

Learning and Teaching in the Digital Age Using the ELMED Platform in Preparing Baccalaureate Students: A Field Study in Bechar, Algeria

التعلم والتعليم في العصر الرقمي: دراسة تحليلية لاستخدام منصة ELMED في إعداد تلاميذ شهادة البكالوريا – دراسة ميدانية بولاية بشار، الجزائر

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Abstract

This study examines the role of digital learning platforms in contemporary education, with a specific focus on the use of the ELMED platform in preparing Baccalaureate students in Bechar, Algeria. The research adopts a quantitative approach to investigate students' learning practices and perceptions regarding the platform's educational value. It was conducted with a sample of 90 Baccalaureate students. Data were collected using a structured questionnaire designed to explore patterns of use, perceived benefits, and challenges associated with the platform. The data were analyzed using descriptive statistical techniques. Findings indicate that the ELMED platform plays a significant supportive role in students' exam preparation by enhancing access to learning materials, promoting autonomous learning, and improving overall engagement with academic content. However, the results also reveal several constraints, including limited internet access, varying levels of digital literacy, and motivational difficulties among some learners. The study concludes that while digital platforms such as ELMED constitute valuable supplementary educational tools, their effectiveness depends on addressing infrastructural and pedagogical challenges. The findings contribute to a better understanding of digital learning adoption in secondary education within the Algerian context.

Keywords: Digital learning, e-learning platforms, ELMED platform, Baccalaureate students, academic achievement, autonomous learning, secondary education, Algeria.

المخلص:

تهدف هذه الدراسة إلى استكشاف دور منصات التعلم الرقمية في التعليم المعاصر، مع التركيز بشكل خاص على استخدام منصة ELMED في إعداد تلاميذ شهادة البكالوريا بولاية بشار، الجزائر. وتعتمد الدراسة على المنهج الكمي من أجل تحليل ممارسات التعلم لدى التلاميذ واستكشاف تصوراتهم حول القيمة التعليمية للمنصة. وقد أجريت الدراسة على عينة مكونة من 90 تلميذاً من تلاميذ البكالوريا. تم جمع البيانات باستخدام استبيان مُنظَّم صُمِّم لاستكشاف أنماط الاستخدام، والفوائد المدركة، والتحديات المرتبطة باستخدام المنصة. كما تم تحليل البيانات باستخدام الأساليب الإحصائية الوصفية. أظهرت النتائج أن منصة ELMED تؤدي دوراً داعماً مهماً في تحضير التلاميذ للامتحانات، من خلال تعزيز الوصول إلى الموارد التعليمية، وتشجيع التعلم الذاتي، وتحسين مستوى التفاعل مع المحتوى الدراسي. ومع ذلك، كشفت النتائج أيضاً عن وجود مجموعة من التحديات، من بينها محدودية الوصول إلى الإنترنت، وتفاوت مستويات الكفاءة الرقمية، بالإضافة إلى صعوبات تحفيزية لدى بعض المتعلمين. وتخلص الدراسة إلى أن المنصات الرقمية، مثل منصة ELMED، تمثل أدوات تعليمية مكتملة ذات قيمة، إلا أن فعاليتها تظل رهينة بتجاوز التحديات البيداغوجية والبنوية. وتسهم هذه الدراسة في تعميق فهم تبني التعلم الرقمي في مرحلة التعليم الثانوي في السياق الجزائري.

الكلمات المفتاحية:

التعلم الرقمي، منصات التعلم الإلكترونية، منصة ELMED، تلاميذ البكالوريا، التحصيل الدراسي، التعلم الذاتي، التعليم الثانوي، الجزائر

1. Introduction

The rapid integration of digital technologies into educational systems has significantly transformed traditional teaching and learning practices. In recent years, digital learning platforms have emerged as essential tools that support both instructors and learners by providing flexible access to educational content, enhancing interactivity, and promoting learner autonomy. This shift reflects a broader global movement toward technology-enhanced education, where digital resources complement and sometimes extend classroom instruction.

