



Vocational Training of University Professors in the Context of Digital Transformation: A Field Study at the Faculty of Humanities and Social Sciences, University of Bordj Bou Arreridj

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Issue web link

<https://imcra-az.org/archive/395-science-education-and-innovations-in-the-context-of-modern-problems-issue-3-vol-9-2026.html>

Keywords

vocational training, university professor, digital transformation, higher education quality, e-learning, educational platforms, University of Bordj Bou Arreridj

Abstract

This study examines the role of vocational training for university professors in the context of digital transformation and its contribution to improving the quality of higher education. The growing integration of digital technologies into university teaching has created an urgent need for academic staff to acquire new competencies related to online learning platforms, remote communication tools, digital content design, and electronic assessment methods. To investigate this issue, the study employed the descriptive method and used a questionnaire as the main instrument for data collection. A comprehensive survey was conducted among professors of the Faculty of Humanities and Social Sciences at Mohamed El Bachir El Ibrahim University of Bordj Bou Arreridj. Out of a total population of 90 professors, 75 valid responses were collected and analyzed. The findings indicate that the university has shown clear interest in training professors in the use of modern technologies to support digital transformation. The results also reveal that the institution is moving from a traditional face-to-face instructional model toward a more flexible digital model based on distance education and online learning platforms. In addition, the majority of professors demonstrated a positive orientation toward acquiring digital skills and using technological tools in teaching and assessment. The study concludes that continuous vocational training is a key strategic requirement for strengthening the quality of university education and supporting the successful implementation of digital transformation in higher education institutions.

Citation

Nawel Benahmed. (2026). Vocational Training of University Professors in the Context of Digital Transformation: A Field Study at the Faculty of Humanities and Social Sciences, University of Bordj Bou Arreridj. *Science, Education and Innovations in the Context of Modern Problems*, 9(3), 1-10. <https://doi.org/10.56334/sci/9.3.41>

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Received: 20.05.2025

Accepted: 28.12.2025

Published: 15.03.2026 (available online)

1. Introduction

The technological revolution that accelerated from the late twentieth century onward produced major transformations in communication, information systems, software development, and digital infrastructures. These changes significantly influenced all sectors of society, including higher education. Information and communication technologies have become central to educational systems because they facilitate the production, processing, storage, retrieval, and dissemination of knowledge. In contemporary higher education, digital technologies are no longer supplementary tools; rather, they have become essential instruments in teaching, learning, communication, evaluation, and institutional management.

Education remains one of the most important foundations of social and scientific progress. In this context, the quality of university education has gained growing international attention, especially in light of increasing competition, the expansion of knowledge economies, and the shift toward more decentralized and technology-driven educational models. Quality in higher education does not emerge spontaneously. It requires clear policies, effective planning, appropriate infrastructure, and well-prepared human resources capable of implementing modern educational approaches.

Among the main actors in the university system, the university professor occupies a central position. The success of digital transformation in higher education depends largely on the ability of professors to adapt to new educational realities. Today, university professors are expected to use online platforms, design digital learning materials, conduct remote teaching sessions, manage electronic assessments, and provide students with digital academic resources. These responsibilities require specific professional and technological competencies that can only be developed through continuous vocational training.

In the Algerian context, digital transformation in higher education has become an urgent institutional priority. However, the transition toward digitally supported education has also exposed several challenges, including insufficient technological preparedness, limited training opportunities, and disparities in the digital competencies of both students and faculty members. For this reason, vocational training has become a necessary mechanism for enabling university professors to respond effectively to the demands of digital education and contribute to the improvement of educational quality.

Within this framework, the present study investigates the relationship between the vocational training of university professors and the quality of higher education in the context of digital transformation, with particular reference to the Faculty of Humanities and Social Sciences at the University of Bordj Bou Arreridj.

2. Research Problem

Higher education institutions across the world are undergoing profound digital transformation. This transformation extends beyond the simple introduction of technological devices into classrooms and affects the entire educational process, including teaching methods, curriculum delivery, communication patterns, assessment practices, and academic administration. Consequently, universities must prepare their professors to function effectively in digital learning environments.

