Evaluating the Effectiveness of Digital Training Programs for Newly Recruited University Teachers: Evidence from Algerian Higher Education Using Kirkpatrick's Model

Hanene HOUARI, The Grand Meghreb- Economy & Society laboratory, University of Constantine2-Abdulhamid Mehri (Algeria), hanen.houari@univ-constantine2.dz

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Abstract:

This study evaluates the effectiveness of mandatory digital and pedagogical training programs for newly recruited university faculty members in Algeria. Guided by Kirkpatrick's four-level evaluation model, the research adopts a descriptive-analytical approach based on survey data collected from 70 newly appointed lecturers across Algerian universities. The findings reveal positive outcomes in terms of participant satisfaction and knowledge acquisition, with similarly favorable perceptions of behavioral transfer. Institutional outcomes were comparatively less pronounced; indicating limitations in translating acquired competencies into broader institutional impact. The study concludes with recommendations to enhance training effectiveness, strengthen post-training follow-up, and improve research and institutional performance within higher education institutions.

Keywords: Training Effectiveness, Digital Transformation, Kirkpatrick Model, Higher Education Governance, Learning Transfer Climate, Scientific Research Productivity.

Jel Classification Codes: M53, I23, O33

1. INTRODUCTION

The higher education sector is currently undergoing profound and irreversible transformations driven by rapid technological advancement, accelerating digitalization, and increasingly complex societal and labor market expectations. Universities worldwide are under sustained pressure to modernize their pedagogical and administrative models, enhance institutional effectiveness, and align their outputs with the requirements of knowledge-based economies. Within this context, digital transformation has emerged as a strategic imperative rather than a mere technological option, requiring the systematic integration of digital technologies across teaching, learning, research, and governance processes (Vial, 2019). This transition has been further accelerated by recent global disruptions, which have intensified the adoption of technology-enhanced learning environments and increased investment in digital infrastructure and faculty development initiatives (Crawford, Kerryn , Rudolph , Sophia, & Bashar , 2020). However, technological investment alone cannot ensure successful transformation, as its effectiveness ultimately depends on the readiness of academic staff to adopt and integrate digital technologies into their professional practices (Bond, Victoria , Carina , & al, 2018); (Steinert & al, 2016).

Consequently, professional development programs have become a strategic instrument for strengthening digital literacy, pedagogical innovation, instructional design competencies, and teaching effectiveness in higher education institutions. Although previous studies have demonstrated their potential to enhance faculty performance and support innovation (Philipsen, Jo , & Natalie , 2019), training effectiveness should not be assumed solely on the basis of implementation. Rather, it requires rigorous evaluation to determine whether acquired knowledge and skills are translated into sustained behavioral change and meaningful organizational outcomes. This concern is reinforced by the persistent gap identified in the literature between learning achievements and their practical application in workplace settings (Blume, J, & Jason , 2010).

To address this challenge, the Kirkpatrick Four-Level Model offers one of the most widely recognized and validated frameworks for evaluating

training effectiveness through four complementary dimensions: reaction, learning, behavior, and results (Kirkpatrick & James , 2016). Despite the growing body of research on digital transformation and faculty development, relatively few studies have adopted a comprehensive multi-level evaluation approach, particularly in developing-country higher education systems where digital transformation initiatives often face organizational, technological, and resource-related constraints.

Against this backdrop, the present study addresses the uncertainty surrounding the perceived effectiveness of mandatory digital and pedagogical training programs in developing the competencies of newly recruited university faculty members and supporting their translation into professional practice and institutional outcomes. Accordingly, the central research question is formulated as follows: ***To what extent are mandatory digital and pedagogical training programs effective in empowering newly recruited university faculty members when evaluated across the four levels of the Kirkpatrick model?***

To operationalize this research problem, the study is guided by the following sub-research questions:

- ***RQ1:*** To what extent do faculty members demonstrate positive reactions toward digital training programs?
- ***RQ2:*** To what extent do digital training programs contribute to the acquisition of knowledge, skills, and digital competencies among faculty members?
- ***RQ3:*** To what extent are acquired competencies translated into professional behaviors and teaching practices?
- ***RQ4:*** To what extent do digital training programs contribute to broader institutional and educational outcomes?

Drawing on Kirkpatrick's evaluation framework, the following hypotheses are proposed:

- ***H1:*** Digital training programs generate positive participant reactions among university faculty members.
- ***H2:*** Digital training programs contribute positively to faculty members' knowledge, skills, and digital competencies.
- ***H3:*** Digital training programs positively influence faculty members' professional behavior and teaching practices.
- ***H4:*** Digital training programs contribute positively to institutional and educational outcomes within higher education institutions.

