ПРОБЛЕМИ ОСВІТИ

PROBLEMS OF EDUCATION

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FROM RESISTANCE TO READINESS: A ULTIDIMENSIONAL ANALYSIS OF *E*-LEARNING IN HIGHER EDUCATION

This study aimed to evaluate the effectiveness of the ADKAR model in assessing the readiness of Algerian universities to adopt e-learning, and to explore the role of motivation and satisfaction in influencing the personal and behavioral aspects of students and academics. The results showed that satisfaction and motivation have significant positive effects on the high readiness for e-learning integration, and that the ADKAR model is highly effective in evaluating the readiness of higher education institutions.

Keywords*: ADKAR model; Algerian university; e-learning readiness; motivation; satisfaction.*

The COVID-19 pandemic has posed a significant global challenge, profoundly impacting both individuals and society. Concurrently, advancements in the Fourth Industrial Revolution, marked by extensive use of computer applications, networks, the Internet of Things, big data, and artificial intelligence, have reshaped organizational interactions with communities through digitalization. These changes have similarly affected education, leading to rapid transformations in teaching methods

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and learning approaches. This urgency calls for swift administrative and educational adaptations to address evolving needs and optimize outcomes. However, universities have been slower in adopting digital transformation models compared to other optimized industries (Elezi, Bamber, 2021).

E-learning has evolved in response to widespread digital communication technologies and the growth of distance education. It has been refined through increased online engagement among students, content creators, and professionals, offering benefits such as task consistency, adaptability, and accessibility (Lavidas et al., 2023). Virtual programs create optimal learning environments compared to traditional classrooms, with enhanced redundancy in online material access, improved student performance monitoring, and engaging resources (Hashem et al., 2015). Specialized computer-based educational systems like MOOCs, Moodle, Blackboard, and D2L incorporate performance monitoring and feedback mechanisms, utilizing advanced computer technology capabilities such as increased storage, RAM, and CPUs to enhance teaching and learning processes.

The successful adoption of *e*-learning technologies depends on the proactive willingness of enterprise users to align with digital demands (Parlakkiliç, 2013). However, resistance to change among teachers, students, and administrators in educational institutions, accustomed to traditional methods, poses challenges that affect their socioemotional states and performance (Rezaei, Haghani, 2016). Managing the change process involves gradually shifting user attitudes through training and persuasion to enhance digital literacy and meet integration challenges in higher education (Parlakkiliç, 2017).

Change management is crucial in navigating organizational complexities, especially in educational settings, facilitating efficient implementation of transformative processes. Models emphasize building awareness, fostering desire, providing knowledge, ensuring capability, and achieving continuity (Boua'lak, Nawal, 2014). This strategic approach aims to synchronize human and operational processes, integrating conventional management practices to adapt to dynamic environments and shape organizational culture.

On the other hand, Salem and Hanim (2019, p. 167) consider the management of educational change as "the management of planned, organized, and purposeful efforts to bring about modifications in the current state of the institution".

The ADKAR model, introduced by Jeff Hiatt at Prosci in 2006, has been widely utilized across various sectors including healthcare (Cresswell et al., 2013), education (Mudjisusatyo et al., 2024), and business (Hogan, 2018). Research supports its effectiveness in facilitating successful change initiatives within organizations.

This model is particularly valued for managing individual-level change in organizations and educational institutions, helping leaders identify barriers, develop strategies, and support individuals in adapting and progressing through transitions (Kaminski, 2022). By focusing on individual personalities and addressing resistance, the ADKAR model enables leaders to diagnose strengths and weaknesses in supporting and implementing changes, guiding priorities such as nurturing, linking, examining, acquiring, trying, expanding, and renewing (Jackson, 2019).

In educational settings, leveraging models like ADKAR emphasizes the importance of proactive change management, enabling leaders to adopt a structured approach aligned with sector-specific objectives and resources. This supports effective management of operations and promotes constructive engagement with change.

To effectively manage change in educational institutions, leaders must invest in both physical assets and human potential, fostering professional development and shaping employee values, abilities, and actions. Cultivating a cohesive culture that embraces change while advancing technology and organizational structures is crucial. Supervision, leadership, monitoring, and evaluation of these efforts are essential for guiding institutions toward a successful future.

E-learning has experienced a significant surge in popularity, particularly accelerated by the global COVID-19 pandemic. Despite its advantages such as flexibility and convenience, the readiness and motivation of students to engage with online learning environments are critical determinants of their success. Academic motivation and satisfaction play pivotal roles in influencing *e*-learning readiness, affecting students' attitudes toward learning, engagement with course materials, and overall academic performance.

According to Elshareif (2021), academic motivation strongly predicts *e*-learning readiness, with students demonstrating higher motivation levels showing greater readiness to engage with *e*-learning platforms. Similarly, Prifti (2022) finds that students' satisfaction with online learning experiences positively correlates with their readiness to utilize online resources and participate in collaborative activities.

These findings underscore the importance of considering students' motivation and satisfaction levels in the design and implementation of *e*-learning programs. By fostering positive learning experiences that cater to students' preferences and needs, educators can enhance students' readiness to effectively engage with *e*-learning platforms and achieve academic success.

The study's theoretical underpinnings were derived in 2006 from founder Jeff Hiatt Prosci ADKAR model. However, there is limited literature available that confirms the model's validity in this context. Given the significance of identifying the factors shaping the adoption of *e*-learning for successful educational delivery, the subsequent research questions were devised to authenticate the applicability of the ADKAR model within this particular context:

RQ1: To what extent does the ADKAR model provide a suitable explanation enhancing (HE) through the Seamless Integration of *e*-learning environments among academics?