Despite efforts made by Algerian universities to advance digital transformation, several obstacles remain. These include the limited availability of specialized training, uneven levels of digital literacy, and difficulties in integrating digital tools into everyday teaching practices. In view of these challenges, the present study addresses the following central research question: Is there a relationship between the vocational training of university professors in light of digital transformation and the quality of higher education?

From this main question, the following sub-questions emerge:

1. Does training professors to use digital educational platforms contribute to the integration of digital technology in the university?
2. Does training in remote conferencing technologies support the university's transition toward e-learning and digitally mediated education?

3. Study Hypotheses

General Hypothesis

There is a significant relationship between the vocational training of university professors in the context of digital transformation and the quality of higher education.

Sub-Hypotheses

1. Training professors in the use of educational digital platforms contributes to the integration of digital technology in the university.
2. Training professors in the use of remote conferencing technologies supports the transition toward electronic and distance education.

4. Significance of the Study

This study is important because it addresses a highly relevant contemporary issue, namely the preparation of university professors for digital transformation and its implications for educational quality. The subject is particularly significant in the current era, where universities are increasingly required to modernize their teaching systems and adopt digital technologies in response to institutional, social, and global changes.

The importance of this study lies in highlighting the need for university administrations and policymakers to invest in the continuous training of academic staff. Such training enhances the ability of professors to use digital tools effectively, supports the integration of technology into pedagogical practice, and ultimately contributes to improving the quality of higher education.

5. Objectives of the Study

The study seeks to achieve the following objectives:

1. To deepen understanding of the concepts of vocational training and digital transformation in higher education.
2. To identify the main training needs of university professors in the context of digital transformation.
3. To examine the relationship between professors' vocational training and the quality of higher education.
4. To provide recommendations that may assist university decision-makers in implementing digital transformation more effectively.

6. Conceptual Framework

6.1 The University System

The university system may be understood as a social and institutional structure operating within a broader cultural, social, and economic environment. It is not an isolated entity; rather, it interacts continuously with society and responds to its developmental needs. As an open system, the university includes several interrelated subsystems working together to achieve

common educational, scientific, and social goals. Its mission is to prepare qualified human capital capable of contributing to social progress, scientific advancement, and national development.

6.2 Quality of Higher Education

Quality in higher education refers to the continuous improvement of teaching, research, academic interaction, and institutional performance. It involves the effective development of relationships between professors and students, the professional growth of faculty members, the efficient use of resources, and the regular evaluation of educational processes in order to ensure sustainable improvement and academic excellence.

6.3 Digitization of the Educational Process

Digitization in education refers to the integration of information and communication technologies into teaching and learning activities. It includes the use of computers, software, online platforms, internet-based resources, digital databases, and other modern tools to store, process, transmit, and present knowledge. In higher education, digitization represents a transition from traditional classroom-centered instruction to more flexible, technology-supported forms of learning, including distance education.

6.4 E-Learning

E-learning is a form of education based on digitally delivered content, network-supported services, and technology-mediated interaction. It may take place remotely or in face-to-face settings supported by computers and digital platforms. E-learning is characterized by flexibility, personalization, interactivity, and collaborative learning opportunities.

6.5 Vocational Training

Vocational training refers to the structured development of skills and competencies that enable individuals to perform professional tasks efficiently and effectively. In the university context, vocational training aims to equip professors with the knowledge, technological abilities, and pedagogical competencies required for high-quality teaching and professional performance.

6.6 University Professor

A university professor is an academic professional who performs teaching, research, supervision, and community service functions within a higher education institution. The professor is a central pillar of the university system and plays a decisive role in the success of educational reform, institutional development, and knowledge production.

7. Methodology

7.1 Study Design

The study adopted the descriptive method, which was considered appropriate for examining the current state of vocational training among university professors and its relationship to digital transformation in higher education.