2. LITERATURE REVIEW

In contemporary higher education, digital transformation has intensified expectations regarding faculty competencies and institutional adaptability, making the effectiveness of digital and pedagogical training a key concern. This has led to growing interest in understanding how such programs contribute to bridging the gap between technological integration and effective teaching practice, as well as their broader role in supporting institutional change.

2.1 Digital Transformation in Higher Education

Digital transformation has become a defining characteristic of contemporary higher education systems. While early discussions focused primarily on the adoption of information and communication technologies, recent scholarship conceptualizes digital transformation as a comprehensive organizational process involving strategic, cultural, technological, and pedagogical changes (Vial, 2019). Within higher education institutions, digital transformation extends beyond the digitization of administrative processes to encompass the redesign of teaching practices, learning environments, research activities, and institutional governance structures.

The growing significance of digital transformation is largely driven by rapid technological developments, including artificial intelligence, cloud computing, learning analytics, big data, and digital collaboration platforms. These technologies have fundamentally altered how knowledge is produced, disseminated, and consumed, requiring universities to rethink traditional educational models and develop more flexible, technology-

enhanced learning ecosystems (Bond, Victoria , Carina , & al, 2018). Consequently, higher education institutions are increasingly expected to align their academic missions with the demands of digital societies and knowledge-based economies.

The COVID-19 pandemic further accelerated digital transformation initiatives across universities worldwide. The sudden transition to remote and online learning exposed significant disparities in institutional digital readiness and highlighted the critical importance of digital competencies among academic staff (Crawford, Kerryn , Rudolph , Sophia, & Bashar , 2020). As a result, universities have intensified investments in digital infrastructure, online learning systems, and professional development programs aimed at strengthening faculty members' ability to operate effectively in digital educational environments.

Recent studies emphasize that successful digital transformation depends not only on technological resources but also on human and organizational capabilities (Kane, Doug , Anh , David , & Natasha , 2015). Faculty members play a pivotal role in this process because they directly influence the integration of digital technologies into teaching and learning activities. Without adequate digital competencies, even advanced technological infrastructures may fail to generate meaningful educational improvements (Noe, 2020). Therefore, faculty development has emerged as a strategic component of higher education digital transformation strategies.

Furthermore, digital transformation has reshaped expectations regarding academic performance and professional competencies. Contemporary faculty members are increasingly required to master digital pedagogies, virtual classroom management, online assessment techniques, and data-informed instructional practices (Redecker, 2017). These evolving expectations have created a growing demand for continuous professional development initiatives designed to support faculty adaptation to rapidly changing technological environments.

Despite the widespread recognition of digital transformation as a strategic imperative, challenges remain regarding the effective preparation

of academic staff to engage with digital change. Previous research suggests that universities frequently invest in technological solutions without adequately evaluating whether training initiatives successfully equip faculty members with the knowledge, skills, and behaviors necessary for sustainable digital transformation (Bond, Victoria , Carina , & al, 2018); (Kane, Doug , Anh , David , & Natasha , 2015). This observation highlights the importance of systematically assessing the effectiveness of digital training programs within higher education institutions.

2.2 Faculty Development and Digital Competencies

Faculty development has become a strategic priority for higher education institutions seeking to enhance educational quality, support innovation, and respond effectively to ongoing digital transformation initiatives. Traditionally, faculty development focused primarily on improving teaching effectiveness, curriculum design, and research productivity. However, the rapid expansion of digital technologies has significantly broadened the scope of professional development, placing increasing emphasis on digital competencies and technology-enhanced pedagogical practices.

Digital competencies refer to the knowledge, skills, attitudes, and ethical considerations required to effectively use digital technologies in professional and educational contexts (Redecker, 2017). Within higher education, these competencies extend beyond basic technological literacy and include the ability to design digital learning environments, facilitate online collaboration, implement technology-supported assessment strategies, and critically evaluate digital resources. Consequently, the development of digital competencies has become an essential prerequisite for effective teaching and learning in contemporary universities.

The growing importance of faculty digital competencies is closely associated with the emergence of student-centered learning approaches and the increasing adoption of blended and online education models. Research suggests that instructors who possess strong digital competencies are more capable of integrating innovative teaching methods, fostering student engagement, and promoting active learning experiences (Tondeur, Johan , Fazilat , Evrim , & al, 2017). Conversely, insufficient digital preparedness

may limit the effectiveness of technological investments and hinder institutional efforts to achieve meaningful digital transformation.

