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PAPER

The Influence of E-Assessment on Students' Cognitive Engagement in Higher Education

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ABSTRACT

The electronic assessment, or e-assessment, is one of the most important topics to address, especially considering the transformations that higher education is undergoing in the digital age. In this study, we examine the effect of e-assessment on students' cognitive engagement. By employing a quantitative approach, we conducted a survey using questionnaires to gather data from 41 students in the Faculty of Arts and Humanities at Hassan II University in Casablanca and 105 students' teachers from the El Jadida regional center for education and training. The main aim of this study is to demonstrate the influence of e-assessment on students' cognitive engagement. The participants were divided into two groups: the first group included 41 students from the Faculty of Arts and Humanities, with 20 students participating in the traditional paper-based assessment and 21 students undergoing e-assessment through the Kahoot platform. The second group comprises 105 trainee teacher students from the regional center for education and training professions in El Jadida, with 65 students undergoing paper assessment and 40 students undergoing e-assessments. Our questionnaire assessed the impact of e-assessment on participants' cognitive engagement. The Cronbach's alpha value was 0.959 for the first group and 0.982 for the second group. According to the results of the study, e-assessment influences cognitive engagement. However, students subjected to traditional paper-based evaluations show less commitment and involvement in courses.

KEYWORDS

electronic assessment (e-assessment), cognitive engagement, Kahoot, higher education

1 INTRODUCTION

Assessment is recognized as an integral part of the teaching-learning process and is omnipresent in our universities in a variety of ways. This is because it enhances learning and improves student performance in higher education [1]. Similarly, continuous assessment in higher education is a powerful tool for supporting students' self-regulation and fostering their active engagement in the

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learning process [2]. Nevertheless, traditional assessment practices can sometimes result in a lack of interaction and dynamism, which may lead to a decrease in students' cognitive engagement. For this purpose and in higher education, the increasing integration of information and communication technologies (ICT) has led to a growing interest in the use of electronic assessment (e-assessment) platforms as a pedagogical tool.

In the digital age, e-assessment has become a necessity in Moroccan universities, if not an obligation. Above all, the integration of e-assessment into higher education offers students unique opportunities for active engagement, rapid feedback, and the development of essential skills for their future professional careers [3].

In this paper, we identify some of the difficulties associated with traditional assessment as opposed to e-assessment and formulate the research problem that emerges. The concepts of ICT, cognitive engagement, traditional assessment, and e-assessment are then defined before identifying the research objectives. The methodology is presented, followed by an overview of the results and then the interpretations. To conclude, we propose several suggestions and recommendations for platforms and applications that can be utilized within the context of dynamic e-assessment to completely replace traditional assessment methods.

2 PROBLEM STATEMENT

Assessment is one of the most crucial pillars of pedagogical action, playing a vital role in student learning and the acquisition and organization of knowledge.

In the traditional sense, assessment on most Moroccan campuses takes the form of tests or exams and involves numerical grading. This method often causes stress, leading to discouragement and demotivation among students, especially during busy evaluation periods. These periods are characterized by the appearance of a whole range of negative emotions: stage fright, anxiety, irritability, worry, and fear [4]. In this context, we conducted a semi-directive exploratory interview with the students who are the subject of this research. This interview covers four themes.

1. **Students' personal experience of assessment:** Nearly 99.3% of students confirmed that they have been faced with assessments in the form of written exams and/or group projects, leading to feelings of stress and panic.
2. **Cognitive engagement:** Approximately 93.67% of respondents report that assessment inhibits students' critical thinking because they are frequently given recycled questions and tests with only minor changes or slightly rephrased versions, leading them to adopt a passive attitude towards the course. They perceive these assessments as burdens on their short-term memory, lacking the need for active engagement in the learning process. Students simply memorize the answers to questions that might be asked during the assessments.
3. **Factors influencing cognitive engagement:** 82% of the students interviewed stated that the factors influencing their cognitive engagement were fear of failure and the pressure of grades during assessments. They also felt that a variety of assessment types could promote greater cognitive engagement.

4. **Suggestions and prospects:** For this theme, students have converged on the idea that teachers play a crucial role in reinforcing students' cognitive engagement. This is achieved through constructive feedback, personalized encouragement, and the adoption of interactive assessment methods that can stimulate their cognitive engagement throughout the learning process.

Examining the results of this interview, it becomes clear that students' cognitive engagement is judged to be low because of the application of traditional classroom assessment practices.

