), described their experience as normal and enjoyable respectively, collectively representing the largest share of the sample. Furthermore, 5 professors (26.3%) characterized their experience with technology-based teaching as very enjoyable, indicating a remarkably high level of satisfaction among a considerable proportion of the sample. In contrast, a mere 2 professors (10.5%) described their experience as unenjoyable, representing a negligible minority within the sample. On the whole, these findings suggest that the overwhelming majority of EFL professors have had positive or, at minimum, satisfactory encounters with technology-based teaching, underscoring a prevailing sense of openness and adaptability toward digital instructional practices. This broadly favorable experiential landscape not only signals a genuine willingness among professors to engage with and embrace digital technologies but also provides a promising foundation for the continued and more deeply embedded integration of technology into EFL teaching practices within the Moroccan higher education context.

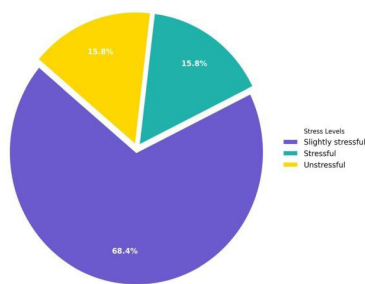


Figure 9: Stress Level of Technology-Based Teaching

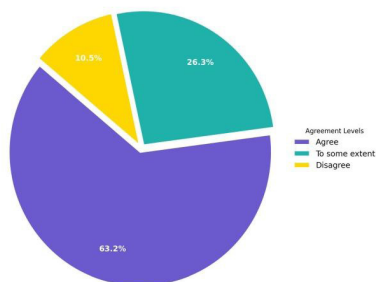


Figure 10: Preference for Blended and Technology-Based Teaching

EFL professors reported relatively manageable levels of stress associated with technology-based teaching, suggesting a reasonable degree of adaptation to the demands of digital instruction. The data depicted in Figure 9 reveal that the majority of respondents, comprising 13 professors (68.4%), considered technology-based teaching to be slightly stressful, indicating that while it presents certain inherent challenges, these are generally perceived as surmountable rather than overwhelming. Furthermore, equal proportions of respondents, accounting for 3 professors each (15.8%), described their experience as either stressful or unstressful, reflecting the heterogeneity of individual experiences and varying degrees of comfort with technology integration among the sample. Remarkably, none of the respondents perceived technology-based teaching as very stressful, a finding that speaks volumes about the overall resilience and adaptability of the professor cohort in navigating the complexities of digital instruction. Viewed in their entirety, these findings suggest that while technology-based teaching may introduce a moderate degree of stress for a considerable proportion of professors, it is by no means perceived as an insurmountable or debilitating burden. The conspicuous absence of responses in the “very stressful” category further corroborates the notion that most EFL professors have acclimated reasonably well to the integration of technology into their instructional practices, a testament to their growing professional competence in the digital domain.

EFL professors demonstrated a predominantly favorable disposition toward the adoption of blended learning as an alternative to exclusively traditional teaching practices. A closer examination of Figure 10 reveals that the majority of respondents, comprising 12 professors (63.2%), expressed agreement with adopting blended learning, indicating a broadly positive attitude toward the strategic combination of face-to-face instruction and technology-based teaching. Furthermore, 5 professors (26.3%) indicated agreement to some extent, reflecting a moderate yet meaningful level of support for this innovative instructional approach. In contrast, a mere 2 professors (10.5%) expressed disagreement, representing a negligible minority within the sample. Notably, none of the respondents endorsed the complete replacement of traditional teaching with technology-based instruction, underscoring a prevailing preference for a balanced and integrative pedagogical model. Considered together, these findings suggest that EFL professors favor a judicious and measured integration of technology into conventional classroom instruction, rather than an unconditional reliance on either traditional or exclusively technology-based teaching methodologies. This pronounced preference for blended learning not only highlights its perceived value as a balanced and effective pedagogical paradigm within EFL higher education but also reinforces the notion that technology is most effectively leveraged as a complement to, rather than a substitute for, established instructional practices.