In response to these challenges, universities have increasingly implemented professional development programs designed to support faculty adaptation to evolving technological environments. Such programs typically address a broad range of competencies, including instructional technology integration, online course design, virtual classroom management, digital assessment, learning analytics, and educational innovation. Effective faculty development initiatives not only enhance individual capabilities but also contribute to broader organizational objectives by promoting a culture of continuous learning and innovation.

Recent literature highlights that the success of faculty development programs depends on several factors, including institutional support, training relevance, participant motivation, and opportunities for practical application (Steinert & al, 2016). Importantly, professional development initiatives must be aligned with institutional digital transformation strategies to ensure that acquired competencies translate into sustainable improvements in teaching practices and organizational performance.

Despite the increasing availability of digital training opportunities, evidence regarding their effectiveness remains mixed. While many studies report improvements in faculty confidence and technological proficiency, fewer investigations have examined whether these gains result in long-term behavioral changes and measurable educational outcomes (Philipsen, Jo , & Natalie , 2019). This limitation underscores the importance of adopting comprehensive evaluation frameworks capable of assessing multiple dimensions of training effectiveness, including participant satisfaction, learning outcomes, behavioral transfer, and organizational impact.

Given the central role of faculty members in implementing digital transformation initiatives, evaluating the effectiveness of digital training programs has become a critical area of inquiry. Understanding how training interventions influence faculty competencies and professional practices can provide valuable insights for university administrators and policymakers

seeking to maximize the return on investments in faculty development and digital transformation.

2.3 Training Effectiveness and Evaluation

Training effectiveness has long been recognized as a critical indicator of organizational performance and human resource development. As organizations increasingly invest substantial resources in professional development initiatives, the need to assess whether training programs achieve their intended objectives has become a major concern for both researchers and practitioners. In higher education, evaluating training effectiveness is particularly important because faculty development programs are expected not only to improve individual competencies but also to contribute to broader institutional goals such as educational quality enhancement, innovation, and digital transformation.

The concept of training effectiveness generally refers to the extent to which a training intervention achieves its desired outcomes. These outcomes may include knowledge acquisition, skill development, behavioral change, improved job performance, and organizational benefits (Salas, Scott , Kurt, & Kimberly, 2012). Consequently, training effectiveness should not be viewed as a single-dimensional construct but rather as a multidimensional process involving several interconnected stages that occur before, during, and after training implementation.

The literature identifies several factors that influence training effectiveness. Individual characteristics such as motivation, self-efficacy, prior experience, and learning readiness play an important role in determining training outcomes. Similarly, organizational factors including managerial support, institutional culture, resource availability, and opportunities for applying acquired competencies significantly affect the transfer of learning to workplace settings (Burke-Smalley & Holly , 2007). In higher education institutions, these factors become particularly relevant because faculty members often operate within complex professional environments characterized by diverse teaching responsibilities and varying levels of technological preparedness.

One of the most important dimensions of training effectiveness concerns learning transfer, defined as the extent to which knowledge and

skills acquired during training are applied in professional practice. Research consistently demonstrates that successful training programs must extend beyond immediate learning outcomes and generate sustainable behavioral changes that contribute to organizational improvement (Blume, J, & Jason , 2010). This perspective is especially relevant in the context of digital transformation, where the ultimate objective of training is not merely to increase technological awareness but to facilitate meaningful changes in teaching practices and institutional performance.

The increasing complexity of professional development initiatives has led scholars to emphasize the importance of systematic evaluation processes. Effective evaluation enables organizations to determine whether training investments generate measurable returns and provides evidence for improving future training design and implementation. Furthermore, comprehensive evaluation frameworks help identify strengths and weaknesses in training programs and support evidence-based decision-making regarding professional development policies.

Within higher education institutions, the evaluation of digital training programs has become increasingly important due to the substantial investments made in faculty development initiatives. Universities require reliable mechanisms to assess whether training programs successfully enhance digital competencies, promote pedagogical innovation, and support institutional transformation objectives. Consequently, robust evaluation models are necessary to capture the multiple dimensions of training effectiveness and provide a comprehensive understanding of training outcomes.

Among the various approaches proposed in the literature, the Kirkpatrick Four-Level Model remains one of the most widely adopted and influential frameworks for evaluating training effectiveness. Its enduring popularity stems from its ability to assess both immediate and long-term outcomes while providing a structured framework for understanding how training interventions influence individuals and organizations. The

following section examines this model in greater detail and explains its relevance to the evaluation of digital training programs in higher education.