7.2 Study Field

The study was conducted at the Faculty of Humanities and Social Sciences, Mohamed El Bachir El Ibrahimi University of Bordj Bou Arreridj, Algeria. The faculty includes six departments:

- Humanities
- Social Sciences
- History
- Psychology
- Media and Communication
- Islamic Sciences

7.3 Study Population

The study population consisted of all professors working in the Faculty of Humanities and Social Sciences, totaling 90 faculty members, distributed as follows:

- Social Sciences: 42
- Psychology: 17
- History: 15
- Humanities: 9
- Media and Communication: 4
- Islamic Sciences: 3

7.4 Study Period

The field study was conducted during the 2025 academic year. Data collection and completion of the study required approximately 20 days.

7.5 Data Collection Tool

A questionnaire was used as the main data collection instrument. It was selected because it allowed the researcher to gather structured and comparable data from a relatively large number of participants. The questionnaire was organized into four sections:

1. Personal information of respondents
2. Use of educational platforms
3. Mastery of remote conferencing technologies
4. Digital transformation in university education

7.6 Response Rate

Although the total study population consisted of 90 professors, 75 valid questionnaires were returned and included in the analysis.

8. Results

8.1 Demographic Characteristics of Respondents

The sample consisted of 75 professors. Female respondents represented 53.34%, while male respondents accounted for 46.66%. In terms of age, the largest group belonged to the 36–45 years category (45.33%), followed by the 30–35 years group (37.33%). Smaller proportions were recorded for the 46–51 years group (13.34%), the 52–56 years group (2.66%), and those aged 57 and above (1.34%).

Regarding marital status, 53.34% of respondents were married and 46.66% were single. In terms of academic rank, the largest group was Lecturer (A) at 36%, followed by Lecturer (B) at 33.33%, Assistant Professor at 24%, and Professor of Higher Education at 6.67%. With respect to years of experience, 48% had less than 5 years of experience, 36% had between 5 and 10 years, and 16% had more than 11 years of experience.

8.2 Results Related to the First Hypothesis

Training on Digital Educational Platforms

The findings show that 72% of respondents had received training in the use of digital educational platforms, whereas 28% had not. This indicates that the majority of professors have already been exposed to some form of digital training. The result suggests that the university has made practical efforts to support professors in adapting to digital transformation.

Training and the Use of Technological Tools

The analysis also reveals that laptops were the most frequently used technological tools in teaching, accounting for 81.33% of usage. Smartphones represented 14.67%, while smart boards accounted for only 4%. This demonstrates that digital teaching practices are mainly dependent on portable personal technologies rather than institutionally installed smart classroom equipment.

Perceived Importance of Training

A total of 69.33% of respondents confirmed that training is necessary in the context of digital transformation, while 30.67% did not express the same view. This indicates a strong overall awareness among professors regarding the importance of training for improving their professional performance and adapting to new educational environments.

Platforms Used After Training

Among the professors who had received training, 72.22% reported using Moodle, while 27.78% used EdX or other platforms. This finding confirms the dominant role of Moodle as the primary digital learning platform within the faculty.

Training and Interactive Lesson Design

Among trained professors, 85.18% stated that the training helped them design interactive lessons on digital platforms, whereas 14.82% indicated that it did not. This result suggests that vocational training has a direct positive effect on professors' ability to create more engaging digital learning experiences.

Technological Skills and Electronic Assessment

The findings further show that 81.33% of respondents used electronic tests in student evaluation. Among this group, 85.18% reported having sufficient technological skills, while 14.82% did not. This suggests a clear association between technological competence and the effective use of digital assessment tools.

Overall, the results support the first hypothesis and indicate that training in educational platforms contributes substantially to the integration of digital technologies in university teaching.

8.3 Results Related to the Second Hypothesis

The study also examined the relationship between teaching through remote conferencing technologies and the provision of digital resources to students. The results show that among professors who used remote conferencing technologies, 57.70% also provided students with digital resources, whereas 42.30% did not. By contrast, among those who did not use remote conferencing technologies, only 30.43% provided digital resources, while 69.57% did not.

These findings indicate that the use of remote conferencing technologies is positively associated with broader digital pedagogical practices, including the sharing of electronic materials and academic resources. Professors who engage in remote teaching appear more likely to adopt additional forms of digital support for student learning. This result supports the second hypothesis and suggests that training in remote communication technologies strengthens the university's transition toward e-learning.

