Advancing autonomy in Tunisian higher education: Exploring the role of technology in empowering learners

Mimoun Melliti,   *Mansour* Henchiri

University of Kairouan, Route périphérique, Dar El Amen, Kairouan, 3100, Tunisia

Abstract. This study explores technology-based learner autonomy in Tunisian higher education, focusing on the Raqqada English department. It examines student engagement with technology-driven learning and the challenges faced by educators, highlighting a gap between students' theoretical readiness for self-directed learning and their actual use of digital tools. Utilising a mixed-methods approach, quantitative data were collected from 102 English students via questionnaires, and qualitative data from interviews with 25 educators. Findings reveal that while 80% of students engage in autonomous learning outside the classroom, in-class technology usage is significantly lower, indicating a disconnect with existing infrastructure. Furthermore, 76% of students acknowledge technology's role in supporting diverse learning styles, and 67% link smart classrooms to increased motivation. However, challenges such as limited digital literacy, inadequate training, and poor infrastructure hinder effective technology integration. Educators expressed concerns about rigid teaching methods and insufficient autonomy at earlier educational levels, suggesting that autonomy is better developed at the master's level. The study concludes that enhancing infrastructure, training, and digital resource availability is crucial for advancing learner autonomy. Recommendations include fostering intercultural collaboration through programs like Collaborative Online International Learning (COIL) and implementing varied assessment methods to evaluate learner autonomy better. Additionally, professional development programs for educators and students are necessary to promote autonomy and active learning strategies.

Keywords: learner autonomy, technology integration, self-directed learning, digital literacy, survey

1. Introduction

1.1. Technology-based autonomy

The implementation of technology in teaching and learning in the 21st century is crucial. 21st century teachers are challenged to implement digital tools in the learning process [31]. Additionally, the integration of technology in language classes can potentially improve students' language proficiency, as today's learners are unlike previous learners being digital natives [1]. Similarly, Loganathan and Hashim [21] explains that technology implementation in language classrooms can meet students' needs and increase their motivation to learn the language. More importantly, Suherdi [31] explains that technology use in the 21st century is an undistinguishable part of our schools and workplaces. As a result, it has become a basic skill.

✉ mimoun_melliti@yahoo.com (M. Melliti); mansourh66299@gmail.com (M. Henchiri)

🌐 https://univ-k.rnu.tn/en/teachers/156/henchiri-mansour (M. Henchiri)

🆔 0000-0002-2791-4051 (M. Melliti); 0009-0000-8037-3402 (M. Henchiri)

However, Gordon [14] argues that despite the series of technological innovations and their promise to revolutionise learning, higher educational institutions are remarkably unchanged. The standard pedagogical approaches remain the same, where students' learning experience is based mainly on the lecture, essay, and exam pedagogical tools with no apparent change in the fundamental structure of the university. On the other hand, Hafner and Miller [15] emphasises the urge to properly implement technology in formal settings as it increases students' engagement and empowers learners with the required tools to achieve learning goals, subsequently boosting autonomy. Felix [12] argues that all stakeholders regard technological tools as revolutionary and effective tools when implemented in the literary curriculum. It bridges the gap between high achievers and low achievers as it provides students who have learning difficulties with the proper support system. Also, Pellerin [25] argues that learners are more likely to be autonomous when carrying out certain aspects of their learning using technological devices as they are digital natives, and it reinforces their digital identities.

Technology developments have had a significant impact on higher education, leading to a greater focus on artificial intelligence in this field [2]. Artificial intelligence is a flexible tool that can be used in many different academic fields, including mathematics, engineering, medical education, and language teaching [20]. Gardner and Miller [13] point out that making the transition from a curriculum-focused model to one that puts learner autonomy first is a complex process that calls for intentional actions from educators as well as other stakeholders in education. The use of technology in the classroom presents a wealth of pedagogical opportunities in higher education, and the results of technology-driven initiatives can encourage students to take a more active role in their education.

However, technology might bring its own disadvantages, resulting in impeding the learning process due to its limited features in certain environments; for instance, when batteries' health degrades, it inevitably impacts the duration a learner can interact with his smartphone or laptop [29]. In the same regard, Reinders [28] described an online program intended to boost autonomy as a partial failure due to students' lack of engagement and interest in self-directed learning in the formal classroom environment.

So far, the concept of autonomy has been defined and deconstructed, and its conditions have been explained to link the continuous attempts to foster autonomy with widespread digitalisation. The implementation of autonomy with the aid of technological tools consequently gave birth to Self-Access Centers (henceforth SAC). Finally, the challenges faced by educators in creating and executing a technological framework that supports autonomous learning often hinder the attainment of desired educational outcomes. This issue serves as the foundational problem statement for this survey.

1.2. Implementations and outcomes in Tunisia

According to Hamdy's report [16], officials' endeavour to enhance the Tunisian infrastructure can be seen in the increase in the number of computers as it jumped from 22.000 in 2004 or an average of 0.28 computers for every class to 57.000 in 2006 or an average of 0.71 computer for every class. In addition, around 20% of the courses were taught online. In terms of infrastructure, both students and teachers confirm that the shortage of required equipment is the main reason behind the poor integration of technology (78.69% and 72.73%, respectively). Around 60% of

learners did not express satisfaction with the quality and efficiency of the training. Thus, the shortage of equipment, digital literacy, and training amongst learners, as well as the cost, are the main challenges to the effective integration of technology in Tunisia.

Karamti [17] conducted a study on the impact of the digital tools implemented on the academic performance of students in the City of Sfax because it represents the second largest number of higher educational institutions (10%) and students (12.23%) in Tunisia. The students and teachers belonged to different branches: social sciences, natural sciences, computer sciences and humanities. Two hundred fifty students were surveyed using two separate questionnaires with a response rate of around (75%). These questionnaires covered a few themes, including motivation, experience with digital tools such as computers, teachers' and students' attitudes, pedagogical training, and infrastructure and access. The findings show that students' usage of available digital gadgets mainly revolves around leisure activities, including Facebook 72.1%, watching or downloading movies 64.7%, 72.7% music and 57.2% games. More importantly, learners' education usage did not exceed 65.7% for extra curriculum assignments and as low as 29.1% for documentation while researching. Surprisingly, 50.3% of participants reported rarely or never interacting with digital tools at the university, while 65% considered these tools as a form of distraction. Another 41% expressed that these tools are not an effective tool in learning.

Cheikh [5] posits that Tunisian stakeholders should implement incremental measures to cultivate learners' autonomy through systematic training while promoting collaboration between teachers and learners to implement technology in higher education effectively. Nevertheless, it appears that this objective is mainly theoretical, as its practical implementation is hindered by various genuine factors [5]. This study aims to assess the present state of technology-based autonomy in Tunisia, focusing on educational policy as well as the attitudes and practices involved.

2. Methodology

Nowadays, digital tools are pervasive, with the wealth of knowledge about the humanities present at the click of a button [8], which means that the method in which present-day educators are taught has changed substantially. A new generation of students requires a vastly different approach. To understand and design a curriculum that implements technology most effectively and promotes autonomous learning, this study investigates the current integration of technology to enhance autonomy at the University of Kairouan, students' perceptions concerning technology usage in and outside the classroom and the present-day accommodations for the identified students. It responds to three fundamental questions which are:

1. Do students engage in and value technology-based learner autonomy at the university level?
2. What are the underlying challenges of technology-based learner autonomy?
3. What is the perception of teachers at the University of Kairouan regarding the use of educational digital tools to enhance learner autonomy?

A total of 102 English students at the University of Kairouan participated in the questionnaire. Figure 1 shows that 55% of participants are first- and second-year MA students while the rest

of them are at the licence level. A license degree is equivalent to a bachelor's degree, so these students are first, second and third-year students of English. The youngest participant is 19 years old, and the oldest is 50 years old. The average age is 25. Additionally, 25 teachers were interviewed in this study.
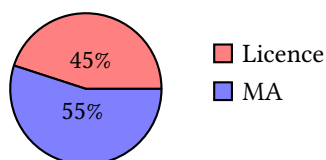

Figure 1: Questionnaire participants.

The list of research approaches covers three types: the qualitative, the quantitative and the mixed method approach. The first two must not be viewed as rigid, contradictory and distinct categories. Instead, they represent different aims of one continuum. Additionally, the mixed-method research approach represents the middle of this continuum and offers the best of both worlds [6]. There are three types of mixed methods, the first of which is the convergent mixed method, in which the researcher merges the results of both the qualitative and quantitative data to provide a thorough analysis of the research problem; in the design, the data is typically extracted simultaneously via both approaches. The second one is called the explanatory sequential, where the quantitative data is acquired initially, and it serves as the Launchpad for a more comprehensive explanation through the qualitative method. The last one is called the explanatory sequential mixed method, whereby the researcher reverses the explanatory method and starts with qualitative research to explore the perceptions of the participants. Then, that initial phase presents the basis of more accurate quantitative research that seeks to investigate the most relevant of issues at hand [7].