2.4 Kirkpatrick's Four-Level Evaluation Model

The evaluation of training effectiveness has attracted considerable scholarly attention over the past several decades, leading to the development of numerous theoretical and practical evaluation frameworks. Among these frameworks, the Kirkpatrick Four-Level Model remains the most influential and widely applied approach for assessing training outcomes across various organizational settings. Originally developed by Donald Kirkpatrick in the late 1950s, the model provides a systematic and comprehensive framework for evaluating the effectiveness of training interventions by examining outcomes at four interconnected levels: reaction, learning, behavior, and results (Kirkpatrick & James , 2016).

The enduring popularity of the Kirkpatrick model can be attributed to its simplicity, practicality, and adaptability across different professional contexts. Unlike evaluation approaches that focus exclusively on immediate learning outcomes, the Kirkpatrick framework recognizes that training effectiveness extends beyond knowledge acquisition and should ultimately contribute to meaningful organizational improvements. Consequently, the model offers a multidimensional perspective that captures both short-term and long-term effects of training interventions.

The first level, Reaction, measures participants' immediate perceptions and satisfaction regarding the training experience. This dimension examines factors such as training relevance, content quality, instructional methods, learning environment, and overall participant engagement. Positive reactions are generally considered important because they influence learners' motivation and willingness to engage with training activities. However, scholars emphasize that participant satisfaction alone cannot be regarded as sufficient evidence of training effectiveness, as favorable reactions do not necessarily guarantee learning or behavioral change (Alliger & ELIZABETH , 1989).

The second level, Learning, assesses the extent to which participants acquire the intended knowledge, skills, competencies, attitudes, or behavioral capabilities as a result of training. This stage focuses on

measuring changes in cognitive understanding and professional competence through assessments, examinations, self-evaluations, or other learning indicators. Within the context of digital transformation, learning outcomes may include improvements in digital literacy, instructional technology integration, online teaching methodologies, and digital assessment practices. The learning dimension represents a critical intermediary stage linking training participation to subsequent professional application.

The third level, Behavior, evaluates whether acquired competencies are effectively transferred to workplace practice. Often referred to as transfer of training, this dimension examines the extent to which participants apply newly acquired knowledge and skills in their professional activities. In higher education settings, behavioral changes may manifest through increased use of educational technologies, adoption of innovative teaching strategies, improved online course management, and enhanced student engagement practices. Research indicates that behavioral transfer is influenced by multiple contextual factors, including organizational support, leadership commitment, workplace culture, and opportunities for practical application (Burke-Smalley & Holly , 2007).

The fourth and final level, Results, focuses on the broader organizational outcomes generated by training interventions. In empirical applications, however, the measurement of this level may require objective institutional indicators or multiple data sources; therefore, participant-based assessments should be interpreted as perceptions of organizational outcomes rather than direct measures of institutional performance. These outcomes may include improvements in productivity, service quality, institutional effectiveness, innovation capacity, stakeholder satisfaction, and strategic performance indicators. Within higher education institutions, training results may be reflected in enhanced teaching quality, improved student learning experiences, increased adoption of digital technologies, and strengthened institutional readiness for digital transformation. This level is particularly important because it connects individual learning outcomes to organizational objectives and strategic priorities.

Despite its widespread adoption, the Kirkpatrick model has not been immune to criticism. Some scholars argue that the framework assumes a linear relationship between the four evaluation levels and may oversimplify the complex factors influencing training outcomes (Westerman, Didier , & Andrew , 2014). Others suggest that measuring organizational results can be methodologically challenging due to the presence of multiple external influences. Nevertheless, the model continues to serve as a dominant evaluation framework because of its practical applicability, conceptual clarity, and strong alignment with evidence-based approaches to professional development assessment.

Given its comprehensive structure and widespread acceptance, the Kirkpatrick Four-Level Model provides an appropriate theoretical foundation for evaluating the effectiveness of digital training programs in higher education. By examining participants' reactions, learning outcomes, behavioral changes, and organizational results, the model enables a holistic assessment of how digital training initiatives contribute to faculty development and institutional digital transformation.

3. RESEARH METHODOLOGY AND INSTRUMENT DESIGN

This study employed an empirical, quantitative, descriptive-analytical research design to examine the perceived effectiveness of mandatory digital and pedagogical training programs among newly recruited university faculty members in Algeria. The analysis was structured according to the four levels of Kirkpatrick’s evaluation model: reaction, learning, behavior, and results. The quantitative approach was used to capture participants’ perceptions through a standardized questionnaire, while the descriptive-analytical design enabled the identification and interpretation of patterns across the four dimensions.