RQ2: What factors influence the adoption of *e*-learning in the local HE landscape?

RQ3: How can academic motivation and satisfaction influence their readiness to practice *e*-learning?

RQ4: How can academic motivation and satisfaction affect their *e*-learning readiness?

This research aims to explore the factors influencing the adoption of *e*-learning among academicians in Algerian Higher Education Institutions (HEIs) by utilizing

the ADKAR model as a conceptual framework in a developing environment. Given the transformative impact of *e*-learning, particularly in the aftermath of the COVID-19 pandemic, understanding the readiness of Algerian academics for this educational shift is crucial. ADKAR model offers insights into how individuals and organizations can effectively manage change, making it relevant for assessing the challenges and opportunities of *e*-learning in Algerian universities. Additionally, examining the roles of motivation and satisfaction within the context of the ADKAR model can provide strategies to enhance the successful implementation of *e*-learning initiatives, addressing barriers and promoting effective adaptation.

ADKAR model and *e*-learning readiness various studies that underscore the effectiveness of the ADKAR model in managing change and assessing readiness across different contexts. Ruele's study (2019) demonstrated the ADKAR model's efficacy in evaluating for assessing the readiness of the Ministry of Education to transition from the British Design and Technology (D&T) curriculum to the Botswana model for upper secondary schools. Abdelaziz (2017) highlighted the model's importance in addressing resistance among public education teachers. Adams et al. (2018) and Blayone et al. (2018) explored readiness for blended and mobile learning, respectively, showing varied readiness factors. Al-Alawi et al. (2019) discussed challenges in implementing change strategies in Gulf universities using the ADKAR model effectively. Glegg et al. (2019) found the ADKAR model useful in managing project implementations. Faishol, & Subriadi (2022) explored practical applications of the ADKAR model in organizational contexts, showing positive outcomes. Finally, Arthur-Nyarko et al (2020) addressed readiness issues among distance education students in Ghana, emphasizing challenges in accessing digital learning materials.

A modern study of Zine et al. (2023) introduced a robust method for assessing digital learning readiness, amalgamating ADKAR model with techniques for determining the significance of machine learning-based features. The research involved a survey of 320 faculty members and students at the Faculty of Economics, University of Tlemcen, Algeria, to gather data across the ADKAR model's five components employing decision tree (DT) and random forest (RF) algorithms, the study consistently identified the ability and knowledge as pivotal determinents influencing *e*-learning readiness. Moreover, SHapley Additive exPlanations (SHAP) were utilized to elucidate each variable's impact on the final prediction, underscoring Ability as the most important factor. The research underscores the importance of prioritizing the development of students' skills and equipping them with essential knowledge to strengthen their *e*-learning readiness. It offers valuable insights into the determinants shaping college students' preparedness for engaging in online education.

SATISFACTION AND *E*-LEARNING READINESS

Many researchers have focused on *e*-learning satisfaction and its effectiveness in their studies. James (2021) emphasizes the comprehensive strategy needed for *e*-learning success, including institutional support, technical design, learner computer literacy, behaviors, readiness, and satisfaction. Pham et al. (2019) investigated

e-learning service quality and its impact on student satisfaction and loyalty in Vietnam, highlighting positive outcomes from quality service. Yekefallah et al. (2021) identified a strong link between satisfaction and *e*-learning outcomes during COVID-19 at Qazvin University of Medical Sciences, stressing the need for improved *e*-learning quality. Rajeh et al. (2021) focused on factors influencing satisfaction and sustained intention towards *e*-learning among medical and dental students in Saudi Arabia, underscoring satisfaction's pivotal role. Younas et al. (2022) aimed to enhance Pakistani students' academic performance through increased satisfaction and digital proficiency in online platforms, aiming to optimize learning outcomes amid COVID-19 challenges.

MOTIVATION AND *E*-LEARNING READINESS

Learning is a multifaceted process influenced by instructional methods, technology, learning materials, teachers, and students. Universities continually explore various strategies to enhance educational quality, aiming to develop students' knowledge, skills, and competencies (Tokan, Imakulata, 2019). Motivating students is crucial in improving educational standards (Elshareif, Mohamed, 2021). Baber (2021) conducted a study on 375 South Korean university students, investigating teacher attitude, competence, interaction, student motivation, and technology acceptance model impact on *e*-learning system adoption. The findings highlighted the positive influence of these factors on students' intention to use *e*-learning systems, emphasizing motivation as pivotal. Thongmak (2021) applied self-determination theory (SDT) to 250 employees in Thailand, revealing that employees' motivation indirectly impacts their readiness for lifelong *e*-learning adoption, influenced by autonomy, connectedness, and competence. Institutional readiness also plays a significant role in fostering employee commitment to *e*-learning. Copriady (2015) surveyed 874 Indonesian secondary school teachers, finding motivation to be a key mediator between readiness and ICT integration in teaching. The study recommended governmental support to enhance teachers' motivation through infrastructure, equipment, facilities, and training programs. Motivation significantly influences *e*-learning utilization, impacting educational outcomes positively. Designers should focus on creating engaging, interactive *e*-learning environments to enhance learner motivation and success. Kwateng and Boateng (2022) emphasized user attitude's pivotal role in *e*-learning system success, developing a predictive model integrating personality traits and motivational factors to predict students' practical *e*-learning usage during COVID-19. This highlights the importance of integrating personality and motivational aspects in *e*-learning system design. Ab Rahman et al. (2022) studied students' attributes and their acceptance of technology models, finding positive correlations with motivation, computer proficiency, and perceived usefulness in *e*-learning adoption at Pondok School, Malaysia. Similarly, Bessadok (2022) explored student aspiration factors in Saudi Arabian universities, demonstrating strong correlations between motivation, expectation, pleasure, intent to use, and perceived benefits in enhancing *e*-learning system success.