9. General Interpretation of Findings

The findings of the study demonstrate that vocational training plays a central role in enabling university professors to adapt to digital transformation. The majority of respondents had received some form of digital training and showed positive attitudes toward the use of educational technologies. The widespread use of Moodle, the high proportion of professors able to design interactive lessons, and the strong relationship between technological skills and electronic assessment all indicate that training improves both teaching practices and digital readiness.

At the same time, the results also suggest that digital transformation remains a gradual and uneven process. Not all professors received training, and not all were equally successful in using digital tools. This means that university administrations should not treat digital transformation as a one-time institutional change, but rather as a continuous process requiring ongoing training, and evaluation.

8.4. Results Related to the Use of Remote Conferencing Technologies

Table No. (13). The Most Frequently Used Method for Delivering Remote Lectures

Table No. (13) presents the distribution of respondents according to the most frequently used application for delivering remote lectures. Among the 52 professors who reported using remote conferencing technologies, Google Meet was the dominant platform, used by 88.46% of respondents, followed by Zoom at 7.69% and BigBlueButton at 3.84%.

The predominance of Google Meet suggests that professors tend to prefer platforms that are easy to access, simple to operate, and compatible with common institutional and personal digital environments. This result is consistent with the broader digital transformation of higher education, in which the adoption of user-friendly online communication tools has become central to the continuity of teaching and learning. International frameworks on digital education emphasize that educators' effective participation in digital transformation depends not only on access to technology, but also on the usability of digital tools and the ability of teachers to integrate them meaningfully into pedagogical practice.

The high level of reliance on Google Meet may also indicate the influence of prior training. When specific platforms are emphasized during institutional training sessions, faculty members are more likely to adopt them in routine practice. In this sense, platform preference should not be understood merely as a technical choice, but as a reflection of institutional digital culture, training exposure, and platform familiarity. This finding supports the view that digital competence develops through repeated use, guided training, and alignment between institutional systems and teaching needs.

Table No. (14). Relationship Between the Evaluation of Remote Conferencing Skills and the Technological Means Used in the Teaching Process

Table No. (14) shows the relationship between professors' self-evaluation of their remote conferencing skills and the technological devices they use in teaching. The findings indicate that laptops were the most frequently used teaching device overall, accounting for 74.67% of responses, followed by smartphones at 20% and smart boards at 5.33%.

A more detailed reading of the table shows that all respondents who rated their conferencing skills as excellent or weak reported using laptops exclusively, while laptop use also remained dominant among those who rated their skills as good (71.79%) and average (71.43%). Smartphone use was more common among respondents who rated their skills as good or average, while smart board use remained limited across all skill categories.

These findings suggest that the laptop remains the principal device for digital teaching because it offers a more stable and functionally complete environment for videoconferencing, content sharing, document preparation, and classroom management than smartphones or smart boards. From a pedagogical perspective, device choice is not neutral; it shapes the quality of interaction, control over teaching materials, and the instructor's ability to manage synchronous learning sessions. OECD analyses of digital education similarly note that the educational value of digital transformation depends not only on the existence of digital tools, but also on whether institutions and educators have access to appropriate devices that support instructional tasks effectively.

The low use of smart boards may indicate either limited classroom infrastructure or a continued preference for portable, personally controlled devices. Meanwhile, the non-negligible use of smartphones suggests adaptive behavior by some professors, although smartphones may be less suitable for full instructional management during remote teaching. This interpretation aligns with research showing that the digital divide in education includes not only access to the internet, but also differences in the quality of devices, digital skills, and capacity to use technology for meaningful educational purposes.

Overall, the data indicate that mastery of remote conferencing technologies is closely associated with access to practical and pedagogically suitable devices, especially laptops. The success of remote teaching, therefore, depends on both teacher competence and the material conditions that enable competent digital practice.