3.1 Research Design

The study was conducted within Algerian higher education institutions engaged in digital transformation and professional development initiatives. The research focused specifically on newly recruited faculty members who participated in mandatory digital and pedagogical training programs during the early stage of their academic integration. The study sought to assess

participants' perceptions of training effectiveness across the four levels of Kirkpatrick's model rather than to establish experimental or causal effects.

A quantitative survey design was adopted because it allows standardized measurement of participants' responses across a common set of indicators. The four-level framework provided the analytical structure for distinguishing between immediate reactions to training, perceived learning and competency development, perceived transfer of competencies into teaching practice, and perceived broader institutional and educational outcomes.

3.2 Research Context and Participants

The target population consisted of university faculty members recruited during the 2023 national recruitment wave who completed the mandatory digital and pedagogical training program designed to support their pedagogical adaptation and integration into the academic environment. The final sample comprised 70 newly recruited faculty members representing different disciplinary fields and higher education institutions.

Participants were selected using purposive non-probability sampling, based on their participation in the training program and their availability to complete the questionnaire. This approach enabled the study to focus specifically on faculty members who had directly experienced the training under investigation. However, because the sample was not selected probabilistically, the findings should not be interpreted as statistically representative of the entire population of newly recruited university faculty members in Algeria. Rather, they provide empirical evidence concerning the perceptions of the participants included in the study.

The inclusion of participants from different institutions and disciplinary fields provides some diversity within the sample and broadens the range of perspectives captured by the study. Nevertheless, the study does not claim proportional representation across Algerian universities or academic disciplines.

3.3 Instrument Development

Data were collected using a structured questionnaire developed according to the four dimensions of Kirkpatrick's model. The instrument comprised 20 items distributed across reaction, learning, behavior, and results dimensions, in addition to demographic information. Responses were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with the behavioral and results dimensions reflecting participants' self-reported perceptions of training transfer and institutional outcomes.

3.4 Validity and Reliability

To ensure the scientific rigor of the research instrument, both validity and reliability procedures were implemented. Content validity was established through a comprehensive review of the relevant literature on digital transformation, faculty development, training effectiveness, and the Kirkpatrick evaluation framework. The questionnaire items were carefully aligned with the conceptual dimensions identified in the theoretical framework.

Table 1. Reliability Analysis of the Research Instrument

Kirkpatrick Evaluation Dimension	Number of Items	Cronbach's Alpha	Methodological Acceptance Level
Dimension 1: Participant Reaction (Level 1)	05	0.842	Excellent Internal Consistency
Dimension 2: Cognitive Learning (Level 2)	05	0.830	Excellent Internal Consistency
Dimension 3: Behavioral Transfer (Level 3)	05	0.787	Strong Reliability Threshold
Dimension 4: Institutional Results (Level 4)	05	0.802	Excellent Internal Consistency

Source: Authors' calculations based on SPSS outputs.

Reliability was assessed using Cronbach's Alpha coefficient, which is widely recognized as an appropriate measure of internal consistency for survey-based research. According to established methodological standards, Cronbach's Alpha values exceeding 0.70 indicate acceptable levels of reliability, while values above 0.80 reflect strong internal consistency.

The reliability analysis confirmed that the questionnaire provided a consistent and dependable measure of participants' perceptions regarding digital training effectiveness.

3.5 Data Collection Procedures

Data were collected following the completion of training activities. Participation was voluntary, and respondents were assured of anonymity and confidentiality. The collected data were analyzed using SPSS. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to evaluate training effectiveness across the four dimensions. Cronbach's Alpha coefficients were calculated to assess reliability, while the interpretation of results was guided by Kirkpatrick's Four-Level Model.

3.6 Data Analysis Techniques

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistical techniques were employed to summarize participants' responses and evaluate the overall effectiveness of digital training programs. These techniques included frequencies, percentages, means, and standard deviations.

To assess the reliability of the measurement instrument, Cronbach's Alpha coefficients were calculated for the overall questionnaire and its individual dimensions. Additionally, inferential statistical procedures were employed where appropriate to examine relationships among variables and evaluate the significance of observed patterns.

The interpretation of findings was guided by the Kirkpatrick Four-Level Model, allowing for a comprehensive assessment of participants' reactions, learning outcomes, behavioral changes, and organizational results.

4. RESULTS

The empirical findings reveal a differentiated pattern in participants' perceptions of training effectiveness across the four Kirkpatrick dimensions. Overall, the highest mean scores were recorded for learning (M = 4.14) and behavior (M = 4.09), followed by reaction (M = 3.78) and results (M = 3.76). These findings indicate particularly favorable perceptions of competency development and its reported application in teaching practice, while broader institutional and educational outcomes were comparatively less pronounced.