These studies collectively underscore motivation's critical role in *e*-learning adoption and success, providing insights into fostering positive educational practices and improving learning experiences through effective motivational strategies and technology integration.

RESEARCH MODEL AND HYPOTHESES

The central aim of this study is to explore the effectiveness of ADKAR model in assessing the uptake of *e*-learning among academic professionals within Higher Education Institutions (HEIs).

The hypotheses can be formulated as shown in the proposed model for the study in Figure drawing upon established theoretical frameworks that were formed through the conceptual framework based on previous studies related to the ADKAR model with its five factors in addition to the variable of gender and scientific level, and it is explained as follows (Hiatt, 2006):

H1: *E*-learning motivation is the willingness and desire of learners to participate in online learning activities, to complete tasks and assignments, and to achieve the intended learning outcomes (Ally, Prieto-Blázquez, 2014). Therefore, motivation is expected to have a statistically significant positive impact on the willingness to use digital educational systems.

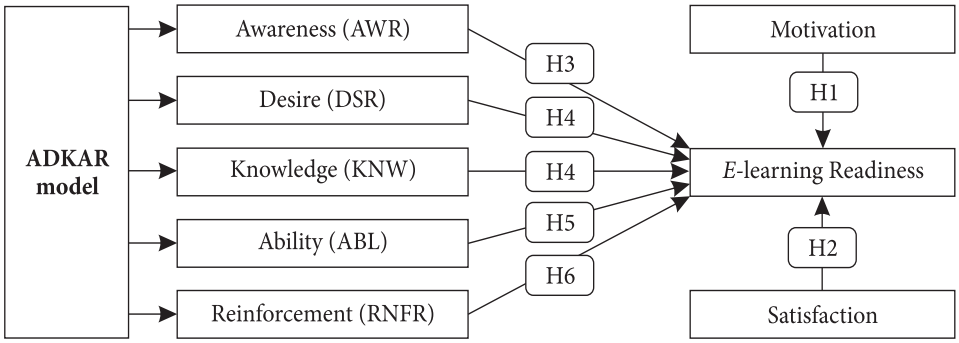
H2: *E*-learning satisfaction pertains to the extent to which learners perceive the quality and effectiveness of the online learning environment and experience to be enjoyable, effective, and useful (Al-Samarraie et al., 2018). Therefore, satisfaction is expected to have a positive statistically significant effect on the readiness to use digital education systems;

H3: Awareness encompasses grasping the essence of change, comprehending its origins, and recognizing the ramifications of its absence. It involves being well-versed in both the intrinsic and extrinsic factors, as well as the benefits that fuel the inclination toward digital education (Hiatt, 2006). Hence, a heightened awareness of change is anticipated to yield a statistically significant, favorable impact on the readiness to adopt digital educational systems;

H4: Desire: The enthusiasm of individuals to endorse and actively engage in change is pivotal for its successful implementation. As per the ADKAR model, enthusiasm represents a personal and subjective decision influenced by individual personality traits and motivations (Hiatt, 2006). Thus, the level of enthusiasm for change is expected to correlate positively and significantly with the readiness to adopt digital education systems;

H5: Knowledge: Understanding the dynamics of change is crucial in education, encompassing the learning and developmental processes involved. This comprehension encompasses insights into processes, behaviors, tools, systems, skills, functions, and methodologies necessary for effective change implementation (Hiatt, 2006). Consequently, possessing this knowledge is anticipated to significantly enhance readiness for adopting digital educational systems;

H6: Ability: It is the degree of achieving or implementing the required change, the ability to transform information into actions (Hiatt, 2006). Therefore, the



Study Model
Sourse: proposed by the authors.

ability to change is supposed to have a significant positive impact on the readiness to use digital education;

H7: Reinforcement: stands as the cornerstone of the ADKAR model, emphasizing vital administrative skills and competencies essential for organizational leaders. These abilities are pivotal in driving successful change initiatives and guiding individuals' behaviors towards the desired objectives (Mudjisusatyo et al., 2024). Therefore, promoting change is supposed to have a statistically significant positive effect on the readiness to use digital education systems.

RESEARCH INSTRUMENTS AND PROCEDURES

To ascertain the status of digital and online education within Algerian universities, extensive data gathering was conducted. This involved semi-structured interviews with a randomly selected sample of 15 participants from various university stakeholders. Subsequently, after thorough content analysis and review of pertinent literature from esteemed international journals, a preliminary questionnaire comprising two sections was devised. The first segment aimed at capturing demographic details such as gender and educational background of the respondents, while the second section focused on 33 questions pertaining to the variables under study.

All answers were mandatory to mitigate the issue of missing values. The validity of its content, the structure of its items, the extent of its readability, and its ambiguity were confirmed after being reviewed by seven experts in methodology and measurement standards, to be tested by conducting an experimental study on an appropriate sample estimated at 49 participants from the University Centre of Maghnia, students and professors, to ensure its reliability and validity. To ensure the precision of the responses, the respondents received an Arabic copy, in both its paper and electronic forms, which numbered 530 respondents, professors, and students from various Algerian universities. All items were calibrated using a five-point Likert scale to enhance differentiation and offer respondents a broader spectrum of options, spanning from (1) strongly disagree to (5) strongly agree.