In Algeria, the Baccalaureate examination represents a critical academic milestone that determines students' access to higher education and future career pathways. Given the high stakes of this examination, students increasingly rely on supplementary learning resources beyond traditional classroom teaching. Among these resources, digital platforms such as ELMED have gained considerable attention due to their accessibility and their alignment with curricular requirements.

Despite the growing adoption of such platforms, there remains a lack of empirical research examining their actual pedagogical impact within the Algerian secondary education context, particularly in southern regions such as Bechar. It is therefore important to understand how students engage with these platforms, how they perceive their usefulness, and to what extent these tools contribute to their academic preparation. In this context, the present study aims to investigate the use of the ELMED platform among Baccalaureate students in Bechar, Algeria, focusing on its role in supporting learning processes and examination preparation.

2. Research Questions

This study seeks to address the following research questions:

1. How do Baccalaureate students use the ELMED platform in their learning and exam preparation?

2. What are students' perceptions of the educational value of the ELMED platform?

3. What benefits do students gain from using the ELMED platform?

4. What challenges do students face when using this digital learning platform?

3. Hypotheses

Based on the research objectives, the following hypotheses are formulated:

- **H1:** The use of the ELMED platform positively contributes to students' academic preparation for the Baccalaureate examination.

- **H2:** The ELMED platform enhances students' learning autonomy and engagement.

- **H3:** Students encounter technical, motivational, and accessibility-related challenges when using the ELMED platform.

- **H4:** There is a significant relationship between frequent use of the platform and improved perceived academic understanding.

4. Literature Review

4.1 Digital Learning and Educational Technology

In the contemporary literature, an educational platform (also called an e-learning platform or virtual learning environment) is defined as a digital environment specifically designed to manage, deliver, and host online education, integrating tools for content delivery, interaction, assessment, and tracking of learner progress (Unesco, 2025). Educational platforms are digital environments that facilitate learning and teaching through various online tools and resources, providing access to courses, materials, and interactive activities that extend education beyond the traditional classroom. (Unesco, 2025).

Digital learning refers to the use of electronic technologies to access educational curriculum outside of a traditional classroom setting. It includes online platforms, virtual environments, multimedia resources, and interactive tools that facilitate teaching and learning processes. According to Bates (2019), digital learning represents a shift toward more flexible, student-centered education where learners can control time, pace, and place of study. Similarly, Anderson (2011) defines online learning as a structured educational experience delivered through the internet, emphasizing interaction between learners, content, and instructors. This interaction is considered a key factor in improving learning outcomes in digital environments.

4.2 Types of Digital Learning Platforms

Digital learning platforms can be categorized into several types based on their function and pedagogical design:

1. Learning Management Systems (LMS): these systems, such as Moodle, are designed to organize and deliver educational content, manage assessments, and track student progress.

2. Content-Based Platforms: these platforms focus primarily on providing educational materials such as videos, summaries, and lessons. ELMED can be considered within this category as it offers structured academic content for exam preparation.

3. Interactive Learning Platforms: these include tools that promote active learning through quizzes, discussions, and real-time feedback, enhancing student engagement and participation.

Within this broad category, ELMED is understood as a commercial, secondary-level learning platform that provides curriculum-aligned lessons for all secondary subjects, summaries, solved exercises, and a large collection of past baccalaureate exams, available through a mobile-first architecture and a subscription-based model (ELMED, 2022). ELMED-type platforms therefore share key characteristics with commercial exam-preparation and e-learning destinations that emphasize self-paced revision, extensive question banks, and progress tracking, often operating outside formal classroom settings (ISpring, 2026).

2.1 Components of the conceptual framework

The conceptual framework of this study is built around three main components that together explain how ELMED-type platforms are used by pre-baccalaureate students in Bechar and how this use relates to their learning outcomes and preparedness. These components are:

1. The educational-platform level

ELMED is treated as a digital learning environment that mediates interaction between students, content, and assessment tools, shaping how students access lessons, practice exercises, and past exams (Bennia et al., 2025).