The results should be interpreted as participants' reported perceptions of training outcomes. In particular, the Behavior and Results dimensions reflect perceived transfer and perceived institutional outcomes rather than independently verified behavioral or organizational changes.

4.1 Reaction Level

The first level of Kirkpatrick's evaluation framework examines participants' immediate reactions to the training experience. As presented in Table 2, the overall mean score for the reaction dimension reached 3.78 out of 5, indicating a generally positive perception of the digital training programs among newly recruited faculty members.

Table 2. Reaction Level Assessment

Item Code	Indicator	Mean	SD	Rank
L1_01	Training content suitability	3.98	0.68	1
L1_02	Trainer competence	3.87	0.72	2
L1_03	Relevance to teaching duties	3.79	0.74	3
L1_04	Digital tools effectiveness	3.67	0.70	4
L1-05	Training conditions	3.59	0.80	5
	Overall Mean	**3.78**	—	—

Source: SPSS outputs.

At the item level, Training Content Suitability achieved the highest mean (M = 3.98; SD = 0.68; Rank = 1), indicating that participants generally viewed the training content as relevant to their professional and

academic needs. The relatively low standard deviation suggests a fairly consistent assessment among respondents. Trainer Competence ranked second (M = 3.87; SD = 0.72), followed by Relevance to Teaching Duties (M = 3.79; SD = 0.74). These scores indicate that the participants also expressed favorable perceptions regarding the quality of training delivery and its relevance to their teaching responsibilities.

Lower mean scores were observed for Digital Tools Effectiveness (M = 3.67; SD = 0.70) and Training Conditions (M = 3.59; SD = 0.80), which ranked fourth and fifth, respectively. Although both indicators remained above the midpoint of the five-point scale, the higher standard deviation for training conditions indicates greater variability in respondents' assessments of this aspect. Overall, the five indicators were positively rated, with the findings providing descriptive support for H1 and indicating that the most favorably perceived aspects of the training were its content, trainer competence, and relevance to teaching duties.

4.2 Learning Level

The second level of Kirkpatrick's framework focuses on the knowledge and competencies perceived to have been acquired through the training. Table 3 reports an overall mean of 4.14 out of 5, reflecting a high perceived level of learning among the surveyed faculty members.

Table 3. Learning Level Assessment

Item Code	Indicator	Mean	SD	Rank
L2_01	Acquisition of pedagogical concepts	4.24	0.68	1
L2_02	Course design competencies	4.21	0.71	2
L2_03	Digital teaching competencies	4.18	0.61	3
L2_04	Understanding academic role	4.08	0.66	4
L2-05	Assessment competencies	3.99	0.75	5
	Overall Mean	**4.14**	—	—

Source: SPSS outputs

The strongest result concerns Acquisition of Pedagogical Concepts (M = 4.24; SD = 0.68), followed by Course Design Competencies (M = 4.21; SD = 0.71) and Digital Teaching Competencies (M = 4.18; SD = 0.61). The relatively low dispersion associated with digital teaching competencies indicates a high degree of consistency in participants' assessments of this aspect. Understanding of the Academic Role also received a favorable score (M = 4.08; SD = 0.66), while Assessment Competencies recorded the lowest mean (M = 3.99; SD = 0.75).

The narrow variation in the mean scores, together with the generally moderate standard deviations, indicates that positive perceptions were distributed across the different learning components rather than concentrated in a single area. Overall, these findings provide descriptive support for H2, suggesting that the training was perceived as contributing substantially to participants' pedagogical, course-design, and digital teaching competencies.

4.3 Behavior Level

The behavioral dimension provides an indication of how far the acquired competencies were perceived to be reflected in teaching practice. Table 4 shows an overall mean of 4.09, pointing to a high level of self-reported behavioral transfer.

Table 4. Behavior Results Assessment

Item Code	Indicator	Mean	SD	Rank
L3_01	Application of acquired knowledge	4.18	0.64	1
L3_02	Improved interaction with students	4.13	0.68	2
L3_03	Adoption of new teaching strategies	4.08	0.66	3
L3_04	Regular use of digital resources	4.05	0.70	4
L3-05	Continuous teaching improvement	4.01	0.74	5
	Overall Mean	**4.09**	—	—

Source: SPSS outputs

The highest score was observed for Application of Acquired Knowledge (M = 4.18; SD = 0.64), followed by Improved Interaction with

Students (M = 4.13; SD = 0.68) and Adoption of New Teaching Strategies (M = 4.08; SD = 0.66). Regular Use of Digital Resources and Continuous Teaching Improvement also recorded favorable means of 4.05 (SD = 0.70) and 4.01 (SD = 0.74), respectively. The relatively small differences among the five indicators suggest a consistent pattern of perceived application across teaching-related behaviors.