On the other hand, the emergence of ICTs has opened up new horizons in the field of assessment, particularly with the use of e-assessment in universities. This involves leveraging various computer tools and interactive applications or platforms to "*evaluate the student's performance at a specific and unique moment, and assist them while they perform the task*" [5]. And provide him with immediate feedback to help him perform well.

The faculty of letters and human sciences (FLSH) at Ben M'sik and the regional center for education and training (CRMEF) at El Jadida in the Casa-Settat region are also confronted with a challenging situation regarding their traditional evaluation practices.

Faced with this situation, an important question emerges: What influence does dynamic e-assessment have on students' cognitive engagement? Can dynamic e-assessment enhance the cognitive engagement of higher education students?

3 CONCEPTUAL FRAMEWORK

Following our research question, which aims to measure the influence of e-assessment on students' cognitive engagement, our conceptual framework will primarily focus on the following concepts:

- ICTE and learning assessment
- Dynamic e-assessment
- Theoretical foundations of e-assessment
- Kahoot
- Cognitive engagement

3.1 ICTE and learning assessment

Assessment at the university level is becoming a crucial issue in many countries [6]. Morocco is one of those countries where all universities place great emphasis on learning assessment. As a result, the integration of ICTE has become essential for higher education to bring multiple benefits to the assessment process.

For a relevant assessment, it is necessary to take advantage of new ICTs as an indispensable resource for the smooth running of this phase [7]. This is especially crucial, as ICTE is of vital importance in keeping the assessment process on track. In fact, they simplify student assessment and monitoring while promoting self-assessment [8].

In a nutshell, we would like to emphasize that ICTE can make several contributions to evaluation, which we can summarize in these three points [7]:

1. Designing computerized interactive and multimedia assessments.
2. Create a user-friendly interface and an active, motivating assessment environment.
3. Assist the teacher in thoroughly analyzing the information obtained from an assessment.

3.2 Dynamic e-assessment

Today, technology is considered one of the most important aspects of knowledge acquisition and development [9]. As a result, many assessors are using technology to assess students by adopting a dynamic e-assessment that differs from traditional assessment in its interactive form. This approach is designed to encourage metacognition and self-regulation in students, which are essential characteristics for cognitive engagement [10]. The significance of this type of assessment lies in its capacity to substantially decrease the effort and time required to categorize students based on their levels. Furthermore, it assists students in enhancing their performance by providing instant feedback and promptly communicating the assessment results. In other words, the dynamic particularity of this form of assessment stems from its continuous interactivity, where students test their knowledge by actively applying the concepts covered in the course. According to Stolberg [11], e-assessment is an effective means of fostering cognitive engagement and deep learning among students.

In his studies, Wang states that dynamic e-assessment particularly influenced learners with more limited prior knowledge [12]. Nevertheless, implementing this form of assessments is challenging, as it implies changes in teachers' assessment practices, and they don't always have the practical and theoretical resources to do so [13].

It remains to be pointed out that there are several interactive tools for implementing dynamic e-assessment that allow instant interaction with students. An example of such a tool is the Kahoot platform, which will be utilized in this study.

3.3 Theoretical foundations of e-assessment

Throughout the history of education, various learning theories have emerged, giving rise to a diversity of pedagogical methods and teaching models. Whether in learning, teaching, or assessment, each evaluation model is distinguished by a specific design and is thus linked to a pedagogical approach [28].

In this section, we look at a number of learning theories in relation to e-assessment.

Behaviorism and e-assessment. Behaviorism focuses on the observable behaviors of individuals, setting aside the internal mental processes involved in learning. According to the behaviorist perspective, learning occurs when the learner provides an appropriate response to a given stimulus [29]. It emphasizes the behavioral dimension rather than the mental dimension, unlike cognitivism [28].

The use of e-assessment can be aligned with the principles of behaviorism because it focuses on observable behaviors and is often conducted using objectively corrected tests.

Constructivism and e-assessment. Constructivism is a learning theory closely linked to e-assessment, emphasizing the learner's active role in the construction of

their knowledge. After briefly describing constructivism as a theory of learning, it becomes clear that it postulates that students construct their knowledge by working out their own understanding of the world [30]. Constructivism emphasizes the importance of the student's active involvement in the learning process. Students play a crucial role in managing and controlling their learning, while e-assessment appears to contribute to student engagement and motivation [31]. Encouraging individuals to test themselves more frequently, similar to an electronic game where they compete with the machine to enhance and increase their score [32]. The constructivist approach also emphasizes the significance of feedback in the learning process [33]. It serves primarily to actively enhance the student's learning [34]. In e-assessment, significant importance is placed on feedback, which is considered an essential element in promoting learning. Rapid and sufficient feedback, received by the student and designed to capture their attention, is crucial [35].