2. The learner-level factors

This level focuses on students' digital literacy, motivation, autonomy, and study strategies when using ELMED for exam-oriented revision, drawing on recent research on digital-learning technologies at the secondary level. (Bennia et al., 2025)

3. The institutional and socio-economic context

This component considers the Algerian baccalaureate system, the semi-urban context of Bechar, and infrastructural constraints such as internet access, device availability, and school-level support, which condition how effectively students can use platforms like ELMED (Training, 2023).

4.3ELMED Platform in the Algerian Educational Context

In the context of digital transformation in education, national online learning platforms have emerged as important supplementary tools to support students' academic preparation. Among these platforms, ELMED has gained increasing attention in Algeria as a structured digital learning environment designed primarily for secondary school students, especially those preparing for high-stakes examinations such as the Baccalaureate. ELMED can be defined as a web-based educational platform that provides curriculum-aligned content, including lesson summaries, explanatory videos, practice exercises, and revision materials across different academic subjects. Its primary pedagogical objective is to reinforce classroom instruction by offering students additional opportunities for autonomous learning and continuous revision outside school hours.

From an educational perspective, ELMED functions as a content-delivery and revision support system that promotes flexible learning practices. It enables students to access materials at any time, which aligns with the principles of self-paced and learner-centered

education emphasized in digital learning theories (Bates, 2019; Anderson, 2011). In this sense, the platform contributes to strengthening learner autonomy and improving exam preparedness. Furthermore, the increasing use of ELMED reflects broader trends in the Algerian education system toward integrating digital tools to enhance accessibility and educational equity. However, as with other digital learning environments, its effectiveness depends on students' digital literacy, motivation, and access to stable internet connectivity, which remains uneven across different regions.

Although empirical studies specifically focusing on ELMED are still limited, its pedagogical structure is consistent with international models of online revision platforms that support exam-oriented learning through structured content delivery and practice-based reinforcement. Conceptually, the study proposes that the use of an ELMED-type platform influences students' learning practices, motivation, and baccalaureate preparedness, with the strength and nature of this influence being moderated by students' digital literacy, school-level support, and the local socio-technical context in Bechar" (Bennia et al., 2025). This framework situates the study within broader debates on digital inequality, commercialization of education, and data-driven learning environments, while keeping the focus on how a specific platform is used by pre-baccalaureate students in an Algerian city. (Bennia et al., 2025)

5. Methodology

5.1 Research Design

This study adopts a quantitative descriptive research design. The aim of this design is to investigate and describe how Baccalaureate students use the ELMED platform and to analyze their perceptions regarding its educational impact. The quantitative approach was chosen because it allows the collection of measurable data that can be analyzed statistically to identify patterns of use, benefits, and challenges.

5.2 Research Setting

The study was conducted in Bechar, Algeria, a southern region where students prepare for the national Baccalaureate examination under similar educational conditions as other regions in the country. The focus on this setting provides insight into digital learning practices in a semi-urban educational context where access to technology may vary among learners.

5.3 Participants

The sample consisted of 90 Baccalaureate students selected from different secondary schools in Bechar. The participants were chosen to represent both male and female students preparing for the final examination.

5.4 Research Instrument

Data were collected using a structured questionnaire, which is considered an effective tool for gathering standardized information from a large group of respondents. The questionnaire was divided into three main sections:

Section 1: Personal Information: this section included demographic variables such as Gender, age and academic stream (Science, Literature, etc.)

Section 2: Patterns of Use

This section focused on how students interact with the ELMED platform, including:

- Frequency of use (daily, weekly, rarely)
- Type of materials accessed (videos, summaries, exercises)
- Purpose of use (revision, homework support, exam preparation)

Section 3: Perceptions and Challenges

This section explored students' opinions regarding:

- Perceived usefulness of the platform
- Impact on learning and understanding
- Level of motivation
- Difficulties encountered (internet access, technical issues, concentration problems)

Most items in the questionnaire were designed using a close-ended format (multiple choice and Likert-scale items) to facilitate statistical analysis.