Taken together, the results provide descriptive support for H3, indicating that respondents perceived a substantial transfer of training outcomes into their academic practices. Nevertheless, these findings reflect participants' self-reported behavior rather than independently observed or supervisor-assessed changes, and should therefore be interpreted as perceived behavioral transfer.

4.4 Results Level

At the fourth level, the analysis moves from individual learning and reported behavioral transfer to participants' perceptions of broader institutional and educational outcomes. Table 5 records an overall mean of 3.76, the lowest of the four Kirkpatrick dimensions, but still above the midpoint of the five-point scale.

Table 5. Results Level Assessment

Item Code	Indicator	Mean	SD	Rank
L4_01	Institutional engagement	3.94	0.76	1
L4_02	Academic performance improvement	3.86	0.82	2
L4_03	Digital technology integration	3.82	0.81	2
L4_04	Reduction of professional difficulties	3.71	0.84	4
L4-05	Research performance improvement	3.47	1.01	5
	Overall Mean	**3.76**	—	—

Source: SPSS outputs

Accordingly, the result should be interpreted as a relatively less pronounced, rather than weak, perceived institutional impact. The highest-

rated outcome was Institutional Engagement (M = 3.94; SD = 0.76), followed by Academic Performance Improvement (M = 3.86; SD = 0.82) and Digital Technology Integration (M = 3.82; SD = 0.81). Reduction of Professional Difficulties achieved M = 3.71 (SD = 0.84), while Research Performance Improvement recorded the lowest mean (M = 3.47; SD = 1.01) and the highest standard deviation, indicating substantially greater variation in participants' perceptions of this outcome.

The overall mean of 3.76 should therefore be interpreted in relative rather than absolute terms. It was the lowest mean among the four dimensions, but it remained above the midpoint of the scale, indicating a comparatively less pronounced perceived institutional impact rather than a weak outcome. This distinction is important when assessing H4, particularly because the Results dimension was measured through participants' perceptions rather than objective institution-level indicators.

5. DISCUSSION

This study examined the perceived effectiveness of mandatory digital and pedagogical training programs for newly recruited university faculty members in Algeria using Kirkpatrick's Four-Level Model. Based on the responses of 70 participants, the findings reveal a differentiated pattern across the four levels. The highest mean was recorded for learning (M = 4.14), followed by behavior (M = 4.09), whereas reaction (M = 3.78) and results (M = 3.76) were comparatively lower. This pattern suggests that the training was perceived as particularly effective in developing competencies and supporting their application in teaching practice, while broader institutional outcomes were less pronounced.

The reaction score of 3.78 indicates a generally favorable training experience, particularly regarding content suitability, trainer competence, and relevance to teaching duties. This finding is consistent with the first level of Kirkpatrick's framework. However, as noted by (Alliger & ELIZABETH , 1989), positive reactions alone do not guarantee learning or subsequent organizational effects. In the present study, the higher learning score suggests that favorable perceptions were accompanied by stronger perceived competency development, while the relatively lower ratings for

digital tools and training conditions identify aspects of implementation requiring attention.

The learning level recorded the highest overall mean (4.14), with particularly strong ratings for pedagogical concepts (4.24), course design (4.21), and digital teaching competencies (4.18). These results support the literature emphasizing faculty development as a key mechanism for strengthening digital and pedagogical capabilities (Philipsen, Jo , & Natalie , 2019); (Steinert & al, 2016). They also reinforce the importance of educator digital competencies in supporting digital transformation in higher education (Redecker, 2017). The findings therefore provide descriptive support for H2.

The behavior level produced a similarly high mean (4.09), with the strongest result for application of acquired knowledge (4.18), followed by improved interaction with students (4.13) and adoption of new teaching strategies (4.08). The small difference between learning and behavior suggests that participants perceived a relatively favorable transfer of acquired competencies into teaching practice. This is consistent with the learning-transfer perspective of (Blume, J, & Jason , 2010) and (Burke-Smalley & Holly , 2007). Nevertheless, because behavior was assessed through self-report, the findings represent perceived behavioral transfer rather than independently verified behavioral change. The results therefore provide descriptive support for H3.