This study was carried out through a convergent mixed-method approach. Mixed methods research is an approach that makes use of both quantitative and qualitative methods, strategies, and skills in one study. The characteristics of mixed methods research cover complex research problems, research questions that emphasise methodological decisions, the combination of quantitative and qualitative approaches in the research process, and the research results gathered from quantitative and qualitative data analysis [26]. The mixed method approach not only mixes but also integrates both quantitative and qualitative data. The analysis of the qualitative and quantitative data is not sufficient, so further analysis is required, which consists of integrating the two databases for a better understanding of the research problems and questions. This approach gained popularity dramatically in the last years [7]. Additionally, Microsoft Excel is used to analyse the quantitative data and represent it in charts or tables. The questionnaire responds to the first and second research questions, while the interview deals with the third research question.

The selected triangulation approach, which involves the collection, analysis, and integration of both quantitative and qualitative data within a single study, aims to provide a comprehensive understanding of the concept being examined and enhance the accuracy and validity of the research findings. The scale of measurement used to measure autonomy is an earlier version of the most recent scale known as "the Chinese Collaborative Engagement Scale". It was developed

by Xu, Stephens and Lee [32] to assess student involvement in collaborative learning with technology. This scale was adapted from previous scales used in 2022 and before, such as the Collaborative Online International Learning (COIL). The aforementioned scales measure the same dimensions of learner autonomy.

The assessment tool measures three facets of engagement: behavioural, cognitive, and emotional. Every aspect was assessed using modified items that were taken from well-known engagement scales, guaranteeing their applicability to cooperative learning environments. For instance, cognitive engagement (CE) evaluated the mental effort and metacognitive techniques used during group activities, whereas behavioural engagement (BE) examined the extent to which students interacted with their classmates. Emotional engagement (EE) focuses on the emotions felt during group projects, such as happiness or boredom. These three components correspond with the tripartite model of student involvement identified in Western educational settings [32]. The questionnaire was adapted from these scales.

Students' questionnaires were sent online to 102 English students at the University of Kairouan. These students belong to different levels: MA level and license level. Mostly, the researcher had to be present while they answered the questions to explain key concepts, encourage students to ask for clarification, maximise their credibility by making sure they do not copy the same responses from each other and guarantee a higher response rate. Students were told it would not take more than 10 minutes. Leaners were not compelled to write their names so they could freely express their feelings and attitudes. The confidentiality of data and the anonymity of all the participants were assured. Additionally, 25 semi-structured interviews were conducted with teachers. They were given the choice to respond to it in class or at home to offer more flexibility and attain higher response rates. Teachers were also approached during recess times at their offices after sessions were over and at the cafeteria.

3. Results

Results are going to be divided according to the number of problems.

3.1. Motivational challenges

The themes that were covered to provide an elaborate and gradual response to this section are as follows: academic experience evaluation (figure 2), presence and participation (figure 3), understanding of learning goals (figure 4), out of class learning (figure 5).

Students displayed varied degrees of satisfaction in terms of their evaluation of the academic experience they had so far in their university programs; 36% were satisfied, and to a lesser degree, 4% of them were very satisfied. Third of the students remained neutral, whereas the rest were dissatisfied (19%) and very dissatisfied (8%). As explained in section 2, students' perceptions and attitudes of their own learning practices inside the classroom play a central role in boosting engagement [30] and giving the fact that most of the students seemingly have a positive impression of their academic experience, we can extrapolate that this is another indication of a successful learning process.

Around a quarter of students remained neutral, while 62% of them considered themselves regularly present and actively engaged in the classroom. Surprisingly, only a minority of
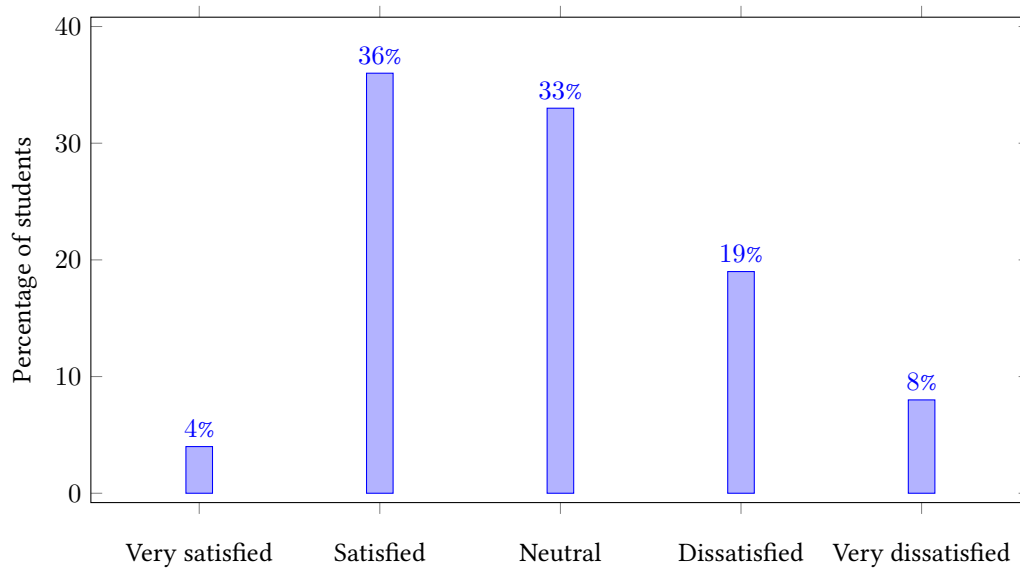
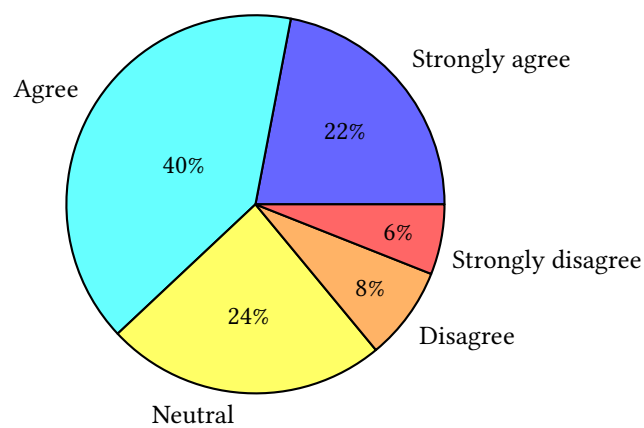**Figure 2:** Academic experience evaluation.

Figure 3: Presence and participation.

students (14%) displayed absence, whereas most students reported active participation in the classroom. Interpreting these statistics might be reflective of healthy levels of motivation for attendance and participation. Thus, most students appear to be interested and engaged, and they seemingly serve an active role inside regular classrooms, which might be seen as one successful step towards autonomy for the majority.

Figure 4 displays the fact that 64% of learners have a fair to good understanding of the learning goals set by the teacher. Only 18% seemed to face difficulty recognising their learning goals, while another 18% remained neutral. Students do not seem to face difficulty in understanding the learning outcomes that they are expected to meet, which further boosts engagement and might
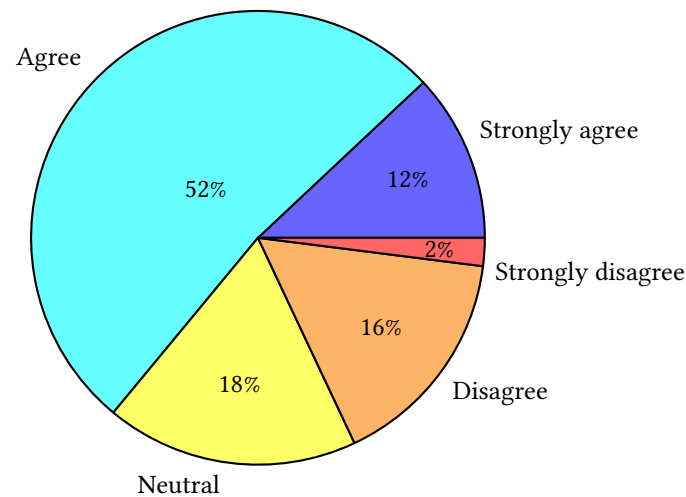
Figure 4: Understanding learning goals.

provide an indication of a flexible learning environment inside the classroom and the clarity of learning goals from students' perspectives. However, students' reflection on their learning inside the classroom is not enough to guarantee autonomy and engagement, which occurs in combination with the personal aspect of their learning rather than the externally induced one [24]. Consequently, it is paramount to verify if there is a continuation of engagement from the regular class to the out-of-class context.
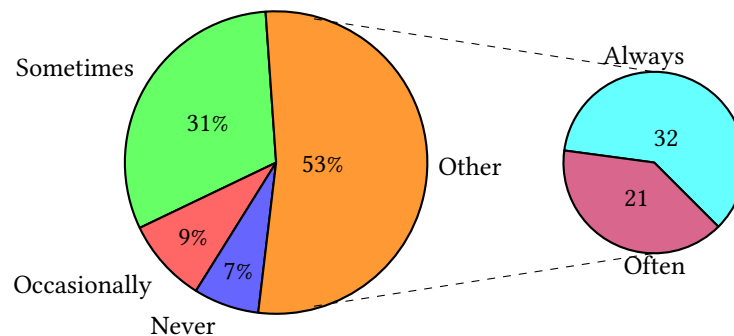

Figure 5: Out of class learning.