5.5 Validity and Reliability

To ensure the validity of the instrument, the questionnaire was reviewed by experts in educational sciences to confirm clarity, relevance, and alignment with the research objectives. Minor modifications were made based on their feedback. Although formal statistical reliability testing was limited, the internal consistency of the questionnaire was ensured through clear and structured item design.

5.6 Data Collection Procedure

The questionnaire was distributed directly to students in selected secondary schools in Bechar. Participants were informed about the purpose of the study and assured that their responses would remain confidential and used solely for academic research purposes. Students completed the questionnaire individually within a supervised setting to ensure accuracy and reduce external influence.

5.7 Data Analysis

The collected data were analyzed using descriptive statistical methods, including frequencies and percentages. The results were then presented in tables to facilitate interpretation and discussion.

6. Findings and Results

Table 1: Demographic Characteristics of Participants

Variable	Category	Number of Students	Percentage
Gender	Male	40	44.4%
	Female	50	55.6%
Total		90	100%
Age	17 years	22	24.4%
	18 years	48	53.3%
	19 years	15	16.7%
	20 years	5	5.6%
Total		90	100%
Academic Stream	Science	42	46.7%
	Literature & Philosophy	28	31.1%
	Mathematics	12	13.3%
	Technical / Other Streams	8	8.9%
Total		90	100%

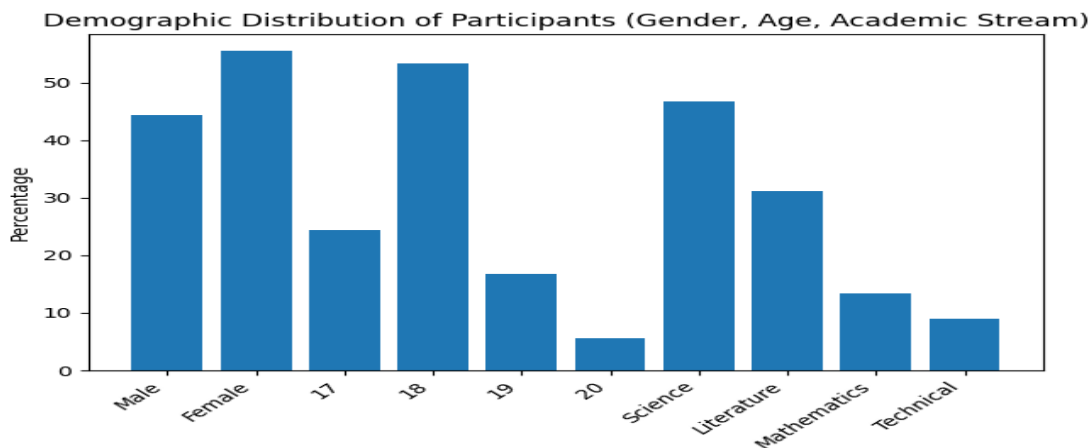


Figure1: demographic Distribution of Participants

The demographic participant's Profile shows a relatively balanced gender distribution, with a slightly higher proportion of female students (55.6%) compared to male students (44.4%). This reflects the typical composition of Baccalaureate classes in many Algerian secondary schools. Regarding age distribution, the majority of students are 18 years old (53.3%), which corresponds to the standard age for final-year secondary education in Algeria. Students aged 17 represent 24.4%, indicating early advancement or younger enrollment, while a smaller proportion of students are aged 19 and 20 (22.3% combined), reflecting delayed schooling or repetition of academic years.

The demographic data indicate a diverse sample in terms of academic specialization. Nearly half of the participants (46.7%) are enrolled in the Science stream, reflecting the strong presence of scientific tracks in Baccalaureate education. Students from Literature and Philosophy represent 31.1%, while Mathematics students account for 13.3%. A smaller proportion (8.9%) belongs to technical or other specialized streams. This distribution is significant because academic stream can influence students' learning strategies and their reliance on digital platforms. Science students, for example, may use ELMED more frequently for problem-solving exercises and structured revision, while Literature students may focus more on summaries and explanatory content. Therefore, the inclusion of multiple academic streams strengthens the validity and generalizability of the study findings. Overall, the sample is demographically appropriate for analyzing Baccalaureate students' engagement with digital learning platforms such as ELMED.