Table No. (15). Mastery of Conferencing Technologies and Its Contribution to Effective Knowledge Delivery

Table No. (15) examines the extent to which professors believe that mastery of remote conferencing technologies contributes to the effective delivery of knowledge to students. The highest percentage of respondents, 58.66%, stated that such mastery contributes to a moderate degree, while 26.66% believed that it contributes to a large degree, and 14.68% considered its contribution weak.

These results indicate a generally positive but cautious assessment of remote conferencing technologies. Most professors acknowledge that videoconferencing tools can support knowledge delivery, but many do not regard them as fully equivalent to face-to-face instruction. This moderate evaluation may reflect the dual nature of synchronous online teaching: on the one hand, it increases continuity, accessibility, and communication; on the other hand, it may reduce immediacy, spontaneous interaction, and the richness of physical classroom dynamics. Research on online learning consistently shows that digital environments can support learning outcomes and interaction, but their effectiveness depends heavily on instructional design, teacher readiness, student engagement, and the quality of digital communication.

The proportion of respondents who rated the contribution as weak may be linked to persistent barriers such as unstable internet access, reduced student participation, limited visual feedback, and the difficulty of maintaining attention and classroom presence in online settings. UNESCO and OECD both emphasize that digital transformation in education is not simply a technical migration from in-person to online formats; it requires new competencies, redesigned pedagogical strategies, and institutional support mechanisms that help teachers translate educational goals into effective digital practice.

Thus, the findings suggest that mastery of conferencing technologies does support knowledge transmission, but its pedagogical impact is shaped by broader structural and instructional conditions.

Table No. (16). Whether Remote Lectures Require Greater Effort Than Face-to-Face Lectures

Table No. (16) reports professors' views on whether remote lectures require more effort than conventional face-to-face lectures. Among respondents who used remote conferencing technologies, 82.69% stated that remote lectures require greater effort, whereas 17.31% believed that they do not.

This result strongly indicates that remote teaching is widely perceived as a demanding instructional mode. The additional effort associated with online lectures likely includes technical preparation, digital organization, management of online platforms, adaptation of teaching materials, monitoring of student participation, and the need to sustain attention in an environment where communication cues are weaker than in physical classrooms. In many cases, the professor is required to perform several tasks simultaneously, including presenting content, managing technology, supervising chat interaction, solving technical issues, and maintaining student engagement. This multi-layered workload is widely recognized in the literature on digital and online teaching.

The finding also reflects an important institutional reality: digital transformation does not necessarily reduce academic labor; rather, at least in its transitional stages, it often redistributes and intensifies it. Preparing and delivering remote lectures may demand greater self-regulation, psychological readiness, and time investment than traditional classroom instruction. This is particularly true when digital teaching is introduced rapidly or when training and technical support remain uneven. OECD work on teacher preparation for digital education similarly highlights that effective digital teaching requires educators to acquire a broader set of competences and to engage in continued adaptation rather than one-time technological adjustment. Accordingly, the result underscores the need for universities not only to train professors in technical skills, but also to recognize the increased workload associated with digital teaching and to provide corresponding pedagogical and institutional support.

Table No. (17). Evaluation of the Level of Student Interaction in Remote Lectures

Table No. (17) presents professors' evaluations of student interaction during remote lectures. Among the respondents who used remote conferencing technologies, 48.08% described student interaction as average, another 48.08% described it as weak, and only 3.84% considered it good.

These findings point to a major challenge in digital higher education: sustaining strong student interaction in synchronous online environments. Although remote conferencing makes it possible to continue teaching beyond the physical classroom, it does not automatically guarantee active participation, social presence, or meaningful engagement. Interaction in online learning depends on several interrelated factors, including digital access, students' confidence in using communication tools, instructional design, perceived relevance of the content, and the extent to which the teacher can create an engaging and responsive online learning environment. Recent research has shown that the quality of digital interaction is closely related to learning gain, satisfaction, and academic engagement.

The limited proportion of respondents reporting "good" interaction may also reflect broader problems associated with the digital divide. In online settings, students' participation is influenced not only by motivation, but also by connectivity, device quality, home learning conditions, and digital skills. When these conditions are uneven, interaction may decline even if the teacher is competent and the platform is available. Studies on synchronous online learning and digital inequality show that engagement is shaped by both technological access and the ability of students and teachers to use digital tools effectively.