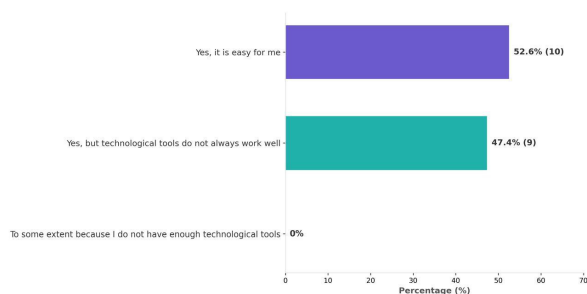


Figure 11: Access to Technological Tools

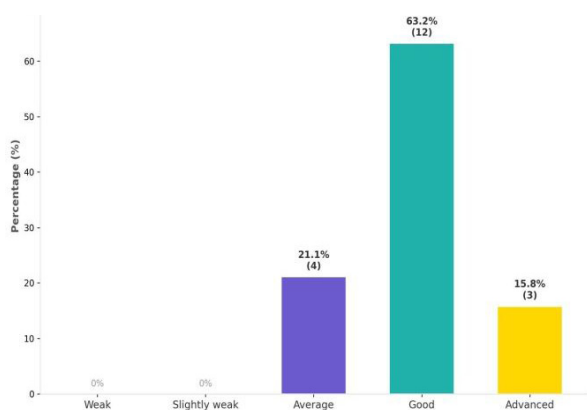


Figure 12: Level of Technology-Based Teaching Experience

EFL professors reported a generally high level of access to technological tools, reflecting a relatively well-equipped instructional environment. The findings presented in Figure 11 indicate that 10 professors (52.6%) reported having consistently easy and unimpeded access to technological tools, representing the largest proportion of the sample. In contrast, 9 professors (47.4%) indicated that while they generally had access to technological resources, they occasionally encountered technical difficulties that impeded their effective utilization. Remarkably, none of the respondents reported limited access attributable to an insufficient availability of technological tools, suggesting that infrastructural provision is not a primary barrier to technology integration within this particular institutional context. When examined holistically, these findings suggest that EFL professors enjoy a comparatively high level of access to technological resources, a finding that bodes well for the continued integration of technology into instructional practices. Nevertheless, the considerable proportion of professors who reported recurring technical difficulties underscores the pressing need to enhance the reliability, functionality, and maintenance of technological infrastructure, as persistent technical disruptions risk undermining the effectiveness and consistency of technology-based teaching in the EFL higher education context.

EFL professors demonstrated a notably positive self-assessment of their overall experience with technology-based teaching, reflecting a broad sense of confidence and competence in navigating digital instructional practices. Drawing on the data displayed in Figure 12, the majority of respondents, comprising 12 professors

(63.2%), rated their experience as good, indicating that most professors perceive themselves as possessing a solid and reliable level of competence in integrating technology into their teaching practices. Furthermore, 4 professors (21.1%) assessed their experience as moderate, suggesting a foundational yet functional degree of technological proficiency, while 3 professors (15.8%) considered themselves to possess an advanced level of experience, reflecting a commendable degree of digital mastery within the sample. Remarkably, none of the respondents rated their experience as weak or slightly weak, a finding that speaks to the overall technological preparedness of the professor cohort. In aggregate, these findings suggest that EFL professors generally perceive themselves as sufficiently and confidently experienced in technology-based teaching, reflecting a high level of professional readiness to incorporate digital technologies into classroom instruction. This overwhelmingly positive self-assessment further corroborates the notion that technology integration has evolved into an established and indispensable component of their pedagogical repertoire, signaling a promising trajectory for the sustained advancement of technology-enhanced instruction in Moroccan EFL higher education.

Qualitative Analysis

The remaining section of the questionnaire comprised open-ended questions designed to elicit EFL professors' perspectives on the knowledge and skills they could impart to digital native students, as well as the obstacles they encounter when integrating technology into their instructional practices. The qualitative responses were subjected to thematic analysis, unveiling several significant and recurring themes.

A considerable number of professors emphasized the paramount importance of acquainting digital native students with traditional sources of information, including books, academic journals, and peer-reviewed scholarly articles. They maintained that while students demonstrate remarkable proficiency in locating information online, they frequently underestimate the credibility, rigor, and intellectual depth afforded by conventional academic resources. As one professor noted, "Students rely heavily on the internet, but they should also learn how to use books and academic journals because they provide more reliable information." Another respondent aptly remarked, "Technology is useful, but it should complement, not replace, traditional sources of knowledge." These responses collectively underscore the perceived necessity of cultivating a balanced and critically informed approach to information literacy among digital native students.