6.2 Frequency of Use of the ELMED Platform

Table 2: Frequency of ELMED Platform Use

Frequency of Use	Number of Students	Percentage
Daily	43	47.8%
Several times per week	29	32.2%
Rarely	18	20.0%
Total	90	100%

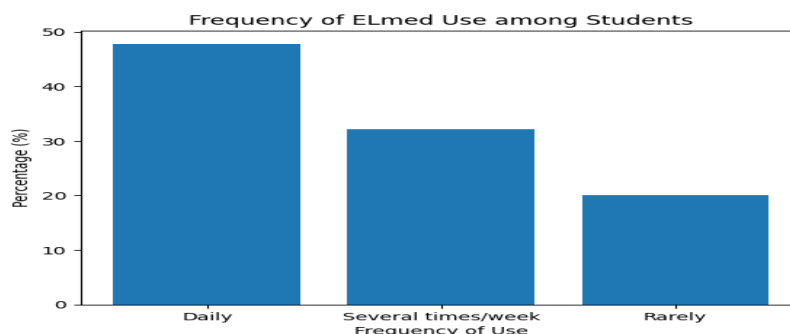


Figure 2: Frequency of ELMED use among Students

The results indicate a high level of engagement with the ELMED platform, as nearly half of the respondents (47.8%) reported using it daily. This suggests that the platform has become an integral part of students' academic routine, particularly in the context of Baccalaureate exam preparation. Additionally, 32.2% of students use the platform several times per week, which further confirms its regular integration into learning practices. Only a minority (20%) reported infrequent use, indicating that limited engagement is not widespread. Overall, these findings reflect a strong dependence on digital learning tools for revision and academic support.

6.3. Purpose of Using the ELMED Platform

Table 3: Main Purposes of Use

Purpose of Use	Number of Students	Percentage
Exam preparation	52	57.8%
Understanding lessons	24	26.7%
Homework support	14	15.5%
Total	90	100%

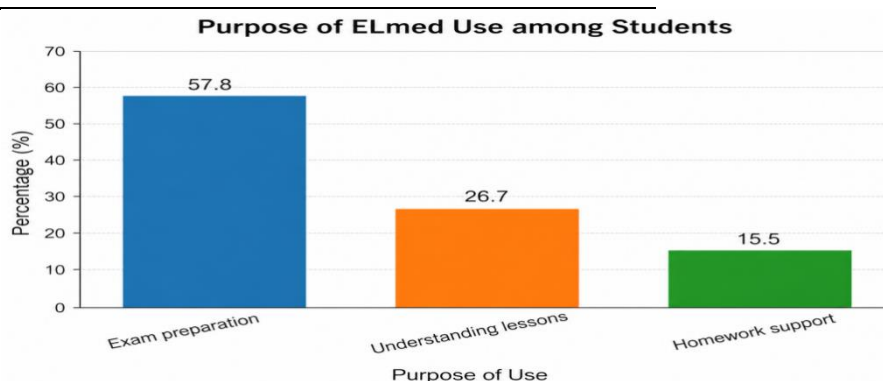


Figure 3: Purpose of ELMED Use

The data reveal that the primary motivation for using the ELMED platform is exam preparation, reported by 57.8% of students. This highlights the instrumental role of the platform in supporting high-stakes academic performance; a significant proportion (26.7%)

uses it to better understand classroom lessons, indicating its complementary function in reinforcing school-based learning. A smaller percentage (15.5%) relies on it for homework support. These results demonstrate that ELMED is predominantly perceived as an exam-oriented learning tool rather than a general educational platform