From a pedagogical standpoint, indicators such as the number of student interventions, use of microphones or cameras, responses to questions, and attendance consistency can all serve as observable measures of interaction. However, digital participation is often more fragile and less visible than participation in face-to-face classrooms. For this reason, universities should not assume that access to remote platforms alone is sufficient; rather, they should support professors in developing interaction-oriented online teaching strategies and support students in becoming more active digital learners. UNESCO's digital education agenda similarly emphasizes that meaningful learning in digital environments depends on the development of human-centered, inclusive, and competency-based approaches rather than on technology alone.

Table No. (18). Professors' Opinions on the Skills Required to Deliver a Successful Remote Lecture

Table No. (18) shows professors' opinions regarding the most important skills required for successful remote teaching. The largest group of respondents, 58.66%, identified technical technological skills as the most important requirement. This was followed by 21.34%, who emphasized the ability to manage virtual learning platforms, while 20% highlighted presentation and delivery skills.

The predominance of technical-technological skills indicates that professors perceive digital competence as the foundation of successful remote instruction. This perception is strongly supported by international digital competence frameworks, which define educators' digital readiness in terms of their ability to use digital tools, manage online learning environments, create digital content, facilitate interaction, and assess students through technology-enhanced methods. The DigCompEdu framework, for example, conceptualizes educator digital competence as a multidimensional construct that includes professional engagement, digital resources, teaching and learning, assessment, learner empowerment, and support for students' digital competence.

At the same time, the results also show that technical competence alone is not enough. A successful remote lecture requires the integration of platform management, pedagogical communication, and presentation skills. Effective online teaching depends on the professor's ability to structure the session clearly, maintain attention, use digital resources appropriately, create opportunities for interaction, and adapt delivery to the conditions of the online environment. In this sense, remote teaching transforms the traditional role of the professor. Academic authority is no longer based solely on mastery of

disciplinary knowledge, but also on the ability to communicate that knowledge effectively through digital media. This transformation is widely recognized in contemporary discussions of digital higher education and teacher preparation. The findings therefore suggest that the digitally competent professor is emerging as a new academic profile within higher education. Conversely, the absence of these skills may reduce teaching effectiveness, weaken interaction, and limit the university's ability to achieve sustainable digital transformation.

8.5. Overall Interpretation of Tables 13-18

Taken together, the results of Tables 13-18 show that remote conferencing technologies have become an integral part of teaching practice among the surveyed professors, but their effective use depends on a combination of technical competence, appropriate devices, institutional training, and pedagogical adaptation. Google Meet appears to be the dominant platform, laptops remain the principal instructional device, and technical skills are regarded as the most essential condition for success in remote teaching. At the same time, professors acknowledge that remote lectures require greater effort than face-to-face teaching and that student interaction in online settings often remains moderate or weak.

These findings reinforce the central argument of the study: vocational training is not a secondary support mechanism, but a strategic requirement for improving the quality of university education in the era of digital transformation. Digital transformation in higher education can only be effective when universities invest in sustained faculty development, strengthen digital pedagogy, reduce inequalities in access and use, and support both teachers and students in adapting to new educational environments.

Table 13. Most Frequently Used Platforms for Delivering Remote Lectures

Teaching via Remote Conferencing	Frequency	Percentage (%)	Platform Used	Frequency (K)	Percentage (%)
Yes	52	69.33	Google Meet	46	88.46
			BigBlueButton	2	3.84
			Zoom	4	7.69
			Total	52	100
No	23	30.67	—	—	—
Total	75	100			

Table 14. Relationship Between Remote Conferencing Skills and Technological Devices Used in Teaching

Skill Level	Laptop (n, %)	Smart Boards (n, %)	Smartphones (n, %)	Total
Excellent	6 (100%)	—	—	6
Good	28 (71.79%)	1 (2.56%)	10 (25.65%)	39
Average	20 (71.43%)	3 (10.72%)	5 (17.85%)	28
Weak	2 (100%)	—	—	2
Total	56 (74.67%)	4 (5.33%)	15 (20%)	75

