

PAPER

International Design Standards and Virtual Learning: Investigations of Teachers' Experiences

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ABSTRACT

The study aimed to reveal the consideration degree of the Darsak Educational Platform (DEP) for the International Design Standards (IDS) from teachers' perspectives in Jordan. In addition, it aimed to investigate the relationship between the consideration degree and the variables of teacher's gender, specialization, and classes they teach. To achieve the study objectives, the analytical descriptive method was used, and the study instrument (questionnaire) was developed based on reviewing many IDS, such as QM, SCORM, INACOL, and IEEE-LOM. The questionnaire was distributed after checking its validity and reliability. The study sample consisted of 352 teachers from public schools of the Kasbah District in Amman during the first semester of the school year 2022/2023. The sample study was selected based on the stratified random method. The results showed that the consideration degree of DEP for IDS from teachers' perspectives in Jordan was moderate. Further, findings indicated that there were no statistically significant differences in the consideration degree of DEP for IDS from teachers' perspectives attributable to the variables of teacher's gender, specialisation, and classes they teach. In light of these results, the researchers recommended the need for redesigning and developing DEP in accordance with IDS for the quality of international e-courses. In addition, they suggested periodically reviewing and evaluating the DEP platform every three years as a maximum, as well as conducting further research on the evaluation of the inclusivity and resource availability in DEP as one of the virtual learning environments. These findings imply the need for enhancements in the platform's design to better align with IDS, thereby improving usability, accessibility, and overall effectiveness. Additionally, the lack of differences across demographic variables underscores the importance of adopting universally effective design practices to ensure equitable support for all educators, regardless of their backgrounds or teaching contexts.

KEYWORDS

international design standards, Darsak Educational Platform (DEP), teachers' perspectives, Jordan

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1 INTRODUCTION AND THEORETICAL BACKGROUND

In an era where e-learning has become a cornerstone of global education, ensuring the quality and effectiveness of digital platforms is more critical than ever. The rapid shift towards online learning, accelerated by technological advancements and global challenges such as the COVID-19 pandemic, has underscored the need for educational platforms to adhere to internationally recognised design standards. Such adherence not only enhances usability and accessibility but also ensures that these platforms meet diverse learners' needs and facilitate equitable educational opportunities. This study, focusing on the Darsak Educational Platform (DEP) in Jordan, addresses this global imperative by examining the platform's alignment with International Design Standards (IDS) from the perspective of educators.

Constant and major improvements in information and communication technology (ICT) have greatly facilitated the exchange of knowledge and sped up its spread. To keep up, schools have developed innovative approaches to teaching and learning that better meet students' needs, facilitate the attainment of their goals, and address the emergence of new challenges [49]. Mahdi [25] argues that the proliferation of new scientific and technological tools has provided teachers with a wealth of opportunities to help students develop the specialised knowledge they will need to confront the challenges of the modern world effectively. Due to the unprecedented impact of the global coronavirus pandemic on the education sector in numerous countries, schools have implemented indefinite closures as a measure to reduce the spread of the virus. Because of this, educational institutions actively investigated alternative methods and strategies to improve the teaching and learning process. The key objectives have been to ensure the students' safety and the long-term viability of the educational system.

According to Abdel-Naeem [5], e-learning is a pedagogical approach that facilitates the transmission of information to learners by utilising contemporary communication tools while minimising time and effort. Further, e-learning offers the potential for managing and overseeing the learning process, as well as assessing and gauging learner performance. With the same sense, Al-Atrabi [7] explains that e-learning can be characterised as an educational framework that offers training and educational programs to learners regardless of their location or time constraints, utilising interactive ICTs such as television channels, computers, and the Internet. In addition, distance learning is considered a form of e-learning.