Cognitivism and e-assessment. Cognitivism posits that the student functions as an active information-processing system akin to a computer. It perceives information from its environment, recognizes it, memorizes it, and then retrieves it from its memory when needed to understand its environment or solve problems [36]. It also emphasizes the study of mental processes.

In essence, cognitivism focuses on how the brain receives and processes information during the learning process. In the same way, e-assessment enables students to process information and evaluate their cognitive processes by conducting memory and mental function tests. It plays a role in students' cognitive functioning, helping to control and guide the task at hand [37].

3.4 Kahoot

Kahoot is a game-based learning platform for reinforcing and assessing learning progress in the classroom. It's a game-based student response system where the classroom is temporarily transformed into a game show. The teacher acts as the game show host, and the students are the contestants [14]. This system allows teachers to create their own content, conduct quizzes, and assess students. Students can participate without the need for registration, ensuring they can play without feeling embarrassed [15]. All that is required is a tablet or smartphone; there is no need to create an account, just a PIN code.

Kahoot also allows students to assess themselves by observing their own and their peers' achievements in real-time on the room screen, displayed by the teacher.

It's a game-based mobile assessment platform [15]. According to Huseyin Uzunboylu et al., "Kahoot" is a learning application used to assess students' knowledge and provide them with a break from the traditional way of acquiring knowledge in the classroom [16].

3.5 Cognitive engagement

Students' cognitive engagement is an essential element of academic success and is positively linked to academic achievement. It encompasses the way in which students become mentally involved in the learning process, making intellectual efforts to understand, analyze, and synthesize the information presented in courses. It is a process that enables them to build knowledge systems and acquire results using appropriate learning strategies [17].

Cognitive engagement is determined by the deployment of study and learning strategies aimed at mastering the concepts covered, in other words, engaging in in-depth learning [18]. However, the low level of cognitive engagement means that learning takes place superficially, relying on rote learning and memorization.

In conclusion, we can say that students are engaged when they actively participate in the learning process, utilizing their cognitive and intellectual capacities, and demonstrating deep reflection, comprehensive understanding, and active application of knowledge.

4 RESEARCH OBJECTIVES AND HYPOTHESES

Our study is part of an academic research approach aimed at examining whether e-assessment influences the cognitive engagement of students in higher education. We are conducting a comparative analysis to measure the influence of dynamic e-assessment using the "Kahoot" platform on the cognitive engagement of students at the Ben M'sik faculty, as well as on the cognitive engagement of student teacher trainees at the Centre regional des métiers de education et de la formation (CREMF) in El Jadida.

We aim to compare the cognitive engagement of two groups of students from the Ben Msik faculty: one group assessed with Kahoot and another group undergoing a traditional paper-based assessment. We will also compare the cognitive engagement of two other groups of student teachers, one group assessed with Kahoot, and another group assessed on paper.

The impact of e-assessment on school performance, achievement, and engagement has been the focus of a significant amount of academic research and study. Drawing on some of this research, such as the study that reported that increasing engagement, motivation, enjoyment, and concentration can improve learning performance and classroom dynamics as a goal of Kahoot [19], and that Kahoot has a positive impact on classroom engagement by increasing student interaction and involvement in lessons [20], we can hypothesize the following:

H: Dynamic e-assessment influences higher education students' cognitive abilities. Engagement.

5 METHODS

5.1 Sampling

Our sample consisted of 41 third-year students from Ben M'sik's Faculty of Letters and Humanities (FLSH), specializing in social accompaniment and enrolled in the Project Management course. They are divided into two distinct groups: an experimental group of 21 students, including 11 girls who use the Kahoot application in their assessment; and a control group of 20 students, including 13 girls, assessed in the traditional way on paper. A further 80 primary school student teachers are also part of the sample, divided equally into two groups: a group of 40 student teachers, including 29 girls, assessed via Kahoot, and a control group of 40 student teachers, including 32 girls, assessed on paper.