The survey of learners' out-of-class studying shows that 53% of them do carry out certain aspects of their learning very often, while another small minority almost never does that (7%). Another 31% show some instances of outside-the-classroom learning. The majority of participants indicated a strong tendency to maintain the continuity of the learning process from within the classroom to outside of it. In comparison, over 60% of students are present, engage actively and understand their learning goals. In contrast, 80% engage in individualised efforts to learn, which can be a further confirmation that students are highly driven and possess positive

attitudes towards learning. The data collected from this item is not only equally promising as previous items as far as the motivation and autonomy are concerned, but also, it visibly portrays learners as generally consistent and highly motivated in both formal learning contexts when supervised by teachers and on their independent efforts outside the class.

3.2. Technology utilization gaps

This challenge will be discussed in four parts, including technology use in class, technology use outside of class, online course availability, and traditional courses vs. digital tools.

3.2.1. Students' use of technology

This section is studied through four different lenses: technology use in class, technology use outside of class, the availability of courses online, and traditional sources of knowledge under the influence of computers.
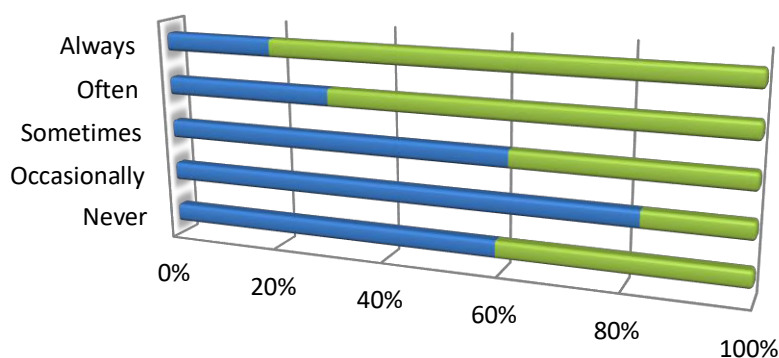

Figure 6: Technology use inside vs. outside classroom

According to the data, 59% of students report a high usage frequency of technology outside the classroom in order to carry out certain aspects of their learning. 32% of respondents displayed a lower frequency, while the last 9% clearly never used technological gadgets for educational purposes outside the classroom. Only 20% of students reported frequent use of technology in formal learning contexts, while 67% reflected low usage frequency. Another 13% showed that there are absolutely no instances of digital tools implementation in regular classes. The low percentage of technology use inside the classroom is a major area of weakness that ought to be addressed.

Figure 6 compared the use of technology inside and outside the classroom. It shows that there is a significant decrease in class integration of technology for educational purposes compared to its counterpart. For instance, 59% of learners regularly rely on digital tools outside class; however, inside the classroom, only 20% reported a good usage frequency, whereas the majority reflected a lack of regular implementation inside the class. Thus, a significant gap has been detected in technology implementation in formal learning contexts in comparison to what students need and are familiar with in an out-of-class context. Consequently, more implementation in formal learning contexts is paramount to keep up with students' needs and learning habits.

Table 1
Online courses and its impact on traditional sources of information.

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Course materials availability online	10%	41%	18%	20%	11%
Computers neglect traditional sources	20%	30%	12%	30%	8%

As shown in table 1, nearly half of the respondents (51%) confirm the availability of the courses dealt with in class online. At the same time, 31% argue otherwise, which unveils another gap in terms of online availability of courses. Therefore, teachers' collective efforts to ensure and maintain the online availability of these courses ought to be acknowledged and prioritised in future attempts to promote change and development by different stakeholders.

Surprisingly, whether computers neglect traditional sources of knowledge or not remains a divisive issue amongst students, as half of the students view computers as dismissive of older sources of knowledge: hard copies of books, booklets, dictionaries... in the sense that they are rendered redundant when the access to newer and more advanced sources of knowledge is provided, e.g. computers. On the other hand, the rest are either neutral or disagree with that notion because they potentially see the role of computers and traditional forms of knowledge as complementary and not necessarily based on codependency, where one form represents the main access gate to information at the expense of other sources.

3.3. Perceptions of smart classrooms

This part includes the impact on learning styles, the link to increased motivation, online efficacy during lockdown, attendance rates, challenges with digital literacy, and rigid teaching methods.

3.3.1. Impact on learning styles

As explained earlier, students' perceptions directly impact their performance and engagement levels [30]. Therefore, in order to investigate the theme of students' engagement in technology-based learner autonomy, students' perceptions of smart classrooms ought to be studied. This notion is studied from various angles: the impact of technology-based learner autonomy on students' learning styles, motivation, efficacy, availability of access tools, and presence rates.

Based on the quantitative data from the questionnaire, 24% of respondents strongly approve of the fact that technology-based learner autonomy does accommodate students' different learning styles. Similarly, another 52% of learners are found to be in favour of that argument. While 11% of students remained neutral, the rest of the students were against that argument, believing that technology-based learner autonomy on its own fails to accommodate students' different learning styles. Clearly, most respondents (76%) acknowledged the importance of the role of technology-based learner autonomy in providing a flexible environment that accommodates and adapts to the variety of students' learning styles.

Figure 7 shows that 31% of learners strongly believe that smart classrooms increase motivation levels, while 36% consider the impact of smart classrooms on motivation levels as positive. 18%
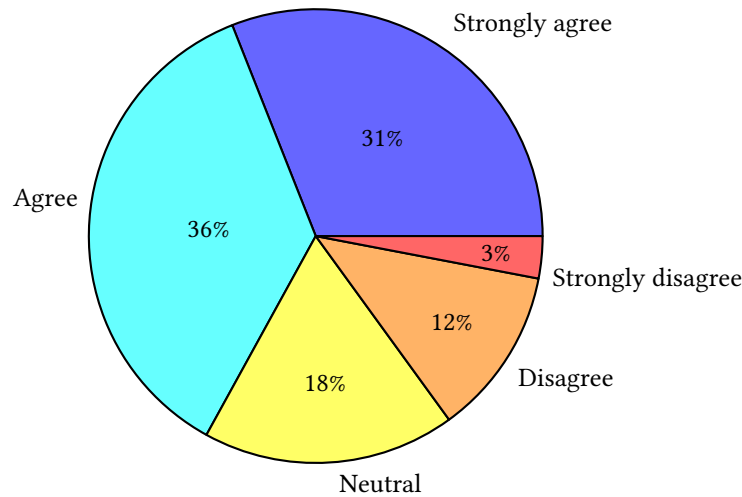
Figure 7: Impact of smart classrooms on student motivation.

of respondents remained neutral while the other 15% did not seem to acknowledge the existence of a potential link between smart classrooms and increased motivation levels. Most of the participants (67%) acknowledged a direct link between smart classrooms and increased motivation levels, which further stresses the vitality of technology integration in higher education for autonomous learning.
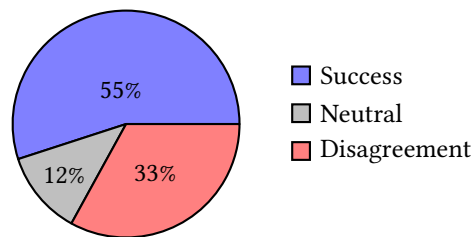

Figure 8: Efficacy of online learning during lockdown.

As shown in figure 8, the efficacy of online learning seems to be another divisive issue among the participants, as 55% of them considered it to be a success during the coronavirus lockdown, whereas the rest of the responses did not share the same point of view as it ranged from neutral (12%) to disagreement (33%). Therefore, there seems to be a disinterest in online learning. Given the fact that students were found to be highly motivated, we can extrapolate that the issue might not stem from the innate state of students, but rather, it seems to be tied to external factors. Therefore, the next logical point would be checking if learners possess the required access tools for online learning.

According to the data, the majority of respondents (66%) reported that they have the required technological gadgets to access online learning. While a fifth of them remained neutral, another 14% of students showed that they lack the very basic tools necessary for online learning to

take place. Generally, most students had access to technological devices. However, a small yet essential portion of students find themselves marginalised when it comes to online learning. Consequently, unless this lack of access to basic tools is addressed and coped with, it will undermine students' engagement in technology-based learner autonomy. The unavailability of access tools is one potential reason behind the dissatisfaction of some students with online learning, so how does it impact their presence in online sessions?
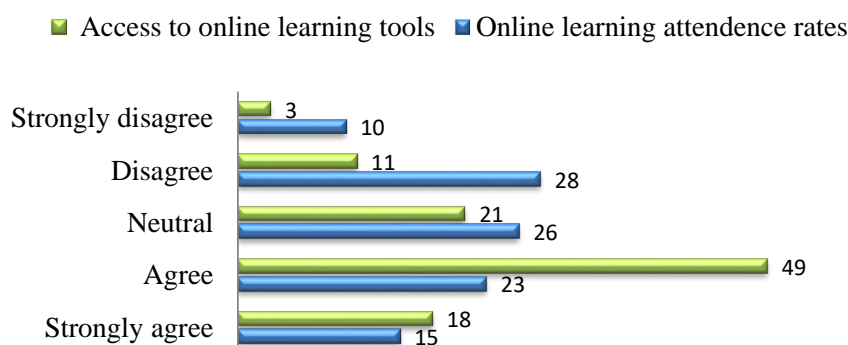

Figure 9: Impact on online attendance rates.