The researchers analyzed the data, coded it using the SPSS program, and modeled a linear equation using the correlation matrix. They developed a linear regression predictive model for the future of online learning. Additionally, they made recommendations for good management using the ADKAR model. There are several reasons why linear regression may be a better method for our current study:

Firstly, it is reasonable to assume that the ADKAR model variables, motivation, and satisfaction have a unidirectional relationship with the dependent variable of *e*-learning readiness.

Secondly, our primary objective is to investigate the correlations among a limited set of variables. Linear regression effectively highlights the strength and direction of these relationships, allowing us to determine how each independent variable (motivation and satisfaction) influences the dependent variable (*e*-learning readiness).

Lastly, linear regression is a simpler and more straightforward method that can be easily understood and interpreted by a wider audience, making it an effective tool for presenting our study's findings.

RESULTS AND DISCUSSION

To understand the characteristics of the participants, a demographic analysis was conducted followed by obtaining descriptive statistics for the sample. Linear Regression (LR) was employed to test the research hypotheses. LR was deemed appropriate for this study as it aimed to assess the applicability of the ADKAR model in comprehending *e*-learning adoption. The data analysis was performed using IBM SPSS version 25 and PLS SMART version 4.

Demographic analysis. Table 1 shows that males made up the largest portion of respondents, comprising 63.4% of the sample. The sample included 4.9% first-year students, 47% second-year undergraduate students, and 47.2% Master's degree students, with all universities adequately represented. Therefore, the sample can be deemed reasonably representative of the population.

Descriptive statistics. To provide a thorough depiction of the sample, a range of descriptive statistics (means and standard deviations), were computed for each construct.

Table 1. **Demographic profiles of respondents**

%	Frequency	Profile	Characteristic
63.4	336	Male	Gender
36.6	194	Female	
4.9	26	First-year	Academic Qualification
47	249	Second year	
47.2	250	Master's degree	
0.9	5	Professor	

Source: developed by the authors according to: SPSS outputs.

The analysis results displayed in Table 2 reveal that respondents have responded positively to most of the measures related to behavioral intention, as demonstrated by mean values exceeding 3.5 on a 1-5 Likert scale. The standard deviations, all below 1.00, suggest a strong consensus among respondents regarding the concept under evaluation.

Instrument Reliability and Validity. Evaluating the reliability and validity of the measurement tool plays a crucial role in statistical procedure, which aimed at ensuring the precision of content and the coherence of sentences, alongside evaluating their readability and lucidity. This evaluation involves the thorough review of the tool by seven (7) experts proficient in methodology and measurement techniques. Subsequently, a pilot study was undertaken, using an initial survey, with 49 respondents selected from University Center of Maghnia to ensure appropriateness of the sample. As a final stage, and to ensure the effectiveness of the questionnaire in collecting data and achieving the objectives of the study, we meticulously evaluated both the validity and reliability of each scale to fortify the measurement tool's credibility. Our aim is to uphold internal consistency across all statements within the tool, ensuring robustness in our assessments.

Table 2 shows that all Cronbach's alpha values exceeded the required threshold, ranging from 0.67 to 0.85, indicating that all items in the study instrument are reliable as recommended by (Hair et al., 2003)

The measurement scales' validity was evaluated through assessments of convergent and discriminant validity. Convergent validity was gauged using the average variance extracted (AVE), following the guidelines outlined by Fornell and Larcker (1981). A minimum threshold of 0.50 for AVE is typically required to establish convergent validity. Higher AVE values indicate higher convergence and reliability of the regarding the scale of measurement. The results in Table 2 show that all constructs have an AVE greater than 0.5, and their (CR) values (Composite Reliability) surpass the criterion of 0.7. This indicates that there was no overlap between the measures used. Additionally, the AVE for each construct was found to be above the recommended minimum threshold of 0.50, as suggested by (Hair et al., 2016).

The evaluation of discriminant validity, based on the criteria established by Fornell and Larcker (1981), involved examining the correlations between scales

Table 2. **Descriptive statistics & Validity coefficients**

CR > 0.7	AVE > 0.5	Cronbach alpha	SD	Mean	Construct
0.780	0.518	0.854	0.64	3.73	Motivation
0.896	0.530	0.842	0.60	3.87	Satisfaction
0.879	0.580	0.835	0.50	3.90	Awareness
0.880	0.575	0.808	0.68	3.93	Desire DSR
0.864	0.576	0.792	0.65	3.74	Knowledge KNW
0.859	0.555	0.680	0.63	3.66	Ability ABL
0.890	0.580	0.705	0.57	3.72	Reinforcement RNF

Source: developed by the authors according to: SPSS outputs.

and the square root of the Average Variance Extracted (AVE) for each construct, which was a crucial part of our study. Discriminant validity is confirmed when the square root of AVE surpasses the highest correlation value between constructs. Our study findings affirm that all constructs fulfill the discriminant validity criterion, consistent with recommendations by (Hair et al., 2016).

Confirmatory factor analysis. Confirmatory Factor Analysis (CFA) was calculated to validate the measurement model containing ADKAR constructs and their respective reflective measures. The purpose of the CFA was to evaluate the alignment between the proposed theoretical framework and the empirical data collected in the study. It sought to determine if any modifications were needed to ensure accurate measurement estimation. We calculated several model fit indices to assess how well the measurement model fits the data, as detailed in Table 3. These indices were compared to the recommended thresholds by (Hair et al., 2016), all of which showed satisfactory outcomes. This demonstrates the appropriateness of the measurement model for performing the CFA and proceeding with hypothesis testing.