What's more, all the students involved in this study, whether from the Faculty of Humanities or from the regional center for education and training, follow a

classroom-based learning mode before undergoing e-assessment. This form of teaching, which typically involves lectures, encourages passivity among students and restricts interaction, thereby impeding their engagement in the learning process. Similarly, assessments are often conducted through written exams, which may not entirely reflect the student's genuine comprehension. Some students excel at memorizing information without grasping the underlying concepts. Moreover, there is a deficiency of feedback on prompting their comprehension throughout the course. This poses a challenge, especially for individuals who require prompt corrections to make progress.

It's important to note that lectures often require additional strategies to enhance student learning, such as incorporating active teaching methods both in the classroom and during assessments.

In addition, the teachers participating in this study are confronted with a constantly evolving educational environment where technology plays a pivotal role. They occasionally utilize university-provided platforms to enhance the delivery of their courses, aiming for a more engaging and inclusive learning experience.

5.2 Data collection system

We opted for quantitative research, which involved gathering large amounts of factual information. This study involved a written questionnaire administered to students at the Faculty of Letters and Humanities in Ben M'sik, as well as to student teachers at the CRMEF in El Jadida. The questionnaire allowed us to interview a larger number of individuals, which, in turn, enabled us to collect data from multiple sources. Despite this, out of the 121 questionnaires distributed, only 110 students responded to our survey.

Our questionnaire aims to measure students' cognitive engagement with Kahoot assessment (e-assessment), with the goal of verifying its impact on their engagement. It comprises 10 items, including nine Likert-type items ranging from 1 (always) to 5 (never), plus one closed-ended question.

The analysis of internal consistency among the items in our questionnaire indicates a strong association between them, with high internal consistency indices (Cronbach's α of 0.959 and 0.982 for the questionnaires completed by FLSH and CREMF students, respectively) (refer to Table 1).

Table 1. Reliability statistics

	Variables	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
FLSH	Cognitive engagement	.959	.972	10
CREMF		.982	.989	10

6 RESULTS

We used the Mann-Whitney U test to test the research hypothesis. Table 2 displays the cognitive engagement test conducted with students from the Faculty of Arts and Humanities, while Table 3 presents the cognitive engagement test conducted with student teachers.

Table 2. Cognitive engagement test (FLSH Ben M'sik)

Items	Type of Assessment	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P
I can't wait to be assessed	e-assessed group	21	11.38	239.00	412.00	0.00
	group assessed on paper	20	31.10	622.00		
	Total	41				
I get excited when I'm assessed	e-assessed group	21	11.00	231.00	420.00	0.00
	group assessed on paper	20	31.50	630.00		
	Total	41				
I find formative assessment fun and interesting	e-assessed group	21	11.50	231.00	420.00	0.00
	group assessed on paper	20	31.50	630.00		
	Total	41				
I like the competitiveness of formative assessment	e-assessed group	21	11.00	231.00	420.00	0.00
	Group assessed on paper	20	31.50	630.00		
	Total	41				
formative assessment allows me to measure my skill level	e-assessed group	21	12.98	272.50	378.50	0.00
	group assessed on paper	20	29.43	588.50		
	Total	41				
I persevere to understand the course and pass the formative assessment	e-assessed group	21	11.00	231.00	420.00	0.00
	Group assessed on paper	20	31.50	630.00		
	Total	41				
I focus on the classroom course to answer formative assessment questions	e-assessed group	21	11.00	238.50	412.50	0.00
	group assessed on paper	20	31.13	622.50		
	Total	41				
I take part in the lesson and ask for clarification if I don't understand the lesson, in order to answer the formative assessment questions	e-assessed group	21	11.00	231.00	420.00	0.00
	group assessed on paper	20	31.50	630.00		
	Total	41				
I take notes during the teacher's explanations in order to answer the formative assessment questions	e-assessed group	21	11.00	231.00	420.00	0.00
	group assessed on paper	20	31.50	630.00		
	Total	41				