6.4 Perceived Academic Benefits

Table 4: Perceived Benefits of ELMED

Benefit	Number of Students	Percentage
Improved understanding	46	51.1%
Access to resources	27	30.0%
Time flexibility	17	18.9%
Total	90	100%

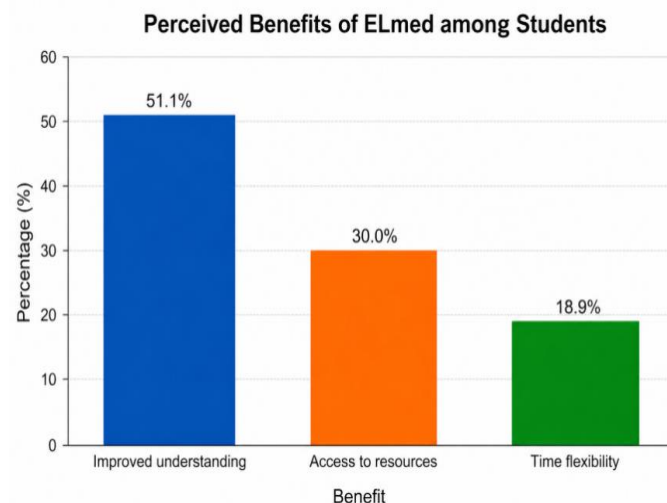


Figure 4: Perceived Benefits of ELMED

More than half of the respondents (51.1%) reported improved understanding of academic content as the main benefit of using ELMED. This suggests that the platform effectively supports cognitive comprehension through structured and accessible materials. Additionally, 30% of students emphasized the importance of easy access to learning resources, while 18.9% highlighted flexibility in study time. These findings confirm that digital learning environments contribute not only to knowledge acquisition but also to more adaptable learning experiences.

6.5 Challenges Faced by Students

Table 5: Difficulties Encountered

Challenge	Number of Students	Percentage
Internet connectivity	41	45.6%
Lack of motivation	28	31.1%
Technical issues	21	23.3%
Total	90	100%

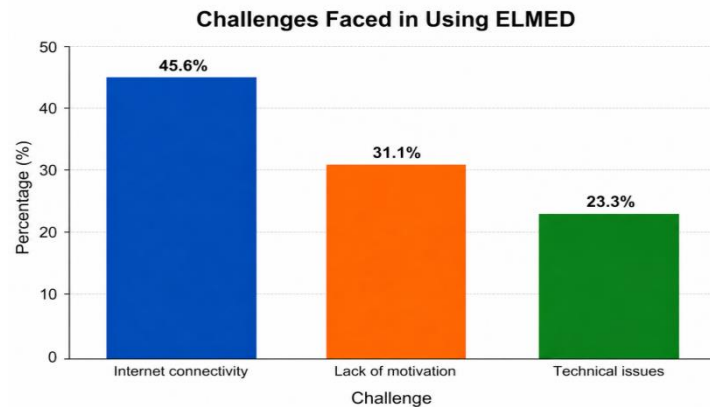


Figure 5: Challenges faced in Using ELMED

The most significant challenge reported is unstable or limited internet connectivity (45.6%), which remains a major barrier to effective digital learning in many contexts. Furthermore, 31.1% of students indicated a lack of motivation, suggesting that self-regulated learning requires stronger psychological engagement. Technical difficulties were reported by 23.3% of respondents, reflecting occasional usability or access issues. These findings highlight that despite its benefits, the effectiveness of ELMED is influenced by infrastructural and motivational constraints.