The results level had the lowest overall mean (3.76), but this score remained above the midpoint of the five-point scale. It should therefore be interpreted as a comparatively less pronounced perceived institutional impact rather than a weak outcome. Institutional engagement (3.94), academic performance improvement (3.86), and digital technology integration (3.82) were rated relatively favorably. By contrast, research performance improvement recorded the lowest mean (3.47; SD = 1.01), indicating a weaker and more heterogeneous perception of the training's contribution to research-related outcomes. The findings provide descriptive support for H4, while suggesting that the effects of training were more

evident in teaching and institutional integration than in research performance.

The overall pattern does not indicate a simple linear decline across the four Kirkpatrick levels. Rather, the strongest perceived outcomes occurred at the learning and behavior stages, while reaction and particularly broader results were comparatively lower. This distinction is consistent with the view that training effectiveness depends not only on individual learning but also on contextual factors such as organizational support, technological resources, and opportunities for application (Burke-Smalley & Holly , 2007); (Vial, 2019). Thus, training alone may not be sufficient to generate broader institutional change.

From a theoretical perspective, the study contributes empirical evidence from the Algerian higher education context, particularly among newly recruited faculty members undergoing mandatory digital and pedagogical training. It extends the application of Kirkpatrick's framework to a context where professional adaptation, digital competency development, and institutional integration occur simultaneously. Practically, the findings suggest the need to strengthen post-training support, opportunities for application, and research-oriented development alongside existing pedagogical and digital training.

Finally, the findings should be interpreted cautiously given the purposive non-probability sample and reliance on self-reported data. This limitation is particularly relevant to the behavior and results levels, where objective indicators and multiple data sources would provide stronger evidence. The present study therefore captures perceived training effectiveness, rather than independently verified behavioral or institutional change, while providing an empirical basis for improving faculty development within Algerian universities.

6. THEORETICAL AND PRACTICAL CONTRIBUTIONS

This study contributes to the literature by applying Kirkpatrick's Four-Level Model to the evaluation of mandatory digital and pedagogical training among newly recruited university faculty members in the Algerian

higher education context. It extends existing evidence by examining perceived outcomes across reaction, learning, behavior, and institutional results within a setting that remains relatively underrepresented in the international literature.

Practically, the findings suggest that universities should complement training delivery with structured post-training support, opportunities for competency application, and targeted development of research capabilities to strengthen the transition from individual learning to broader institutional outcomes.

7. CONLUSION

This study examined the perceived effectiveness of mandatory digital and pedagogical training programs among newly recruited university faculty members in Algeria through the four levels of Kirkpatrick's evaluation model. Based on the responses of 70 participants, the findings indicate an overall favorable assessment of the training, with the strongest perceived outcomes occurring at the learning level (M = 4.14) and the behavior level (M = 4.09), followed by reaction (M = 3.78) and results (M = 3.76). This pattern suggests that the training was perceived primarily as a mechanism for developing pedagogical and digital competencies and supporting their application in teaching practice, while its broader institutional effects were comparatively less pronounced.

With respect to the hypotheses, H1 is descriptively supported by the favorable overall reaction to the training; H2 is descriptively supported by the high level of perceived knowledge and competency development; and H3 is descriptively supported by the high reported level of transfer of acquired competencies into teaching practices. H4 is likewise descriptively supported, although the results dimension recorded the lowest overall mean. Importantly, the score of 3.76 should not be interpreted as a weak outcome, but rather as a comparatively less pronounced perceived institutional effect. The substantially lower rating for research performance improvement (M = 3.47; SD = 1.01) further indicates that the perceived benefits of the training

were more evident in pedagogical and digital domains than in research-related outcomes.

The study contributes to the literature by providing empirical evidence from the Algerian higher education context and by applying Kirkpatrick's framework to newly recruited faculty members during their early professional integration. However, the findings remain subject to the limitations of purposive non-probability sampling and self-reported measurement, particularly for behavioral and institutional outcomes. Accordingly, the results should be understood as evidence of perceived training effectiveness rather than independently verified changes in behavior or organizational performance.

To strengthen the practical impact of future training programs, universities should establish a structured six-month post-training follow-up system combining mentoring, periodic feedback, and monitoring of competency application. They should also ensure continuous access to digital tools and technical support after training, introduce targeted research-development activities such as methodological workshops and research mentoring, and link training outcomes to departmental development plans. Finally, future evaluations should combine participant questionnaires with classroom observation, supervisor assessments, and objective institutional indicators where available. These measures would strengthen the transition from training participation and competency acquisition to sustained professional practice and broader institutional outcomes.

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