Hypothesis testing and model validation. Overall, the results shown in Table 4 suggest that a majority of participants (90%) showed their willingness and *e*-learning readiness, even in terms of digital skills, with only a small minority scoring in the lowest categories. However, there is still room for improvement, as a significant percentage of participants did not score in the highest category.

Table 3. **CFA Statistics of Model Fit**

Recommended Value	Result Model	Goodness-Fit Indexes
≤ 3.00	1.42	CMIN/df
≥ 0.90	0.961	Goodness-of-fit index (GFI)
≥ 0.90	0.969	Incremental fit index (IFI)
≥ 0.80	0.87	Adjusted goodness-of-fit index (AGFI)
≥ 0.90	0.968	Comparative fit index (CFI)
≤ 0.08	0.03	Root means square error of approximation (RMSEA)

Source: developed by the authors according to: Smart PLS4 outputs.

Table 4. ***E*-learning readiness frequencies**

Percentage, %	Frequencies	*E*-learning readiness	Percentage, %	Frequencies	*E*-learning readiness
0.0	0	Level 1	73.86	390	Level 4
2.85	17	Level 2	15.34	81	Level 5
7.95	42	Level 3			

Source: developed by the authors according to: SPSS outputs.

Table 5 presents the statistical value of the Person correlation coefficients for *e*-learning readiness and the five variables of the ADKAR model, as well as the statistical coefficients of the simple linear regression model. In order to investigate the relationship between the independent variables — Motivation (MTV), Satisfaction (STSF), Awareness (AWR), Desire (DSR), Knowled-ge (KNW), Ability (ABL), and Reinforcement (RNF) — and the dependent variable *e*-learning readiness (ELR).

The findings indicate that the model is significant and predictable, with a significant calculated Fisher value of (233.79), and a strong correlation estimated at (88.8%). The coefficient of determination indicates that the dependent variables explain (78.8%) of the variation in the use of electronic education systems, with the remaining variation being beyond the scope of the study framework. Therefore, the factors used in the proposed model for this study are not sufficient and not the only motives that affect the decision to accept and use digital education in the Algerian university.

The results also reveal that all of the ADKAR variables have a meaningful effect, the model is very effective (Selim, 2019; Brand, 2013; Faishol, Subriadi, 2022) and therefore support all hypotheses. Desire is found to be the most influential element, which can be attributed to the results achieved in the past two years through the courses and lectures provided electronically in light of the exceptional circumstances caused by the COVID-19 pandemic. This is followed by Ability, as most or all of the respondents own smart phones or digital tools and are proficient in using social networking sites and digital education platforms such as Google classroom, Zoom, and Meet, have access to the internet at affordable prices. Knowledge and Awareness rank next, with respondents recognizing the effective role of the teaching staff who did their best to make the two academic seasons a success and their strong insistence on using digital education instead of face-to-face education in order to avoid the epidemic and implement the decisions of the ministry. Reinforcement is found to be the least influential dimension, likely due to the improved health status of the country and reliance on urban education while maintaining *e*-learning as a supporter of knowledge consolidation. Additionally, the state's diversification strategy has recently resorted to mixing both types of education, and the administration lacks direction

Table 5. **Model coefficients and decisions**

Decision	Sig	β	Regression	Sig	Person	Variables
Supported	0.006	0.124	MTV ELR	0.000	0.730	Motivation (MTV)
»	0,000	0,000	STSF ELR	0,000		
»	0.000	0.181	STSF ELR	0.000	0.746	Satisfaction (STSF)
»	0.000	0.239	AWR ELR	0.000	0.675	Awareness (AWR)
»	0.000	0.301	DSR ELR	0.000	0.829	Desire (DSR)
»	0.000	0.288	KNW ELR	0.000	0.829	Knowledge (KNW)
»	0.000	0.293	ABL ELR	0.000	0.841	Ability (ABL)
»	0.000	0.185	RNF ELR	0.000	0.452	Reinforcement (RNF)

Source: developed by the authors according to: SPSS outputs.

toward investment in *e*-learning, which has become a feature of major university institutions that generate significant profits for their countries.

There is a significant correlation between academic motivation and *e*-learning readiness matching and confirming the results of (Baber, 2021; Copriady, 2015; Kaminski, 2022; Thongmak, 2021) so is satisfaction (Kaminski, 2022; Rezaei, Haghani, 2016; Younas et al., 2022; Yekefallah et al., 2021). The own study shows that students who are highly motivated and satisfied with their *e*-learning experience tend to be more successful in their courses and achieve higher academic outcomes. This is because motivated and satisfied students are more likely to actively participate in online discussions, complete assignments on time, and seek out additional resources to enhance their learning. To improve *e*-learning readiness and promote academic motivation and satisfaction, it is important for educators to create engaging and interactive *e*-learning experiences. This can be achieved by using a variety of multimedia tools such as podcasts, videos, and interactive quizzes for enhancing student engagement and participation. Additionally, educators ought to consistently offer feedback and assistance to students to ensure that they are progressing and meeting their learning objectives. This can be achieved through online discussion forums, virtual office hours, and personalized feedback on assignments.

Finally, ensuring students have access to reliable, high-speed internet and that the *e*-learning platform is user-friendly and easy to navigate is crucial. Providing technical support and training for students can also help to alleviate any technical issues and ensure a seamless *e*-learning experience.