6.6 Overall Perception of ELMED

Table 6: General Perception

Perception Level	Number of Students	Percentage
Very useful	38	42.2%
Useful	36	40.0%
Moderately useful	16	17.8%
Not useful	0	0%
Total	90	100%

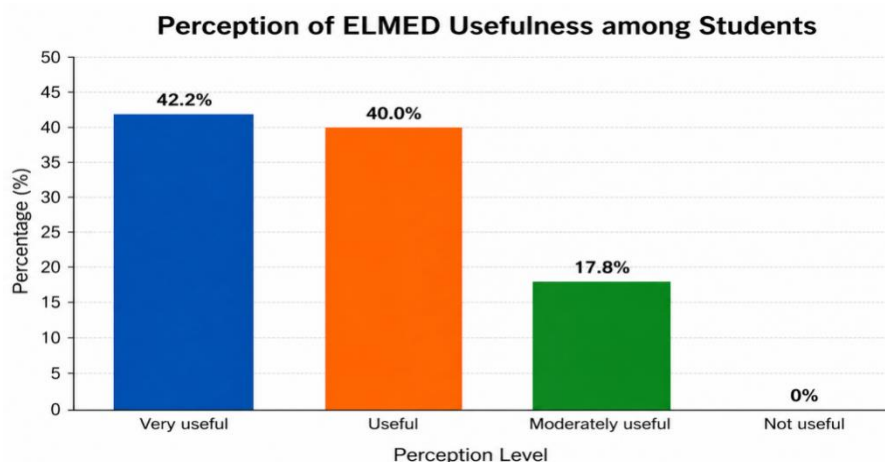


Figure 6: Perception O ELMED usefulness among Students

The overall perception of the ELMED platform is highly positive, with 82.2% of students describing it as useful or very useful. This reflects a strong acceptance of digital learning tools among Baccalaureate candidates. The absence of negative responses indicates that the platform is generally well-received. However, the presence of 17.8% who consider it only moderately useful suggests that improvements in content delivery and accessibility could further enhance user satisfaction.

7. Discussion

This section interprets and discusses the main findings of the study in relation to the research objectives, the hypotheses, and relevant literature on digital learning and educational platforms, particularly in the context of ELMED use among Baccalaureate students in Bechar, Algeria.

7.1 General Perception of the ELMED Platform

The results indicate that students generally hold a positive perception of the ELMED platform. A large proportion of respondents considered it either *very useful* or *useful*, while only a small minority rated it as moderately useful, and none considered it not useful. This suggests that ELMED is largely accepted as a supportive educational tool in the preparation for the Baccalaureate examination.

This positive perception can be interpreted in light of digital learning theories which emphasize that learners tend to value platforms that provide accessibility, exam-oriented content, and autonomy in learning. In the case of ELMED, its alignment with curriculum requirements and exam preparation appears to increase its perceived relevance among students. This supports the idea that digital platforms are more effective when they are closely integrated with learners' immediate academic needs.

7.2 Purposes of Use and Learning Motivation

The findings show that the primary purpose of using ELMED is exam preparation, followed by understanding lessons and homework support. This dominant focus on examination preparation reflects the strong exam-oriented culture in Algerian secondary education, where success in the Baccalaureate is a decisive academic milestone. From a pedagogical perspective, this result indicates that students are mainly driven by extrinsic motivation, particularly the need to achieve high exam scores.

However, the presence of a considerable percentage using the platform to understand lessons also reflects an emerging shift toward self-directed learning, where students use digital resources to clarify and reinforce classroom instruction. This dual function exam preparation and conceptual understanding shows that ELMED is not only a revision tool but also a supplementary learning environment that extends classroom teaching.

7.3. Challenges Faced by Students

Despite the positive attitudes, the study reveals several challenges affecting the effective use of the platform. The most significant difficulty reported is internet connectivity issues, followed by lack of motivation and technical problems. The predominance of internet-related issues highlights a key infrastructural limitation in digital learning implementation. Even if platforms like ELMED are well designed, their effectiveness remains dependent on stable internet access, which may not always be consistent for all students in Bechar.

The issue of lack of motivation is equally important from a pedagogical perspective. It suggests that simply providing digital tools is not sufficient; students also require guidance, engagement strategies, and teacher support to maintain consistent usage. Technical problems, although less frequent, still indicate the need for better digital literacy and institutional support.