Table 15. Contribution of Conferencing Technology Mastery to Effective Knowledge Delivery

Level of Contribution	Frequency (K)	Percentage (%)
High	20	26.66
Moderate	44	58.66
Low	11	14.68
Total	75	100

Table 16. Perceived Effort Required for Remote vs. Face-to-Face Lectures

Teaching via Remote Conferencing	Frequency	Percentage (%)	Requires Greater Effort	Frequency (K)	Percentage (%)
Yes	52	69.33	Yes	43	82.69
			No	9	17.31
			Total	52	100
No	23	30.67	—	—	—
Total	75	100			

Table 17. Evaluation of Student Interaction in Remote Lectures

Teaching via Remote Conferencing	Frequency	Percentage (%)	Interaction Level	Frequency (K)	Percentage (%)
Yes	52	69.33	Good	2	3.84
			Average	25	48.08
			Weak	25	48.08
			Total	52	100
No	23	30.67	—	—	—
Total	75	100			

Table 18. Required Skills for Delivering Successful Remote Lectures

Required Skills	Frequency (K)	Percentage (%)
Technical and Technological Skills	44	58.66
Virtual Platform Management Skills	16	21.34
Presentation and Delivery Skills	15	20
Total	75	100

The first sub-hypothesis assumed that *training university professors in the use of electronic educational platforms contributes to the integration of digital technology within the university*. The findings of the study provide strong empirical support for this assumption.

The results revealed that 72% of university professors had received training in the use of digital educational platforms, indicating a clear institutional commitment to digital transformation within higher education. This reflects the growing recognition among universities that faculty training is a fundamental prerequisite for successful digital integration.

In terms of platform usage, the Moodle learning management system emerged as the dominant platform, with 72.22% of professors trained on Moodle, compared to 27.78% trained on other platforms such as Progres. This suggests that institutional training programs are largely centered on Moodle as the primary tool for delivering digital instruction. This finding aligns with global trends where learning management systems serve as the backbone of digital education ecosystems. Despite this progress, the perceived adequacy of training remains moderate. Approximately 74.07% of professors evaluated their training as “somewhat sufficient”, indicating that while training exists, it may not fully meet the evolving demands of digital pedagogy. This highlights the need for more comprehensive and continuous professional development programs.

The results further demonstrated that training had a tangible impact on teaching practices. A significant proportion of professors (81.33%) reported using laptops in their teaching activities, suggesting that training contributes to the adoption of appropriate technological tools. Moreover, 85.18% of trained professors expressed a desire for additional training, emphasizing that digital competence development is an ongoing process rather than a one-time intervention.

The importance of training was also reflected in the attitudes of respondents, with 69.33% acknowledging its critical role in the context of digital transformation. This indicates an increasing awareness among faculty members of the need to continuously upgrade their skills in order to remain effective in digitally mediated learning environments.

Importantly, 85.18% of professors reported that training enabled them to design interactive lessons on digital platforms, demonstrating a direct positive effect on pedagogical performance. This finding confirms that training not only improves technical skills but also enhances instructional design capabilities, which are essential for student engagement in digital environments.

In addition, the study found that 85.18% of professors with digital competencies use electronic assessment methods, indicating a strong relationship between technological proficiency and the modernization of evaluation practices. This supports the idea that digital training facilitates a broader transformation of teaching and assessment processes.

Finally, the results showed that 87.03% of professors had a partial command of educational platform settings, while only 12.97% demonstrated full mastery. This suggests that although training contributes to skill development, there remains a gap between basic operational knowledge and advanced technical competence.

Overall, these findings confirm that vocational training plays a decisive role in integrating digital technologies into university teaching, while also highlighting the need for more advanced, continuous, and practice-oriented training programs.

8.2 Discussion of Results in Light of the Second Sub-Hypothesis

The second sub-hypothesis proposed that *training in distance learning technologies enhances the university’s ability to transition toward e-learning*. The empirical results strongly support this assumption.