The study model equation can be written as follows:

$$ELR = 0{,}239 * AWRi + 0{,}301 * DSRi + 0{,}288 * KNWi + \\ + 0{,}293 * ABLi + 0{,}185 * RNFi + 0{,}181 * STSFi + 0{,}124 * MTVi + ei,$$

where *ei* represents random deviations or errors in the model. These deviations account for the variability in the dependent variable that is not explained by the independent variables.

In our study, we assume that these deviations are normally distributed with a mean of zero and a constant variance. This assumption ensures that the linear regression model provides unbiased and consistent estimates of the parameters.

Based on the results obtained, it can be said that the ADKAR model is an important model that can be used in universities, hospitals, or any other organizations that need to be changed, which confirms the results of all previous studies of this research, such as (Brand, 2013; Ali et al., 2021; Al-Shahrbali, Abdullah, 2021; Zine et al., 2023).

PEDAGOGICAL IMPLICATIONS

This research paper represents a valuable addition to the existing literature on the electronic learning adoption, notable for its simplicity and efficacy. Our study stands as a substantial scholarly contribution to the realm of *e*-learning adoption. The widely recognized ADKAR model, which is a framework for managing change, through a structured and systematic approach to understanding the chal-

lenges and opportunities related to the introduction of *e*-learning in universities especially in developing countries that strive to adopt and apply it, and the paper goes beyond the traditional use of the ADKAR model by adding two behavioral variables that are the motivation and satisfaction, to provide a more comprehensive understanding of the factors influencing the adoption of *e*-learning, and the inclusion of these variables helps reveal the complex and multifaceted nature of *e*-learning adoption and highlight the importance of non-technical factors in the successful *e*-learning adoption in general, the results of the study offer a profound understanding of how to implement *e*-learning effectively and sustainably by directing strategies to overcome barriers to its adoption. These ideas can be applied in other contexts and institutions in developing countries and beyond.

CONCLUSION

This study proposed a theoretical model and, As far as the researchers know, is the first to study the impact of the dimensions and elements of the ADKAR model in addition to two important variables related to mentalities and behaviors, which are satisfaction and motivation to verify the impact of "Awareness AWR, Desire DSR, Knowledge KNW, Ability ABL and Promote Change RNF" on the readiness of Algerian universities to use education systems. The results revealed that the desire for change is the main influencing factor in the readiness to use digital education systems, followed sequentially by the ability to change, knowledge, awareness, and reinforcement. It should be noted that the gender variable has no significant effect on the use of digital education systems. And that there is no significant difference in the perception of users in relation to gender and age, while the educational level has a weak significant effect. This study is very important for decision-makers, universities, service providers, and application developers to improve strategies and motivate families for university professors and students to accept the adoption and sustainability of the use of digital education systems, this may also help other organizations to develop perceptions and strategic plans to manage change and reduce resistance to it. Besides, it will be very helpful to identify the triggers and inhibitors accordingly. For example, raising awareness by developing clear and transparent strategies and providing awareness courses on the importance of *e*-learning in order to reduce the digital gap between the layers of society and developing strategies aimed at educating the public and enhancing user awareness and digital competencies to promote the demand for digital services and eradicate digital illiteracy. Service providers may collaborate with relevant government agencies to implement educational programs, webinars and simulations, and awareness campaigns to increase users' knowledge regarding the risks and benefits of digital education services, particularly for undergraduate students. To achieve individual change, it is better to propose some steps as a systematic framework for managing successful and effective change, starting with anticipating resistance to change while ensuring the necessary and sufficient resources, providing clear care and continuous support by adding assistants for effective training and guidance by communicating with managers and technicians regarding digital education innovations to create «desire in change».

To promote active participation among students, it is recommended that interactive learning experiences be provided, along with facilitating group discussions and projects. Furthermore, teachers should offer regular feedback and support to students, which can effectively boost their motivation and satisfaction. To achieve this, teachers can employ gamification techniques such as badges, leader boards, and rewards, which can encourage collaboration and mutual support among students, while also fostering a supportive environment. It is equally important to continuously improve *e*-learning platforms and courses based on student feedback to enhance motivation and satisfaction.

This study has limitations similar to most other studies. First, selecting a sample that touched a small number of respondents and especially the weak interaction with the online questionnaire could limit the generalizability of the results. Second, this study used tools, measurement methodologies, and variables that have been tested and validated in previous studies. Therefore, it is better for future studies to use measurement scales that are practically commensurate with the privacy of the work and study environment, because the use of different measurement elements in such studies would contribute to verifying the validity and credibility of the proposed model. Data collection can involve conducting interviews and engaging in face-to-face interactions with participants to gather information, especially those with low educational backgrounds because it is more effective in collecting data as compared to questionnaires which provide no opportunity to clear up any ambiguities or doubts. Third, for a deeper understanding of the dynamics of this innovative technology, other variables could be incorporated into future studies such as perceived ease of use, perceived enjoyment, and perceived utility of use, infrastructure, and digital skills.