Another recurrent and significant contribution identified by professors pertained to fostering independent learning strategies in the absence of technological resources. Having completed their academic formation prior to the widespread proliferation of digital technologies, professors articulated that they had cultivated robust

learning strategies that operated independently of internet access or digital devices. Consequently, they expressed a strong conviction that they could equip students with the resilience and adaptability required to remain academically productive when technological resources prove unavailable or unreliable. As one participant explained, “Students should know how to continue learning even when there is no internet or when technological tools stop working.” This finding highlights the enduring pedagogical value of technology-independent learning competencies in an increasingly digitally dependent academic landscape.

Professors further underscored the irreplaceable significance of interpersonal communication in the learning process. Many expressed profound concern that students’ pervasive and extensive engagement with digital devices has progressively eroded opportunities for meaningful face-to-face interaction and the organic development of interpersonal communication skills. They articulated a strong belief in their capacity to help students recognize and appreciate the educational value of classroom discussions, body language, facial expressions, tone of voice, and other nuanced forms of non-verbal communication that digital interfaces are inherently incapable of replicating. As one professor remarked, “Technology cannot replace the human interaction that takes place in a classroom.” This perspective reinforces the enduring pedagogical significance of direct human engagement as an indispensable dimension of effective EFL instruction.

Concerning the challenges associated with technology integration, technical difficulties emerged as one of the most pervasive and frequently reported concerns among the sample. Professors consistently indicated that unreliable internet connectivity, recurrent software malfunctions, and hardware failures constituted significant and recurring disruptions to their instructional activities. One respondent observed, “The biggest challenge is that technology does not always work when you need it, especially during online classes.” These technical impediments not only undermine the continuity and effectiveness of technology-based teaching but also contribute to elevated levels of professional frustration among educators.

Distraction was similarly identified as a pervasive and consequential challenge by a considerable proportion of respondents. Professors acknowledged that the ubiquitous presence of technology and social media platforms creates fertile conditions for the diversion of both instructors’ and students’ attention during pedagogical activities, rendering the maintenance of sustained concentration and active engagement increasingly arduous. As one participant stated, “Notifications and social media can easily distract students and reduce their focus during class.” This finding highlights the inherent paradox of technology integration, wherein the very tools designed to enhance learning simultaneously possess the capacity to undermine it.

Finally, a significant number of professors identified the proliferation of misinformation and content overload as formidable obstacles to effective technology-based teaching. They articulated that the overwhelming and largely unregulated volume of information available online renders it increasingly difficult for students to critically distinguish credible and academically rigorous sources from inaccurate, misleading, or intellectually superficial content. As one professor commented, “There is so much information online that students often struggle to identify what is credible and academically useful.” In aggregate, these findings demonstrate that while professors unequivocally recognize the considerable educational value of technology, they simultaneously remain acutely cognizant of the multifaceted pedagogical and technical challenges that inevitably accompany its integration into the higher education environment, underscoring the imperative for comprehensive institutional support and sustained professional development in this domain.

Main Findings

- EFL students demonstrated positive attitudes toward technology-based learning, emphasizing its flexibility, accessibility, and contribution to academic progress.
- Students preferred blended learning over the complete replacement of traditional instruction, underscoring the enduring value of face-to-face interaction.
- Both students and professors reported adequate access to technological resources and sufficient competence to support effective teaching and learning.
- Professors perceived technology-based teaching favorably, describing it as effective, enjoyable, and only marginally stressful, and expressed support for blended learning.
- Students believed they could assist digital immigrant professors in enhancing technology integration through innovative digital tools and interactive strategies.
- Professors identified recurring challenges associated with technology integration, including technical difficulties, distraction, content overload, and misinformation.
- Professors expressed a conviction in their capacity to cultivate stronger information literacy among digital native students, foster learning resilience, and reinforce the value of interpersonal communication.

RESULTS AND DISCUSSION

The present study examined the perceptions of EFL students and professors regarding technology integration in higher education and explored the reciprocal learning opportunities that exist between digital natives and digital immigrants. On the whole, the findings indicate that both groups harbor positive attitudes toward technology-based learning and teaching, notwithstanding their acknowledgment of several technical and pedagogical challenges. Rather than constituting opposing or incompatible groups, the findings compellingly suggest that digital natives and digital immigrants possess

complementary strengths that, when effectively harnessed, have the capacity to significantly enhance the educational process.