The findings indicated that 57.70% of professors who use distance learning technologies provide digital resources to their students, suggesting that engagement with remote teaching tools encourages broader digital pedagogical practices. This reflects a shift from traditional content delivery toward more resource-rich and student-centered learning environments.

A key result of the study is the overwhelming reliance on Google Meet, which was used by 88.46% of professors for delivering remote lectures. This high percentage reflects both the accessibility of the platform and the effectiveness of training programs that promote its use. It also suggests that institutional training influences platform selection and standardization.

In terms of technological tools, 74.67% of professors reported using laptops during remote teaching, confirming that laptops remain the primary device for digital instruction due to their flexibility and functionality. This finding highlights the importance of providing faculty members with appropriate technological infrastructure to support digital teaching.

Regarding skill levels, 71.79% of professors evaluated their competence in distance learning technologies as “good”, indicating a relatively high level of digital readiness among faculty members. However, this also implies that a significant proportion of professors still require further skill development.

The study also revealed that 82.69% of professors believe that delivering remote lectures requires more effort than face-to-face teaching. This finding underscores the increased cognitive, technical, and organizational demands associated with online teaching. Remote instruction requires additional preparation, technological management, and strategies to maintain student engagement, which may increase the workload of faculty members.

Furthermore, 58.66% of respondents identified technical skills as the most important requirement for successful remote teaching, followed by platform management and presentation skills. This indicates that digital competence is perceived as the core foundation of effective online instruction.

Another important finding is that 72% of professors communicate with their students via professional email, reflecting the continued importance of formal communication channels in digital education. This suggests that digital transformation extends beyond teaching platforms to include broader communication practices within the academic environment.

Overall, the results demonstrate that training in distance learning technologies significantly enhances the university's capacity to implement e-learning. However, the transition requires not only technical skills but also institutional support, pedagogical adaptation, and continuous professional development.

9. Recommendations

Based on the findings of this study, the following recommendations are proposed to strengthen digital transformation and improve the quality of higher education:

1. Universities should organize **regular and specialized training programs** for professors in digital teaching methods and platforms such as Moodle, Zoom, and Google Meet.
2. Training programs should be expanded to include **practical digital competencies**, including digital content creation, virtual classroom management, and electronic assessment techniques.
3. Institutions should provide **adequate technological infrastructure**, including modern equipment and reliable internet access, to support effective digital teaching.
4. Professors should be actively involved in the **design and evaluation of training programs** to ensure that these programs address their real needs and challenges.
5. Universities should establish **digital support centers** to provide continuous technical and pedagogical assistance to faculty members.
6. Collaboration between universities and **specialized digital education institutions** should be strengthened in order to exchange best practices and experiences.
7. Efforts should be made to raise awareness among faculty members about digital transformation as a **comprehensive cultural and pedagogical shift**, rather than merely a technological change.

Ethical Considerations

This study was conducted in accordance with internationally accepted ethical standards for research involving human participants. Participation in the study was entirely voluntary, and all respondents were informed about the purpose and nature of the research prior to data collection.

Informed consent was obtained from all participants, and they were assured that their responses would remain confidential and used solely for academic and research purposes. No personal identifying information was collected or disclosed at any stage of the research process.

The study did not involve any form of physical or psychological risk to participants. All procedures were carried out in compliance with the ethical principles outlined by the Committee on Publication Ethics (COPE) and in line with institutional guidelines for social science research.

Acknowledgements

The author would like to express sincere gratitude to all professors of the Faculty of Humanities and Social Sciences at Mohamed El Bachir El Ibrahimi University of Bordj Bou Arreridj who participated in this study.

Special thanks are extended to the university administration for facilitating access to the research population and supporting the data collection process. The author also appreciates the valuable contributions of colleagues and reviewers whose insights helped improve the quality of this research.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors. The study was conducted independently by the author as part of academic research activities.

Conflict of Interest

The author declares that there are no conflicts of interest regarding the publication of this paper. The research was conducted without any financial or personal relationships that could have influenced the results or interpretation of the findings.

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