REFERENCES

Elezi, E., Bamber, C. (2021). Factors Affecting Successful Adoption and Adaption of E-Learning Strategies. In: Enhancing Academic Research and Higher Education with Knowledge Management Principles. P. 19-35. IGI Global. https://doi.org/10.4018/978-1-7998-5772-3.ch002

Lavidas, K., Papadakis, S., Filippidi, A., Karachristos, C., Misirli, A., Tzavara, A. et al. (2023). Predicting the behavioral intention of Greek University faculty members to use Moodle. *Sustainability*, 15(7), 6290. https://doi.org/10.3390/su15076290

Hashem, I., Yaqoob, I., Anuar, N., Mokhtar, S., Gani, A., Khan, S. (2015). The rise of "big data" on cloud computing: Review and open research issues. *Information systems*, 47, 98-115. https://doi.org/10.1016/j.is.2014.07.006

Parlakkilic, A. (2013). E-learning change management: Challenges and opportunities. *Turkish Online Journal of Distance Education*, 14(4), 54-68. URL: https://www.learntechlib.org/p/157276/

Rezaei, H., Haghani, F. (2016). The causes of resistance to change and solutions to overcome it: A review of literature. *Iranian Journal of Medical Education*, 16, 440-453. URL: http://ijme.mui.ac.ir/article-1-3987-en.html

Parlakkiliç, A. (2017). Change management in transition to e-learning system. *Qualitative and Quantitative Methods in Libraries*, 3(3), 637-651. URL: http://www.qqml.net/index.php/qqml/article/view/171

Boua'lak, N. (2014). The role of administrative leadership in consolidating the change process. International Scientific Conference on Change Management in a Changing World. Center for Research and Development of Human Resources. Ramah, Jordan. URL: https://search.mandumah.com/Record/642070

Selim, H. (2019). Educational Change Path. Dar Al-Elm & Al-Eman for publication and distribution. https://doi.org/10.17051/ilkonline.2021.03.283

Hiatt, J., Creasey, T. (2003). Change management: The people side of change. Dulles, Prosci Learning Center. URL: www.change — management.com

Cresswell, K., Bates, D., Sheikh, A. (2013). Ten key considerations for the successful implementation and adoption of large-scale health information technology. *Journal of the American Medical Informatics Association*, 20(e1), e9-e13. https://doi.org/10.1136/amiajnl-2013-001684

Mudjisusatyo, Y., Darwin, D., Kisno, K. (2024). Change management in Independent Campus program: application of the ADKAR model as a change management competency constructor. *Cogent Education*, 11(1), 2381892. https://doi.org/10.1080/2331186X.2024.2381892

Kaminski, J. (2022). Theory applied to informatics — The Prosci ADKAR Model. Editorial. *Canadian Journal of Nursing Informatics*, 17(2). URL: https://cjni.net/journal/?p=10076

Jackson, T. (2019). Differentiated Induction: An Enhanced Model for the New Teacher Induction Program. The Organizational Improvement Plan at Western University, 84. URL: https://ir.lib.uwo.ca/oip/84

Elshareif, E., Mohamed, E. (2021). The Effects of E-Learning on Students' Motivation to Learn in Higher Education. *Online Learning*, 25(3), 128-143. https://doi.org/10.24059/olj.v25i3.2336

Prifti, R. (2022). Self-efficacy and student satisfaction in the context of blended learning courses. Open Learning. *The Journal of Open, Distance and e-Learning*, 37(2), 111-125. https://doi.org/10.1080/02680513.2020.1755642

Ruele, V. (2019). The Localisation of Technology Education Curriculum in Botswana. Explorations in Technology Education Research: Helping Teachers Develop Research Informed Practice, 33-43. https://doi.org/10.1007/978-981-13-3010-0_3

Abdulaziz, Kh. (2017). A proposed vision for overcoming teachers' resistance to change toward implementing quality assurance and accreditation using the ADKAR model. *Journal of Educational Knowledge*, 5(10), 156-80. URL: http://search.mandumah.com/Record/1020422

Adams, D., Sumintono, B., Mohamed, A., Noor, N. (2018). E-learning readiness among students of diverse backgrounds in ont leading Malaysian higher education institution. *Malaysian Journal of Learning and Instruction*, 15(2), 227-256. https://doi.org/10.32890/mjli2018.15.2.9

Blayone, T., Mykhailenko, O., Kavtaradze, M., Kokhan, M., Vanoostveen, R., Barber, W. (2018). Profiling the digital readiness of higher education students for transformative online learning in the post-soviet nations of Georgia and Ukraine. *International Journal of Educational Technology in Higher Education*, 15(1), 1-22. https://doi.org/10.1186/s41239-018-0119-9

Al-Alawi, A., Abdulmohsen, M., Al-Malki, F., Mehrotra, A. (2019). Investigating the barriers to change management in public sector educational institutions. *International Journal of Educational Management.* Vol. 33. No. 1. P. 112-148. https://doi.org/10.1108/IJEM-03-2018-0115

Glegg, S., Ryce, A., Brownlee, K. (2019). A visual management tool for program planning, project management and evaluation in paediatric health care. *Evaluation and program planning*, 72, 16-23. https://doi.org/10.1016/j.evalprogplan.2018.09.005

Faishol, O., Subriadi, A. (2022). Change management scenario to improve Webometrics ranking. *Procedia Computer Science*, 197, 557-565. https://doi.org/10.1016/j.procs.2021.12.173

Arthur-Nyarko, E., Agyei, D., Armah, J. (2020). Digitizing distance learning materials: Measuring students' readiness and intended challenges. *Education and Information Technologies*, 25(4), 2987-3002. https://doi.org/10.1007/s10639-019-10060-y

Zine, M., Harrou, F., Terbeche, M., Bellahcene, M., Dairi, A., Sun, Y. (2023). E-learning readiness assessment using machine learning methods. *Sustainability*, 15(11), 8924. https://doi.org/10.3390/su15118924

James, P. (2021). What Determines Student Satisfaction in an E-Learning Environment? A Comprehensive Literature Review of Key Success Factors. *Higher Education Studies*, 11(3), 1-9. https://doi.org/10.5539/hes.v11n3p1