The overwhelming majority of EFL students perceived technology-based learning as flexible, accessible, and conducive to their academic progress. Nevertheless, they demonstrated a pronounced preference for blended learning over the outright replacement of traditional classroom instruction, thereby recognizing the enduring and irreplaceable pedagogical significance of face-to-face interaction. Similarly, professors reported predominantly positive experiences with technology-based teaching and readily acknowledged its instructional effectiveness, while simultaneously identifying persistent challenges encompassing technical difficulties, distraction, content overload, and exposure to misinformation. These findings collectively underscore that successful technology integration is contingent not solely upon favorable attitudes but equally upon the provision of adequate technological infrastructure and the cultivation of effective and contextually responsive pedagogical practices.

The qualitative findings further illuminated the richness and reciprocity of the knowledge both groups possess. Students expressed a strong conviction in their capacity to support professors in integrating technology more effectively through the introduction of innovative and interactive digital tools and engagement-oriented pedagogical strategies. Conversely, professors emphasized their pivotal role in cultivating students' capacity to critically evaluate and utilize credible academic sources, maintain academic productivity in the absence of technological resources, and develop a deeper appreciation for the irreplaceable value of interpersonal communication in the learning environment. These findings powerfully highlight that effective technology integration ought to be reconceptualized as an inherently collaborative and mutually enriching process, wherein students and professors engage in continuous and meaningful reciprocal learning.

These findings carry several significant practical implications for higher education institutions. Universities should sustain and expand their commitment to blended learning, strategically invest in reliable and robust technological infrastructure, and provide continuous and targeted professional development opportunities that empower professors to integrate technology meaningfully and effectively into their instructional practices. Simultaneously, institutions should actively cultivate and incentivize collaborative partnerships between students and professors, recognizing and leveraging the complementary digital fluency and pedagogical expertise that each group uniquely contributes to the learning environment.

Notwithstanding its contributions, the present study is subject to several notable limitations. The research was confined to a single Moroccan university and relied exclusively on self-reported questionnaire data, factors that may collectively circumscribe the generalizability of the findings beyond the immediate institutional context. Consequently, future investigations should encompass

larger, more diverse, and geographically distributed samples drawn from multiple institutions, and should employ longitudinal or comparative research designs to rigorously examine how perceptions of technology integration evolve and transform across varied educational contexts and cultural settings.

CONCLUSION

The present study examined EFL students' and professors' perceptions of technology integration in higher education and explored the reciprocal learning opportunities that exist between digital natives and digital immigrants. The findings revealed that both groups generally harbor positive attitudes toward technology-based learning and teaching, consistently recognizing its considerable potential to enhance engagement, flexibility, and academic performance. Simultaneously, participants candidly acknowledged several persistent challenges — encompassing technical difficulties, distraction, content overload, and exposure to misinformation — that may collectively impede the effective and sustainable integration of technology into contemporary educational settings.

A particularly significant contribution of the present study resides in its compelling demonstration that the relationship between digital natives and digital immigrants ought not to be perceived as an insurmountable divide but rather reconceptualized as a profound and mutually enriching opportunity for reciprocal learning. While students are uniquely positioned to support professors in adopting innovative digital tools and implementing interactive and engagement-oriented teaching strategies, professors are equally equipped to cultivate students' critical information literacy, foster learning resilience and adaptability, and reinforce the enduring value of interpersonal communication skills. Consequently, truly effective technology integration necessitates genuine and sustained collaboration between both groups, rather than an exclusive or disproportionate reliance on the technological expertise of either party alone.

On the whole, the present study underscores the paramount importance of promoting blended learning paradigms, strengthening digital infrastructure, and nurturing collaborative learning environments in which students and professors engage in continuous and meaningful mutual enrichment. By recognizing, valorizing, and strategically leveraging the complementary strengths that digital natives and digital immigrants each bring to the educational encounter, higher education institutions are well positioned to cultivate more inclusive, dynamic, engaging, and ultimately sustainable technology-enhanced learning environments that adequately address the evolving demands of contemporary higher education.

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