The direct correlation between having access to online learning gadgets and higher attendance rates online can be observed in figure 9. Unsurprisingly, 15% of students strongly agree that online learning increases attendance rates. Similarly, another 23% of respondents share a similar view to a lesser degree. A quarter of the participants remained neutral, while the rest (37%) disagreed with that statement. Based on the data displayed, having no access to digital tools required for online learning, the chart correlated with lower attendance rates. Thus, the lack of access is deemed to be one possible contributor factor to not necessarily the disinterest in attending online sessions but rather the inability to do that in some cases.

In conclusion, students are generally satisfied with their academic experience (44% compared to 23%), and most of them attend regularly and engage consistently (62% versus 14%) in formal learning contexts. Additionally, the majority (64%) showed a clear understanding of their learning goals, which is reflected in the high percentage (84%) of the out-of-class independent studying done by students. 76% of learners acknowledged the value of technology-based-learner autonomy in accommodating students' personal learning styles. 67% of respondents valued the smart classroom's role in boosting motivation levels. Generally, the students at the University of Kairouan reflected healthy levels of motivation, active participation, and awareness of their learning goals by valuing technology's role in increasing motivation and accommodating students' learning styles.

However, only half of the respondents reported the availability of course materials online. When comparing the frequency of technology use inside the classroom (20%) to what students are typically familiar with on a regular basis (59%), a clear gap is identified in terms of meeting students' technological needs in class. This gap is also evident in students' divisive opinions on the success of online learning during the pandemic, as only 55% of them regarded it as successful while the rest did not share the same opinion, which might be an indication of some

underlying difficulties when it comes to students' engagement in technology-based learner autonomy. Additionally, irrespective of how obvious the link is between limited access to online learning gadgets and lower online attendance rates, it cannot be regarded as inclusive of all students due to the fact that it is only concerned with a small proportion of learners (14%). What might provide a better scope of analysis is the focus on more scalable and generalisable impediments to students' engagement in technology-based learner autonomy, which will be the point of the second question.

3.4. Challenges of technology usage

The themes that were covered to provide a gradual and detailed response to this question are students' resistance to using technology for self-directed learning, digital literacy skills, SAC availability, and applicability of the aspects of autonomy in reality.

3.4.1. Students' resistance to using technology for self-directed learning

This idea is studied through three lenses: maintaining focus on the screen, the sense of isolation during online sessions, and the viability of online sessions compared to regular ones.
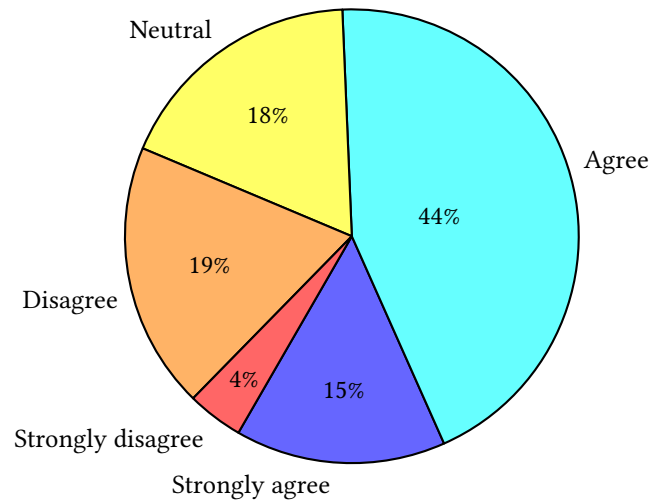

Figure 10: Students' screen focus difficulties.

According to figure 10, 59% of respondents reported difficulty focusing on the screen, while another 18% remained neutral. Around a fifth (22%) of learners did not face difficulties maintaining focus on the screen. Therefore, not being able to maintain focus on the screen seems to be a pervasive issue among learners.

Alarmingly, half of the respondents (49%) reported experiencing a sense of isolation during online sessions without the actual presence of their peers. Third of the students (34%) did not seem to face any sort of difficulty without their peers. The rest (17%) remained neutral, believing that it depends on the context. One possible reason behind the elevated percentages when it comes to the sense of isolation is students' unfamiliarity with online sessions due to the low

percentages of technology use in regular sessions (20%), as explained earlier, which poses the question of how regular sessions compare to online ones.
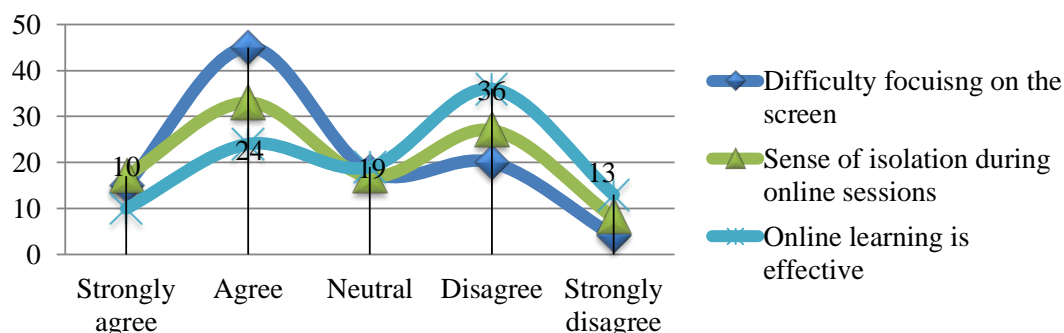

Figure 11: Effectiveness of online sessions compared to regular Sessions.

The data in figure 11 unveils that a third (33%) of the students consider online sessions to be as effective as regular ones if not more. However, the rest of the respondents did not seem to share the same view concerning the efficacy of online sessions, as a fifth of the students (19%) remained neutral, whereas nearly half of them (48%) preferred the formal learning context over online ones, considering the former to be more effective in their regard over the latter.

Figure 11 shows that there is a correlation between a low preference for online learning and the difficulties experienced by students, especially when focusing on the screen. The correlation, in this case, is causational as well. Therefore, the unfamiliarity caused by low usage of technology inside the classroom (20%) led to a chain effect starting from difficulty focusing on the screen (59%), a sense of isolation (49%), and consequently, negative impressions concerning the experience of learning with digital tools.

3.4.2. Digital literacy

This item is examined from various perspectives, including the time requirements of technology-based learning autonomy skills, basic software skills, students' main online access device, and browsing the internet for course-related materials.

Nearly half (49%) of the learners considered developing the skills needed for the autonomous use of technology to be a demanding task in terms of time consumption. Around a fifth (18%) of respondents remained neutral, while a third of them (34%) did not regard the required skill set for technology-based learner autonomy to be time-consuming. Even though some students did not acknowledge the long-term requirements of technology-based learner autonomy, nearly half of them seemed to have a fair understanding of its time-consuming aspect.

Generally, 67% of students believe that they possess basic software skills to create PowerPoint presentations and use Excel in accordance with the task at hand. 13% of them remained neutral, while a fifth of the participants did not possess the capacity to make use of basic software such as Excel and PowerPoint. Generally, the figures display the fact that most of the students meet the basic software requirements to be considered digitally literate.

According to figure 12, the main access tools to online sessions for learners are the personal
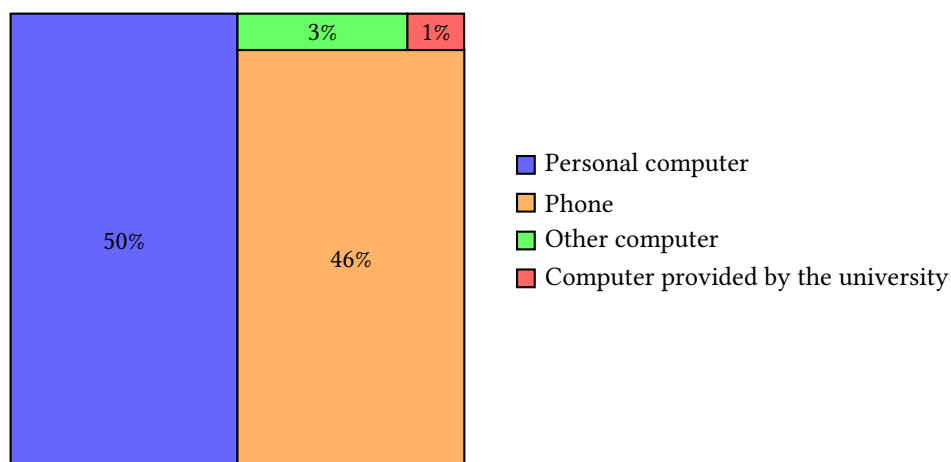
Figure 12: Students' main online access device.

computer (50%) closely followed by their phones (46%), then to a significantly lesser frequency computer obtained from someone else (3%). The rest are computers provided by the university (1%). Phones and personal computers are the two primary access tools by a large margin.