The influence of e-assessment on cognitive engagement was tested using the Mann-Whitney U test. Based on the findings presented in Table 2, e-assessment has a significant impact on cognitive engagement in relation to the following items: "I can't wait to be assessed" [Mann-Whitney U = 412.000; P = 0.000 < 0.05], "I get excited when I'm evaluated" [Mann-Whitney U = 420.00; P = 0.000 < 0.05], "I find formative assessment fun and interesting" [Mann-Whitney U = 420.00; P = 0.00 < 0.05], I like the competitiveness of formative assessment [Mann-Whitney U = 420.00; P = 0.000 < 0.05], "Formative assessment allows me to measure my skill level" [Mann-Whitney U = 378.50; P = 0.00 < 0.05], "I persevere to understand the course and pass the formative assessment." [Mann-Whitney U = 420.00; P = 0.000 < 0.05]. I focus on the classroom

course to answer formative assessment questions [Mann-Whitney U = 412.50; P = 0.000 < 0.05]. I take part in the lesson and ask for clarification if I don't understand the lesson in order to answer the formative assessment questions [Mann-Whitney U = 420.00; P = 0.000 < 0.05]. I take notes during the teacher's explanations to answer the formative assessment questions. [Mann-Whitney U = 420.00; P = 0.000 < 0.05].

Table 3. Cognitive engagement test (CRMEF)

Items	Type of Assessment	N	Mean Rank	Sum of Ranks	Mann-Whitney U	P
I can't wait to be evaluated	e-assessed group	40	20.94	837.50	2582.50	0.00
	group assessed on paper	65	72.73	4727.00		
	Total	105				
I get excited when I'm assessed	e- assessed group	40	20.50	820.00	2600.00	0.00
	group assessed on paper	65	73.00	4745.00		
	Total	105				
I find formative assessment fun and interesting	e-assessed group	40	20.50	820.00	2600.00	0.00
	group assessed on paper	65	73.00	4745.00		
	Total	105				
I like the competitiveness of formative assessment	e-assessed group	40	20.54	821.50	2598.50	0.00
	group assessed on paper	65	72.98	4743.50		
	Total	105				
Formative assessment allows me to measure my skill level	e-assessed group	40	20.53	821.00	2599.00	0.00
	group assessed on paper	65	72.98	4744.00		
	Total	105				
I persevere to understand the course and pass the formative assessment	e-assessed group	40	20.50	820.00	2600.00	0.00
	Group assessed on paper	65	73.00	4745.00		
	Total	105				
I focus on the classroom course to answer formative assessment questions	e-assessed group	40	20.58	823.00	2597.00	0.00
	group assessed on paper	65	72.95	4742.00		
	Total	105				
I take part in the lesson and ask for clarification if I don't understand the lesson, in order to answer the formative assessment questions	e-assessed group	40	20.51	820.50	2599.50	0.00
	group assessed on paper	65	72.99	4744.50		
	Total	105				
I take notes during the teacher's explanations in order to answer the formative assessment questions.	e-assessed group	40	20.50	820.00	2600.00	0.00
	group assessed on paper	65	73.00	4745.00		
	Total	105				

The influence of e-assessment on cognitive engagement was tested using the Mann-Whitney U test. According to the data presented in Table 3, e-assessment has a significant impact on cognitive engagement in the following aspects: "I can't wait to be assessed" [Mann-Whitney U = 2582.50; P = 0.000 < 0.05], "I get excited

when I'm evaluated" [Mann-Whitney U = 2600.00; P = 0.000 < 0.05], "I find formative assessment fun and interesting" [Mann-Whitney U = 2600.00; P = 0.00 < 0.05], "I like the competitiveness of formative assessment" [Mann-Whitney U = 2598.50; P = 0.000 < 0.05].

"Formative assessment allows me to measure my skill level" [Mann-Whitney U = 2599.00; P = 0.00 < 0.05], and "I persevere to understand the course and pass the formative assessment." [Mann-Whitney U = 2600.00; P = 0.000 < 0.05]. I focus on the classroom course to answer formative assessment questions [Mann-Whitney U = 2597.00; P = 0.000 < 0.05]. I take part in the lesson and ask for clarification if I don't understand the lesson in order to answer the formative assessment questions [Mann-Whitney U = 2599.50; P = 0.000 < 0.05]. I take notes during the teacher's explanations to answer the formative assessment questions. [Mann-Whitney U = 2600.00; P = 0.000 < 0.05].