Pham, L., Limbu, Y., Bui, T., Nguyen, H., Pham, H. (2019). Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam. *International Journal of Educational Technology in Higher Education*, 16(1), 1-26. https://doi.org/10.1186/s41239-019-0136-3

Yekefallah, L., Namdar, P., Panahi, R., Dehghankar, L. (2021). Factors related to students' satisfaction with holding e-learning during the COVID-19 pandemic based on the dimensions of e-learning. *Heliyon*, 7(7). 1-6. https://doi.org/10.1016/j.heliyon.2021.e07628

Rajeh, M., Abduljabbar, F., Alqahtani, S., Waly, F., Alnaami, I., Aljurayyan, A., Alzaman, N. (2021). Students' satisfaction and continued intention toward e-learning: A theory-based study. *Medical education online*, 26(1), 1961348. https://doi.org/10.1080/10872981.2021.1961348

Younas, M., Noor, U., Zhou, X., Menhas, R., Qingyu, X. (2022). COVID-19, students satisfaction about e-learning and academic achievement: mediating analysis of online influencing factors. *Frontiers in psychology*, 13, 948061. https://doi.org/10.3389/fpsyg.2022.948061

Tokan, K., Imakulata, M. (2019). The effect of motivation and learning behaviour on student achievement. *South African Journal of Education*, 39(1). https://doi.org/10.15700/saje.v39n1a1510

Baber, H. (2021). Modelling the acceptance of e-learning during the pandemic of COVID-19. A study of South Korea. *The International Journal of Management Education*, 19(2), 100503. https://doi.org/10.1016/j.ijme.2021.100503

Thongmak, M. (2021). A model for enhancing employees' lifelong learning intention online. *Learning and Motivation*, 75, 101733. https://doi.org/10.1016/j.lmot.2021.101733

Copriady, J. (2015). Self-motivation as a mediator for teachers' readiness in applying ICT in teaching and learning. *Procedia-Social and Behavioral Sciences*, 176, 699-708. https://doi.org/10.1016/j.sbspro.2015.01.529

Osei, H., Kwateng, K., Boateng, K. (2022). Integration of personality trait, motivation and UTAUT 2 to understand e-learning adoption in the era of COVID-19 pandemic. *Education and Information Technologies*, 27(8), 10705-10730. https://doi.org/10.1007/s10639-022-11047-y

Bessadok, A. (2022). Analyzing student aspirations factors affecting e-learning system success using a structural equation model. *Education and Information Technologies*, 27(7), 9205-9230. https://doi.org/10.1007/s10639-022-11015-6

Hiatt, J. (2006). ADKAR: a model for change in business, government and our community. Prosci Inc.

Ally, M., Prieto-Blázquez, J. (2014). What is the future of e-learning? *Journal of Educational Technology Development and Exchange*, 7(1), 1-14. URL: https://www.learntechlib.org/p/149573/

Al-Samarraie, H., Teng, B., Alzahrani, A., Alalwan, N. (2018). E-learning continuance satisfaction in higher education: a unified perspective from instructors and students. *Studies in higher education*, 43(11), 2003-2019. https://doi.org/10.1080/03075079.2017.1298088

Ab Rahman, A., Yasoa, M., Muhamad, S., Abdullah, A., Mohamad, S., Samad, N., Bahari, N. (2022). Acceptance of E-Learning Post-COVID-19: A Case Study on Pondok School Institution. In: The Implementation of Smart Technologies for Business Success and Sustainability: During COVID-19 Crises in Developing Countries. P. 581-594. Cham, Springer International Publishing. https://doi.org/10.1007/978-3-031-10212-7_48

Hair, J., Babin, B., Money, A., Samouel, P. (2003). Essentials of Business Research Methods. New York, John Wiley & Sons Inc.

Hair, J., Hult, G., Ringle, C., Sarstedt, M. (2016). A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). New York, Sage Publications. https://doi.org/10.1007/978-3-030-80519-7

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ВІД ОПОРУ ДО ГОТОВНОСТІ: БАГАТОВИМІРНИЙ АНАЛІЗ ЕЛЕКТРОННОГО НАВЧАННЯ У ВИЩІЙ ОСВІТІ

В умовах стрімких цифрових трансформацій у секторі вищої освіти оцінювання готовності навчальних закладів до впровадження систем електронного навчання стало надзвичайно важливим для забезпечення успіху цих ініціатив і уникнення потенційних проблем, які можуть перешкодити їх реалізації. Вивчено ефективність компонентів моделі ADKAR (усвідомлення, бажання, знання, здатність, закріплення) в оцінюванні готовності алжирських університетів впровадити електронне навчання в системах цифрової освіти. Розглянуто роль мотивації і задово-

лення у впливі на особистісні й поведінкові аспекти 530 студентів і викладачів. Результати свідчать, що 90 % учасників продемонстрували сильну готовність і бажання впровадити електронне навчання. Модель ADKAR виявилася високоефективною в оцінюванні готовності закладів вищої освіти до впровадження електронного навчання, оскільки всі змінні показали значний вплив. Найвпливовішим елементом є бажання, далі йдуть знання, потім усвідомлення, здатність і, нарешті, закріплення змін. Підкреслено, що задоволення і мотивація також справляють значний позитивний вплив. Отримана інформація може значною мірою допомогти в спрямуванні діяльності розробників політики, державних службовців у галузі освіти й викладачів, зацікавлених у впровадженні систем електронного навчання у сфері вищої освіти.

***Ключові слова**: модель ADKAR; алжирський університет; готовність до електронного навчання; мотивація; задоволення.*

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