The data shows that 61% of learners can browse the web correctly to find materials relevant to courses and areas of speciality. 16% of students chose to remain neutral, as they believe it depends on the context. 23% of the participants displayed that they could not carry out certain aspects of their learning.

3.4.3. SAC availability

This section is viewed through several perspectives, including the applicability of autonomy outside the Western context, the threat of technology to teachers' roles, and the availability of self-access centres.

The data displayed in figure 13 portrays the diverse opinions of students concerning the applicability of autonomy. 36% of respondents believe that, in reality, autonomy is only viable in the Western context where it initially emerged. Another 9% strongly support that argument, while a fifth of students remained neutral. The rest of them (35%) disagreed with that statement, believing that just because it initially emerged from the West does not necessarily mean it is exclusive to that context.

According to figure 14, the majority of students (64%) do not view technology as a threat to teachers' role in the learning process. 12% of students remained neutral, while almost a quarter of them (24%) regarded that teachers' function is easily replaceable by digitalisation. Generally, most learners seem to believe that teachers can still serve as facilitators of the information that is provided by technological tools, unlike another quarter of them who regard teachers' role in this case as redundant. The data unveils that 54% of respondents think that there is a self-access centre available in their university. 17% remained neutral, while the rest (29%) reported the unavailability of this facility at their university.
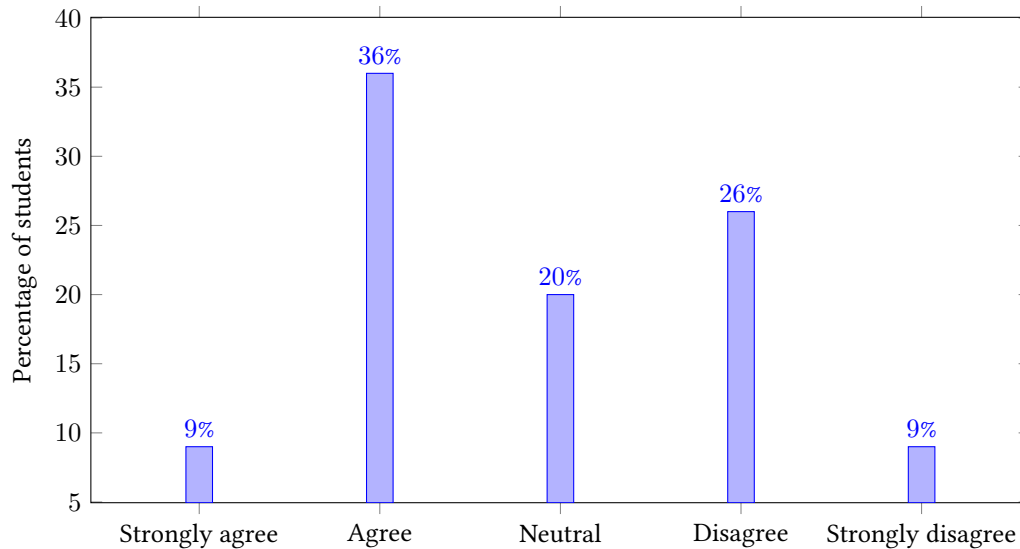
Figure 13: Applicability of autonomy outside the West.
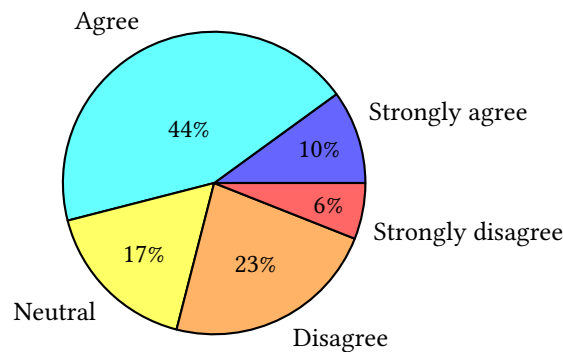
Figure 14: Technology threat to teachers' role.

3.4.4. Aspects of autonomy in reality

This item is studied through two scopes: the applicability of the aspects of autonomy in the university and the potential resolutions.

The data shows that over half of the students (54%) believe that the aspects of autonomy are unrealistic and, therefore, not practical or applicable in the university. While 17% of them remained neutral, the rest (29%) viewed autonomy as applicable in their context.

According to figure 15, a quarter of the learners (26%) consider varying learning methods from just regular to blended learning can potentially alter the negative impressions of online sessions for the better. Another 38% of respondents supported communicating the value of technology-based learner autonomy through conferences, meetings, study days and workshops. While 17% of learners preferred strengthening graduates' online identity as a more effective

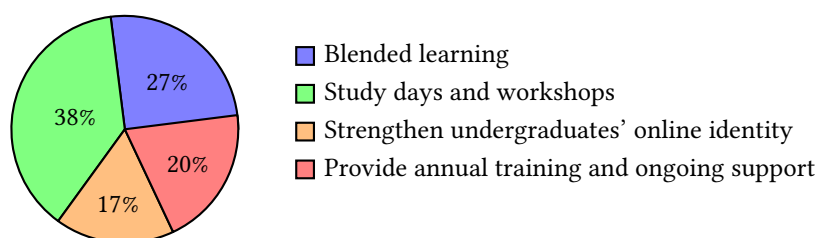**Figure 15:** Students' suggestions for improving perceptions of online learning.

approach, the remaining 20% favoured the annual training and ongoing support to students.

3.5. Perception challenges of technology-based learner autonomy

The semi-structured interviews were recorded on a mobile device with teachers' consent for better analysis at a later stage. Seasoned educators were specifically targeted in this interview due to their credibility, broad perspective, and deep understanding of educational policies. This section attempts to answer the third research question: What is the perception of teachers at the University of Kairouan regarding the use of educational digital tools to enhance learner autonomy in Tunisia?

The themes that were covered to provide a detailed and gradual response to this question are teacher perception of students' autonomy, formal training and digital literacy, and gradual improvement.

3.5.1. Teachers' perception of their students

Table 2 displays a summary of teachers' responses and the questions which are related to this section.

The "no" side argues that students' prolonged exposure to teacher-centred classrooms impacted their ability to learn independently. According to teachers, students went through rigorous conditioning to abide by a "rigid structure" from the early stages. Some teachers cannot operate freely, as often they have to "abide by the curriculum which might not be the most suitable in certain cases". According to him, if the teacher cannot be autonomous, how are the students supposed to develop autonomy? The current educational system, especially at the primary and undergraduate level, suffers from "no interaction" and "dead creativity". One teacher stated, "Autonomy is extinct ... it's the system's tragic mistake" he argued that students are not the ones to blame, as there has never been an actual implementation of a student-centred approach. Another teacher remarked, "They heavily rely on my efforts...otherwise, it's like I am talking in Japanese" his statements epitomise learners' lack of reflective learning and dependence on teachers' efforts. Other teachers did not consider the system to be a major contributor to their lack of self-directed learning; as one of them puts it, "Autonomous learners are intrinsically motivated". She stressed the fact that students at the university level are seen as advanced learners who assume full responsibility for their learning practices.

On the other hand, the "yes" camp responded with a conditional "yes" as they believe that

Table 2
Students' autonomy.

Question	Response
Are your students autonomous?	Yes: Some are motivated and engaged, autonomous to some extent, MA students are more autonomous
Are your students autonomous?	No: Undergraduates depend heavily on teachers, autonomy is rare, shortcuts like copying and Wikipedia are common
Are your students autonomous?	It depends: Task and student's level
How do you support their autonomy?	Yes: Task-based approach, rewards/bonuses, focus on low achievers, guide with course materials, encourage interaction, group activities
How do you support their autonomy?	No: Autonomy is intrinsic, needs early training, external motivation insufficient, formal training is time-consuming
Do they handle online information correctly?	Yes: They are improving in managing online information
Do they handle online information correctly?	No: Cheating and copying are common, unfamiliar with proper information handling
Do they handle online information correctly?	It depends: Task and student's level

there are observable instances of autonomy but it's limited to some students and "it depends on the task or level", as one teacher puts it "this depends on the task assigned…sometimes they are autonomous but other times they are dependent on me" for example some members of "FAWKES" club who are not only excelling in their areas of speciality but also actively engaging and consistently participating in organising events, facilitating meetings and study days. Additionally, one teacher argued that autonomy "needs progress and gradual improvement", so the limited number of motivated students "at the beginning" can potentially increase over time with consistent efforts to keep learners engaged.

Teachers' ways of dealing with students' lack of autonomy varied as some teachers adopted a "task-based approach" while others stated, "I do not give full lectures…only guidelines". Another teacher remarked, "Attention should be paid to learners with low motivation"; he argues that he devotes time and effort to raising students' awareness. Another teacher proposed "allowing the room for interaction between teachers and students rather than direct commands" he insisted on developing the lesson constructively, relying on interaction rather than direct instructions and commands. On the other hand, one teacher cited, "It's late at this stage to discuss developing autonomy as it needs training from basic levels". Similarly, another teacher said, "External motivation is not sufficient … they need formal training".