7.4. Educational Value and Effectiveness

The overall evaluation of ELMED shows that students perceive it as a highly valuable educational resource; the combination of “very useful” and “useful” responses indicates that the platform contributes positively to learning outcomes, particularly in exam preparation. This finding supports the hypothesis that digital platforms enhance learning when they are integrated into students’ academic routines. ELMED appears to function as a complementary learning tool, reinforcing classroom instruction rather than replacing it. However, the moderate percentage of students who rated it as only “moderately useful” suggests that the platform’s effectiveness may vary depending on individual learning styles, digital skills, and access conditions.

7.5. Relation to Hypotheses

Based on the results, the study’s assumptions can be interpreted as follows:

- The hypothesis that ELMED improves students’ preparation for the Baccalaureate is largely supported, given the strong focus on exam preparation and positive evaluation.
- The hypothesis that students face challenges in using the platform is also confirmed, particularly due to internet access and motivation issues.
- The idea that digital learning enhances understanding of lessons is partially supported, as a significant group of students reported using ELMED for comprehension, though this is secondary to exam preparation.

The findings are consistent with broader research on digital learning platforms, which often highlight that students tend to prioritize exam-oriented use of online resources. Many studies also emphasize that while digital platforms improve access to learning materials; their effectiveness is often constrained by technological infrastructure and learner engagement levels. In this sense, the results from Bechar reflect a common pattern in developing educational contexts, where digital transformation is progressing but still faces structural and motivational limitations.

In general, the discussion reveals that ELMED plays a significant and positive role in supporting Baccalaureate students in Bechar. It is primarily used as an exam preparation tool, but it also contributes to understanding lessons and supporting homework completion. However, its full potential is partially limited by external factors such as internet access and internal factors such as student motivation. This duality suggests that while digital platforms are becoming essential in modern education, their effectiveness depends not only on their design but also on infrastructure, pedagogical integration, and student engagement strategies.

8. Conclusion

This study set out to investigate the use of the ELMED platform in preparing Baccalaureate students in Bechar, Algeria, within the broader context of learning and teaching in the digital age. The findings provide a clear picture of how students perceive, use, and

experience this digital learning tool, as well as the challenges they encounter. Overall, the results show that ELMED is widely accepted and positively perceived by students. A large majority consider it either very useful or useful, which reflects its relevance as a supportive educational resource in Baccalaureate preparation. The platform is mainly used for exam preparation, which highlights the strong examination-oriented nature of the Algerian educational system, while a smaller proportion of students also use it to understand lessons and support homework completion.

However, despite this positive evaluation, the study also reveals important limitations and challenges. The most significant obstacle is poor internet connectivity, followed by lack of motivation and technical difficulties. These challenges indicate that the effectiveness of digital learning platforms is not determined only by their educational content, but also by external factors such as infrastructure and students' engagement levels. In light of these findings, it can be concluded that ELMED plays a meaningful but partially constrained role in supporting students' learning process. It contributes positively to academic preparation, especially for examinations, but its full potential is not yet fully realized due to technical and motivational barriers.

Finally, this study confirms that digital platforms like ELMED are becoming essential tools in modern education. However, their success depends on improving internet accessibility, enhancing digital literacy, and integrating such platforms more effectively into classroom teaching practices. Strengthening these aspects would allow students to benefit more fully from digital learning opportunities and improve overall educational outcomes.

9. Recommendations

In light of the findings of this study, several recommendations can be formulated to enhance the effectiveness of the **ELMED platform** and improve students' digital learning experience in preparing for the Baccalaureate examination in Bechar, Algeria:

- Improve internet connectivity and digital infrastructure to ensure equal access to the ELMED platform.
- Enhance the platform's technical performance and user support to reduce technical difficulties.
- Integrate ELMED more systematically into classroom teaching and assignments.
- Increase student motivation through interactive activities and digital engagement strategies.
- Provide training to develop students' and teachers' digital literacy skills.
- Encourage a more balanced use of ELMED beyond exam preparation only, including lesson understanding and continuous learning.

Implementing these recommendations would significantly enhance the pedagogical impact of the ELMED platform and contribute to a more effective integration of digital learning tools within the Algerian secondary education system.

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