7 DISCUSSION

This study aims to investigate the influence of e-assessment on students' cognitive engagement in a higher education context. The results of this study, reported earlier in Tables 2 and 3, show that the p-value is less than 0.001 for all items. This demonstrates the high significance of the results, confirms the stated hypothesis, and indicates an influence of e-assessment on the cognitive engagement of higher education students. This result confirms what several authors have said about e-assessment and its role in improving learning, motivating students, and increasing their engagement. According to Lajane et al. (2020) [21], formative e-assessment is an innovative pedagogical practice for improving learning and has a positive effect on it. Similarly, Gikandi et al. (2011) [22] found in their literature review that e-assessment promotes student engagement and the development of a learning community, which is confirmed in the present study. Again, our study enabled us to conclude that formative e-assessment represents an approach that allows students to receive immediate feedback on the obstacles they encounter and their learning difficulties, while enhancing their cognitive engagement. According to Vonderwell et al. (2007), e-assessment also facilitates and accelerates the transmission of constructive feedback to students, which is immediate and easy to present [23]. An analysis of the literature on e-assessment has also revealed its significant educational potential, particularly its impact on students' cognitive engagement and involvement in their learning. For example, Chemsi (2019) [24] confirmed the effect of formative e-assessments on students' behavioral engagement and involvement in completing formative assessments. Furthermore, the findings of Bahati (2019) [25] reveal that students are satisfied with formative e-assessment strategies as well as the quality of feedback. Siemens et al. (2011) [26] agreed that e-assessment enables faster, more efficient, and fairer assessment, reducing teachers' workload and offering students a more transparent and objective assessment experience.

In short, e-assessment stimulates students' deep thinking by encouraging them to analyze and synthesize key concepts, fostering deeper cognitive engagement in their learning and enhancing knowledge retention.

8 CONCLUSION

In this study, we utilized a quantitative study to emphasize the relationship between e-assessment and students' cognitive engagement. We first conducted an

exploratory validation of various scales in our questionnaire. More specifically, we examined the impact on cognitive engagement. Our finding indicates that e-assessment has a significant influence of e-assessment on the cognitive engagement of university students. Those who underwent e-assessment demonstrated a higher level of cognitive engagement in their learning compared to those who experienced traditional paper-based assessment.

The quality of learning is closely linked to the quality of student interaction and engagement during training [26]. In this context, the adoption of e-assessment is of crucial importance as it enables us to maintain and amplify this commitment by offering interactive assessment methods tailored to the digital world. At the same time, we encourage students to learn effectively by assisting them to transfer what they have learned. A number of research studies in the field of education suggest that ICT have the potential to help students delve deeper into certain aspects of their cognitive engagement, such as reasoning, the use of learning strategies, and the presentation and visualization of knowledge (Condie and Munro, 2007; Passey et al., 2004) [27]. In this sense, our paper has attempted to shed light on the importance of assessment through ICT, specifically e-assessment, and its positive contribution to students' cognitive engagement in a higher education context.

It's important to stress that Kahoot is not an end in itself but rather a tool whose use is of great importance. Indeed, there are several applications and platforms designed to facilitate dynamic online assessment, such as Quizziz, Blackboard Learn, ProProfs Quiz Maker, Socrative, Edmodo, and many others.

9 METHODOLOGICAL STRENGTHS AND LIMITATIONS OF THE STUDY

The strength of this study lies in its ability to raise teachers' awareness of the fundamental importance of e-assessment in promoting and enhancing students' cognitive engagement. The aim is to encourage teachers to integrate this approach into their assessment practices by exploring different platforms, with Kahoot being just one example.

As a limitation of this study, it should be noted that teachers sometimes encounter challenges when integrating ICT into their teaching and assessment practices. These challenges include issues such as the limited availability of smartphones and internet connectivity constraints for some students.

10 RECOMMENDATIONS AND FUTURE RESEARCH

The conclusions of our study led us to make several suggestions and recommendations for engaging students and empowering them as active participants in their learning process. This could be achieved by encouraging teachers to create a dynamic e-assessment environment that motivates students to actively engage in their learning process.

The teacher should, therefore:

- Clearly communicates learning objectives and assessment criteria.
- Adopts formative assessments to measure understanding and guide learning simultaneously.
- Uses assessment results to adjust instruction and provide additional support as needed.

- Select technology wisely to match teaching style and student needs;
- Encourages and values students' progress and efforts through symbolic rewards and special mentions.
- Regularly communicates with students about the assessment process, results, expectations, and available resources to support their success.

As a first avenue of future research associated with this study, it could be relevant for teachers to enhance their competence in ICT. Their integration into the teaching, learning, and evaluation process could enhance students' cognitive engagement and potentially contribute to their academic success. This perspective will be the focus of our next academic research project.

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