On the one hand, educators view that some students possess the capacity to carry out certain aspects of their learning appropriately online while selecting relevant sources from trusted websites. Another teacher stated that "they are improving". However, for first-year and second-

year students, "copying is the norm". One teacher remarked that they "depend on it to cheat", a clear sign of internet misuse. Some other teachers provided a conditional answer: "It depends on the level and task assigned". In this case, first-year students are the ones struggling the most in terms of browsing strategies.

3.6. Formal training and digital literacy

Table 3 provides a summary of teachers' responses and questions concerning training in digital literacy.

It is evident from the table 3 that all teachers, without an exception, value and support digital literacy in higher education, referring to it as a basic necessity vital for researchers and the future. One of the teachers remarked, "Without mastery of digital literacy, learners will get nowhere". Thus, learners cannot do assignments, research and progress without acquiring the cognitive set of skills required to operate digital tools. Another teacher stated, "A student who cannot manipulate technology has no present and no future too".

Additionally, most teachers and students had no formal training program to develop autonomy. Yet, some teachers had training, as one of them stated, "I had training in the United Arab Emirates on how to manage a resource centre". Others regularly attend "practical workshops" and conferences on autonomy or digital literacy. For undergraduate students, teachers argued that they have a subject dedicated to helping them learn the basic requirements of digital literacy, "basic software skills."

Moreover, most teachers believed that online learning was a successful alternative during the outbreak of the coronavirus. One teacher remarked, "Online learning was a good solution". Another added, "They saved the whole academic year, and it was an opportunity to think of them seriously"; he stressed the fact that they were not only a successful countermeasure but also an essential experimental phase. Other teachers argued that "it was flawed", but generally, it can be improved, given the fact that it is a relatively new approach. Thus, this led some teachers to believe that actual autonomy is only applicable in the West as "they are leading technologically", while the majority of teachers argued that "with gradual improvement and proper management", it certainly is applicable to the Tunisian context.

Also, only two (25%) of teachers were familiar with self-access centres, indicating the little to no availability of these facilities in their corresponding contexts. According to educators, the resistance to technology implementation can be principally explained by digital illiteracy, outdated teaching methods, rigid structures, the fear that it "may replace teachers", unstable networks, student misuse and "teachers avoiding additional responsibilities".

3.7. Gradual improvement

As explained above, the main cognitive challenges are the limiting pedagogical plans and digital illiteracy, while the financial challenges are concerned with the poor infrastructure. Teachers insisted that "identifying their cause is a step forward to curb them or even put an end to them". Another teacher remarked "adapt, improvise, survive and even flourish". Generally speaking, there seems to be a consensus amongst teachers on the vitality of allocating financial resources,

Table 3
Formal training and digital literacy.

Question	Yes	No	It depends on
Is digital literacy important in higher education?	• Necessity • Basic requirement • The new norm • It is the future • Vital for researchers		• Task • Complexity
Do teachers/students receive formal digital literacy training?	• Multiple training programs available • Computer science courses provided • Active workshops participation	• Many students receive no formal training	
Were technological gadgets effective during the pandemic?	• Appropriate alternative • Zoom is successful in maintaining contact • Blended learning effective • Saved the academic year	• Only occasionally effective • Had flaws	
Is technology-based learner autonomy only applicable in the West?	• West is leading technologically	• Applicable with right policies • Depends on infrastructure • Can be adapted to different contexts	
Are people familiar with self-access centres (SAC)?	• Some trained on usage	• Many not familiar	
Are self-access centres effective?	• Helpful for some students	• Some students lack capacity to use them	• Management • Student abilities
Challenges of SAC	**Cognitive:** • Rigid strategies • Limited teaching methods • Lack of training **Financial:** • Equipment costs • Network requirements • Limited budget **Other:** • Policy issues		

enhancing digital literacy and adopting more flexible technology-based approaches such as the establishment and proper management of SAC.

4. Discussion

4.1. Addressing motivational barriers

This study set out to explore whether students at the University of Kairouan are genuinely engaging in technology-based learner autonomy. A critical finding is that student motivation serves as a pivotal factor influencing their capacity for self-directed learning. The data revealed that, while 44% of students reported satisfaction with their academic experiences and 62% confirmed active participation in classroom settings, a significant percentage – 27% – expressed dissatisfaction. This discrepancy indicates that while a portion of students feel motivated, many remain passive participants in their education, highlighting the motivational barriers that inhibit autonomy. Teachers observed that undergraduate students exhibit a high degree of dependency on guidance, contrasting with the more autonomous behaviours seen in MA students. This trend suggests a systemic issue rooted in traditional educational practices, which remain predominantly teacher-centred and rigid. Teachers described their pedagogical methods as resembling those used in primary schools, thus further stifling students' potential to develop autonomy. To truly address these motivational barriers, it is essential to reframe instructional practices to foster greater flexibility. By allowing students to make more choices regarding their learning paths, educators can create an environment that nurtures autonomy by empowering students to become more engaged in their education, especially at lower educational levels. The disparity between MA and undergraduate students indicates that targeted interventions in teaching practices at earlier levels could cultivate a culture of autonomy that thrives in higher academic stages.

4.2. Bridging technology gaps

Another critical issue identified in the study was the considerable gap between students' use of technology inside and outside the classroom. The findings revealed that 59% of students regularly use digital tools outside the classroom for learning purposes, whereas only 20% of students utilise technology frequently during class sessions. This discrepancy indicates a significant disconnect between the students' informal learning preferences and the more traditional structures of classroom instruction. Moreover, while 51% of students reported having access to online courses, a significant portion—31%—stated that they did not, highlighting issues with digital resource availability. The reliance on traditional pedagogical tools such as lectures, essays, and exams, despite the prevalence of technological innovations, has contributed to the underutilisation of technology within the classroom. This gap between technology's potential and its practical application in formal education suggests that current teaching methods have not yet adapted to the digital landscape. Addressing this gap will require integrating technology more consistently into classroom settings to ensure students' in-class experiences align with their out-of-class habits. Such an integration would not only make learning more engaging for

students but also create a more seamless learning experience that incorporates technology as an essential element of the educational process.

4.3. Enhancing smart classroom effectiveness

The students' perceptions of smart classrooms reveal an optimistic viewpoint; 76% recognised that technology plays a crucial role in accommodating various learning styles, and 67% linked smart classrooms to heightened motivation. These insights illustrate that students are aware of the potential benefits that technology can bring to their educational experiences. However, it is equally important to acknowledge the challenges that accompany these positive perceptions. Limited digital literacy remains a significant hurdle, preventing both students and educators from fully leveraging smart classroom technologies. Educators voiced concerns that conventional teaching methods restrict student autonomy, particularly in the formative years of their education. These observations suggest that merely integrating technology into classrooms is insufficient; adequate training and support are paramount to ensure that both students and educators can utilise these tools proficiently. Additionally, it is essential to foster clear communication of learning objectives to empower students to use technology effectively. Addressing these challenges is not just about improving the effectiveness of smart classrooms; it is about cultivating an educational environment that genuinely promotes autonomy and active engagement among learners.

4.4. Overcoming infrastructure challenges

The findings of this study shed light on significant infrastructure challenges that impede technology-based learner autonomy at the University of Kairouan. A notable 78.69% of students and 72.73% of teachers identified equipment shortages as one of the main barriers to effective technology integration. In addition to equipment shortages, financial constraints were identified as a significant challenge, with many students and institutions lacking the resources to invest in modern digital tools. Furthermore, 60% of students expressed dissatisfaction with the quality of training provided for using digital tools, which exacerbates the existing challenges. The findings suggest that improving technological infrastructure is essential for advancing learner autonomy and fostering an environment conducive to student engagement with technology. To effectively address these challenges, institutions must prioritise investments in technology infrastructure, ensuring that reliable internet access, up-to-date digital equipment, and comprehensive training programs are readily available for both students and educators. By tackling these infrastructure limitations, educational institutions can create an environment that actively supports self-directed learning, allowing students to engage meaningfully with digital tools in both classroom and out-of-class contexts.

4.5. Fostering digital literacy

The study emphasises that digital literacy is a cornerstone of promoting learner autonomy in contemporary education. Although students and educators recognise the transformative potential of technology, their ability to integrate digital tools into learning processes is hampered by a lack of digital literacy. The evidence indicates that inadequate training and support significantly

curtail their capacity to harness the full benefits of technology, resulting in diminished learning outcomes. To combat this, there is an urgent need for comprehensive training programs that enhance digital skills among both students and educators. These programs should focus on teaching the practical applications of digital tools in educational settings, helping both students and educators to become more proficient in using technology to support self-directed learning. By fostering digital literacy, students will be better equipped to take ownership of their learning and make informed decisions about how to use technology to achieve their academic goals. Similarly, educators will gain confidence in using digital tools, transforming their teaching practices to create a more interactive and engaging learning environment that fosters autonomy.

4.6. Encouraging intercultural collaboration

An exciting avenue for enhancing learner autonomy identified in this study is the potential for intercultural collaboration through Collaborative Online International Learning (COIL) programs. These initiatives allow students to engage in collaborative learning experiences with peers from diverse cultural backgrounds, fostering critical thinking skills and promoting greater autonomy. The exposure to different perspectives and problem-solving approaches encourages students to take more responsibility for their learning, further cultivating an environment that prioritises student agency. Integrating COIL programs into the curriculum would provide students with opportunities to develop both their digital literacy and the skills necessary for independent learning, ultimately reinforcing their autonomy in various educational contexts.

4.7. Revising assessment methods

The findings from this study underline the necessity of revising assessment methods to adequately reflect students' capacity for autonomous learning, particularly in the context of technology. Traditional assessment techniques, such as standardised exams and essays, often fail to capture the multifaceted ways students can demonstrate their learning and autonomy. In light of this, educators should consider implementing varied assessment strategies that take into account the use of digital tools and different learning styles. Such strategies might include project-based assessments, peer evaluations, and digital portfolios that enable students to showcase their learning in more innovative and self-directed manners. By adapting assessment methods, educators can create a more inclusive and flexible learning environment that values autonomy and prepares students for independent learning, both academically and professionally. The integration of digital tools into assessments would not only align with contemporary educational practices but also provide students with opportunities to engage in meaningful and autonomous learning experiences.

4.8. Professional development for educators

Lastly, the study highlights the critical importance of professional development for educators as a fundamental element in fostering technology-based learner autonomy. Teachers must be equipped with the necessary skills and knowledge to integrate technology effectively into their teaching practices. The findings indicate that a lack of professional development has significantly hindered the widespread adoption of technology in classrooms, limiting educators' ability to

foster student autonomy. Continuous training initiatives are essential to help teachers develop active learning strategies that effectively incorporate digital tools. Such initiatives should focus on empowering educators with the skills to create learning environments that encourage students to take more control over their learning processes. By investing in professional development, institutions can ensure that teachers are prepared to meet the evolving demands of the digital learning environment and actively support the development of learner autonomy. This approach will not only improve the quality of teaching but also enrich the overall learning experience for students, preparing them for the challenges posed by the digital age.

4.9. Comparison with MENA context

Interestingly, studying learner autonomy in the Middle East and North Africa (MENA) reveals a complex landscape characterised by both benefits and drawbacks, with notable similarities and differences compared to the findings of this study. The concept of autonomy may often clash with local cultural norms, as noted by some educators. However, evidence from Libya indicates that promoting such independence is possible [10]. Various studies have investigated learner autonomy within the MENA region, providing critical insights into its perception and implementation. For instance, Borg and Alshumaimeri [4] surveyed 359 teachers in an English Preparatory Year Program in Saudi Arabia, finding that while educators associated learner autonomy with independence and minimal teacher intervention, they expressed concerns regarding its feasibility, citing curriculum constraints and learner-related issues, such as motivation. In Morocco, Lamkhanter [19] identified robust awareness of learner autonomy among 326 university students, indicating positive attitudes and behaviours that could cultivate a culture of autonomy, although questions persist about effective approaches to its development. Similarly, Fedj and Bouhass Benaissi [11] emphasised the need for clarity in defining learner autonomy in Algeria, pointing out its multi-dimensional nature.

Moreover, Qutub et al. [27] assessed the MENA EFL learning environment's readiness, noting educators' openness to integrating new technologies while highlighting outdated curricula. Moradi [23] examined the interplay of autonomy, identity, and agency in EFL education, advocating for a focus on teacher autonomy alongside the challenges that educators face in promoting autonomy among their students. Lastly, Khoudri and Zeriouh [18] reported that during the COVID-19 pandemic, Moroccan EFL undergraduates exhibited limited autonomy, with 69% unaware of their responsibilities as independent learners, although 49% expressed a willingness to participate in decision-making processes. These studies collectively underscore the pressing need for enhanced understanding and practical strategies to promote learner autonomy across diverse educational contexts in the MENA region.

In Tunisia specifically, several challenges arise from institutional limitations, learner-related issues, and teacher concerns. Many Tunisian educators view their students as passive and dependent, perceiving them as lacking autonomy and in need of growth. However, the findings indicate that learner autonomy can be advanced with appropriate support and instruction for both teachers and students [19]. Merely assigning students to groups does not guarantee productive interactions; therefore, it is crucial to establish adaptable learning environments that foster assessment, peer review, and ongoing evaluation, as suggested by El Moudden and Lamkhanter [9].

Qutub et al. [27] investigated how well-equipped the MENA region's EFL education system is to meet the needs of contemporary learners. Their findings illustrate that educators in the MENA region demonstrate a significant willingness to integrate new technologies and innovative teaching strategies to address the demands of students who have grown up in a digital age. However, the curricula and teaching materials were found to be noticeably outdated and in need of substantial revision. This highlights the urgent need for a comprehensive assessment of EFL teaching tools, resources, and methodologies to better prepare students for modern classroom environments and the socioeconomic challenges they will face. Such assessments underscore the importance of conducting further research into the state of EFL in the MENA region, especially within the Tunisian context.

What sets the Tunisian educational landscape apart is the distinct difference between undergraduates and MA students. Undergraduates exhibit higher degrees of codependency and reliance on instructors, demonstrating an overall hesitance to engage in aspects of their learning without teacher supervision. Conversely, MA students display instances of autonomy, often due to their familiarity with out-of-class learning and their capacity for critical thinking and problem-solving in research contexts. However, both groups are hindered by limiting factors such as a lack of professional development programs and inadequately equipped digital facilities [3].

In comparing the Tunisian context with the broader MENA region, several similarities and differences emerge. Both contexts share challenges related to outdated curricula and the perception of students as passive learners who require guidance. However, Tunisia uniquely faces a pronounced disparity between undergraduate and graduate student autonomy, with undergraduates demonstrating a higher dependency on instructors compared to their MA counterparts. While many MENA countries exhibit a willingness to embrace technology, Tunisia's educational system still grapples with integrating digital tools effectively. Ultimately, aligning the perspectives of both teachers and students is crucial to enhancing language learning strategies, incorporating technology, and fostering self-directed learning approaches [18]. Addressing these concerns necessitates a comprehensive understanding of the current state of Communicative Language Assessment (CLA) within the MENA region and beyond, which relies on effectively articulating the views of educators and learners alike. These insights are essential for a thorough analysis of the intricate relationships among the social, cultural, political, psychological, and financial factors that influence the successful implementation of CLA in higher education [22].

5. Recommendations

1. **Curriculum redesign**

   - **Autonomy-encouraging curriculum**: Develop a curriculum that leverages technology to promote self-directed learning. This may involve the incorporation of project-based learning, allowing students the liberty to select their own topics and research methodologies.
   - **Learning flexibility**: Provide students with options regarding their assignments, assessments, and learning approaches to cater to diverse learning preferences.

2. **Enhanced teacher training**

- **Continuous professional development**: Establish ongoing professional development initiatives for educators that emphasise digital literacy, innovative pedagogical techniques, and the proficient use of technology within the classroom.

3. **Mentorship initiatives**

- Create mentorship programs that pair less experienced teachers with seasoned educators who have effectively integrated technology into their instructional practices.

4. **Infrastructure improvement**

- **Technological investments**: Allocate resources towards essential technological infrastructure, including dependable internet connectivity, adequate devices, and smart classroom technologies to support technology-driven learning.
- **Support services**: Ensure the availability of technical assistance for both students and faculty to facilitate the smooth incorporation of technology in educational environments.

5. **Promoting student engagement**

- **Interactive learning spaces**: Design dynamic, technology-enhanced learning environments that encourage collaboration, interaction, and active participation among students.

6. **Feedback systems**

- Implement mechanisms for regular student feedback regarding their learning experiences and challenges related to technology integration, enabling continuous adaptation and enhancement of instructional methods.

7. **Addressing resistance to change**

- **Change management strategy**: Formulate a change management approach that engages all stakeholders (students, educators, administration) in conversations about the advantages and challenges associated with technology integration.

8. **Showcasing success stories**

- Disseminate successful examples of technology integration and self-directed learning from both within and outside the institution to motivate faculty and students alike.

9. **Enhancing digital literacy**

- **Workshops and training sessions**.
- **Professional training programs**.

6. Conclusion

This study highlights the current state of technology-based learner autonomy at the University of Kairouan and the perspectives of both students and educators regarding its implementation in higher education. While a significant portion of students expressed motivation and engagement in self-directed learning, the actual practice of technology integration within the classroom remains limited. The disparity between students' willingness to adopt technology and their

actual usage in formal learning contexts underscores the challenges faced by both learners and educators.

Teachers perceive a notable difference in autonomy levels between graduate and undergraduate students, attributing this gap to rigid, teacher-centred educational practices that dominate the early stages of learning. The findings suggest that fostering learner autonomy is not solely the responsibility of students but requires supportive teaching methods that empower them to take charge of their learning.

Furthermore, both students and teachers recognise the importance of digital literacy and adequate training as prerequisites for effective technology integration. Despite acknowledging the potential benefits of technology in enhancing motivation and accommodating diverse learning styles, significant barriers – such as insufficient resources, inadequate infrastructure, and a lack of formal training – hinder the effective implementation of technology-based learner autonomy.

To bridge these gaps, the study advocates for a comprehensive approach that includes curriculum redesign, ongoing professional development for teachers, improved technological infrastructure, the establishment of supportive learning environments, and more international collaboration. By addressing these challenges, the University of Kairouan can better position itself to cultivate a culture of autonomy, ultimately enhancing the educational experience for all students.

References

[1] Ahmadi, M.R., 2018. The Use of Technology in English Language Learning: A Literature Review. *International Journal of Research in English Education*, 3(2). Available from: https://doi.org/10.29252/ijree.3.2.115.

[2] Alajmi, Q., Al-Sharaf, M.A. and Abuali, A., 2020. Smart Learning Gateways for Omani HEIs Towards Educational Technology: Benefits, Challenges and solutions . *International Journal of Information Technology and Language Studies*, 4(1), pp.12–17. Available from: https://journals.sfu.ca/ijitls/index.php/ijitls/article/view/123.

[3] Ben Youssef, A., Dahmani, M. and Ragni, L., 2022. ICT Use, Digital Skills and Students' Academic Performance: Exploring the Digital Divide. *Information*, 13(3), p.129. Available from: https://doi.org/10.3390/info13030129.

[4] Borg, S. and Alshumaimeri, Y., 2019. Language learner autonomy in a tertiary context: Teachers' beliefs and practices. *Language Teaching Research*, 23(1), pp.9–38. Available from: https://doi.org/10.1177/1362168817725759.

[5] Cheikh, K., 2021. Insights about developing learners' autonomy in Tunisia. Available from: https://www.academia.edu/45061452/.

[6] Creswell, J.W., 2009. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches.* 3rd ed. SAGE Publications, Inc. Available from: https://www.ucg.ac.me/skladiste/blog_609332/objava_105202/fajlovi/Creswell.pdf.

[7] Creswell, J.W. and Creswell, D.J., 2018. *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches.* 5th ed. SAGE Publications, Inc. Available from: https://spada.uns.ac.id/pluginfile.php/510378/mod_resource/content/1/creswell.pdf.

[8] Egbert, J., Huff, L., McNeil, L., Preuss, C. and Sellen, J., 2009. Pedagogy, Process, and Classroom Context: Integrating Teacher Voice and Experience Into Research on Technology-Enhanced Language Learning. *The Modern Language Journal*, 93(s1), pp.754–768. Available from: https://doi.org/10.1111/j.1540-4781.2009.00971.x.

[9] El Moudden, A. and Lamkhanter, F., 2023. Exploring Learning Autonomy: An Investigation into the Perceptions and Practices of ENCG Students in the Acquisition of English Language Skills. *International journal of language and literary studies*, 5(4), p.207–221. Available from: https://doi.org/10.36892/ijlls.v5i4.1484.

[10] Elmahjoub, A. and Lamb, T., 2019. Learner Autonomy: A Cultural Perspective From Libya. In: F.G. Giuseffi, ed. *Self-Directed Learning Strategies in Adult Educational Contexts*. Hershey, PA: IGI Global, chap. 4, pp.71–89. Available from: https://doi.org/10.4018/978-1-5225-8018-8.ch004.

[11] Fedj, S. and Bouhass Benaissi, F., 2018. Key Conceptions on Learner Autonomy and Particular Links with the Algerian Educational Context. *Arab World English Journal*, 9(3), p.445–457. Available from: https://doi.org/10.24093/awej/vol9no3.30.

[12] Felix, C.V., 2020. The Role of the Teacher and AI in Education. In: E. Sengupta, P. Blessinger and M.S. Makhanya, eds. *International Perspectives on the Role of Technology in Humanizing Higher Education*. Leeds: Emerald Publishing Limited, *Innovations in Higher Education Teaching and Learning*, vol. 33, pp.33–48. Available from: https://doi.org/10.1108/S2055-364120200000033003.

[13] Gardner, D. and Miller, L., 2013. The Management Skills of SALL Managers. *Studies in Self-Access Learning Journal*, 4(4), pp.236–252. Available from: https://doi.org/10.37237/040402.

[14] Gordon, N., 2014. *Flexible Pedagogies: technology-enhanced learning*. The Higher Education Academy. Available from: https://www.advance-he.ac.uk/knowledge-hub/flexible-pedagogies-technology-enhanced-learning.

[15] Hafner, C.A. and Miller, L., 2011. Fostering Learner Autonomy in English for Science: A Collaborative Digital Video Project in a Technological Learning Environment. *Language Learning & Technology*, 15(3), pp.68–86. Available from: https://doi.org/10125/44263.

[16] Hamdy, A., 2007. *Survey of ICT and Education in Africa: Tunisia Country Report*. (InfoDev ICT and Education Series). Washington, DC: World Bank. Http://hdl.handle.net/10986/10656.

[17] Karamti, C., 2016. Measuring the Impact of ICTs on Academic Performance: Evidence From Higher Education in Tunisia. *Journal of research on technology in education*, 48(4), pp.322–337. Available from: https://doi.org/10.1080/15391523.2016.1215176.

[18] Khoudri, I. and Zeriouh, M., 2023. Learner Autonomy during COVID-19: The Case of Moroccan EFL Undergraduates. *Journal of English Language Teaching and Linguistics*, 8(2), pp.139–156. Available from: https://doi.org/10.21462/jeltl.v8i2.1043.

[19] Lamkhanter, F., 2022. Learner Autonomy: Attitudes and Practices of Moroccan University Students in English Departments. *International Journal of Language and Literary Studies*, 4(1), p.189–207. Available from: https://doi.org/10.36892/ijlls.v4i1.811.

[20] Liang, J.C., Hwang, G.J., Chen, M.R.A. and Darmawansah, D., 2023. Roles and research foci of artificial intelligence in language education: an integrated bibliographic analysis and systematic review approach. *Interactive Learning Environments*, 31(7), pp.4270–4296. Available from: https://doi.org/10.1080/10494820.2021.1958348.

[21] Loganathan, N. and Hashim, H., 2020. Millennial Teachers' Use of Technology in ESL Classroom: A Review of Literature. *International Journal of Academic Research in Business and Social Sciences*, 10(12), pp.907–923. Available from: https://doi.org/10.6007/ijarbss/v10-i12/8098.

[22] Marzuki, Indrawati, I. and Yunus, I.H., 2023. Teachers' Challenges in Promoting Learner Autonomy. *Pioneer: Journal of Language and Literature*, 15(1), pp.119–137. Available from: https://doi.org/10.36841/pioneer.v15i1.2853.

[23] Moradi, H., 2022. An exploration of autonomy, agency and identity in EFL contexts - (Mark) Feng Teng, Autonomy, Agency and Identity in Teaching and Learning English as a Foreign Language. Singapore: Springer, 2019. Pp. i-xii+132. Hardback £74.99, ISBN 978-981-13-0727-0. *English today*, 38(1), p.63–65. Available from: https://doi.org/10.1017/S026607842000053X.

[24] Oxford, R.L., 1990. *Language Learning Strategies: What Every Teacher Should Know*. Boston: Heinle & Heinle Publishers.

[25] Pellerin, M., 2017. Rethinking the Concept of Learner Autonomy within the MALL Environment. In: M. Cappellini, T. Lewis and A. Rivens Mompean, eds. *Learner Autonomy and Web 2.0*. Equinox, Advances in CALL Research and Practice, pp.91–114.

[26] Ponce, O.A. and Pagán-Maldonado, N., 2015. Mixed Methods Research in Education: Capturing the Complexity of the Profession. *International Journal of Educational Excellence*, 1(1), pp.111–135. Available from: https://doi.org/10.18562/ijee.2015.0005.

[27] Qutub, M.M.T., Bukhari, S.S.F., Fadel, S.A. and Aljuhani, H.S.A., 2023. The Future of English as a Foreign Language Teaching and Learning in View of the Fourth Industrial Revolution in the MENA Region. *Arab World English Journal*, (9), p.67–86. Available from: https://doi.org/10.24093/awej/call9.5.

[28] Reinders, H., 2007. Big Brother Is Helping You: Supporting Self-Access Language Learning with a Student Monitoring System. *System: An International Journal of Educational Technology and Applied Linguistics*, 35(1), pp.93–111. Available from: https://www.learntechlib.org/p/102407.

[29] Reinders, H. and Hubbard, P., 2013. CALL and Learner Autonomy: Affordances and Constraints. In: M. Thomas, H. Reinders and M. Warschauer, eds. *Contemporary Computer-Assisted Language Learning*. New York: Continuum, chap. 19, pp.359–375. Available from: https://innovationinteaching.org/docs/chapter-2012-Reinders-and-Hubbard.pdf.

[30] Stensmo, C., 2008. *Ledarskap i klassrummet*. 2nd ed. Lund: Studentlitteratur.

[31] Suherdi, D., 2017. *English teacher education for the 21st century Indonesia: synergizing character building and academic achievement*. Bandung: UPI Press.

[32] Xu, B., Stephens, J.M. and Lee, K., 2024. Assessing Student Engagement in Collaborative Learning: Development and Validation of New Measure in China. *The Asia-Pacific Education Researcher*, 33(2), pp.395–405. Available from: https://doi.org/10.1007/s40299-023-00737-x.