Amer [17] defines distance learning as an educational system that makes it possible for instructors and students to engage in continuous two-way communication via the use of various forms of media. Amer explains that this system is an attempt to help students who may be unable to participate in typical classroom settings due to factors like their location or other commitments. According to Abdel-Majeed and Al-Ani [4], the term distance learning refers to a wide range of methods that can be modified to suit the needs of individual students. The flexibility of distance learning in terms of time and place means that students can maximise their time and resources while still gaining a quality education [13], [32], [40]. This type of education is also characterised by its focus on teaching many students to save time and money, improve teaching quality through constant communication and coordination among the various components of the educational system, and forge a bridge between classroom theory and real-world application using supplementary instructional materials [24], [33].

Among the tools used to implement distance learning are Electronic Educational Platforms (EEP), which are an interactive learning environment that enables

teachers to disseminate lessons and apply educational activities, develop responsibilities through multiple e-techniques, and aid in the exchange of ideas and views among students and teachers, as well as the sharing of scientific content, are used to implement distance learning [10]. It is also defined as an integrated, multi-source interactive educational network that includes e-content to provide courses and educational activities at any time and in any place [11], [34].

One of the most crucial parts of e-learning is the distance learning management system, which allows for the registration and acceptance of students into courses, the administration of tests and assignments, the tracking of students' progress towards completion of courses and certification, and the management of both synchronous and asynchronous forms of communication between instructors and students [19]. They help boost students' motivation by tailoring instruction to everyone's strengths and weaknesses [5], [41]. Its foundation rests on several factors, including technical ones, the capacity to be permanent and secure, the possibility of exchange and validation, and the provision of a wide range of services, such as the creation and administration, of course, materials, lesson plans, and evaluation and tracking mechanisms for individual students [2]. Because EEPs are different from other ways of learning, they have positive effects on learning by making it easier for users to access educational content anywhere and at any time, encouraging ongoing research, and giving students constant access to teachers. That is, they need to be designed and used with a wide range of approaches, principles, and standards.

The most important IDS followed in designing and delivering online learning are Quality Matters (QM). This IDS consists of a set of standards developed by Colty Maters based on the most recent scientific research, educational design principles, and scientific experiments with the goal of continuously developing and improving a collaborative and simplified methodology, with the establishment of QM norms and standards, to aid full course developers, teachers, faculty, and institutions in the design and delivery of online learning [27].

Further, among the most important IDS is the Sharable Content Object Reference Model (SCORM). [29] explains that SCORM is a basic standard protocol for communication between the educational course and the learning management system (LMS). In addition, it is a set of technical standards for e-learning products, which provide communication methods and data models that allow the e-learning content and LMS to work together. Further, it aims for accessibility, adaptability, productivity, operability, and reusability. Furthermore, it includes three main elements, which are the content collection model, the operating environment for the educational units, and browsing and sequencing.

The International Association for Online Learning in Higher Education (AOLHE) was one of the groups that wanted to ensure high-quality online courses, so they published a set of guidelines called the National Standards for the Quality of Electronic Courses. The second edition added 52 sub-standards to complement the five main ones (concerning both content and design): education, grading, technology, curriculum analysis, and help for students. By contributing to the design of professional development and evaluation of online teachers, these standards help ensure high-quality online education programs for students. In summary, AOLHE guidelines outline the knowledge and skills that online teachers should have and be able to demonstrate in an evaluation setting [22].

In addition to the above IDS examples, the IEEE-LOM standards, produced by the Institute of Electrical and Electronics Engineers (IEEE), are among the most important global standards in the development and distribution of online learning. According to IEEE [21], the IEEE Society and the Learning Technology Standards

Committee (LTSC) created these widely adopted guidelines for establishing learning object metadata (LOM). Further, the purpose of these guidelines is to facilitate the creation, distribution, and consumption of educational resources by both teachers and students.

Considering the exceptional health conditions—COVID-19—that Jordan and many other countries around the world have been through, the Jordanian Ministry of Education has been looking for ways to improve the educational process and achieve its goals for various stages and academic levels, particularly considering the recent e-learning boom and the growing demand for high-quality EEP, not to mention the advancement of a pedagogical platform known as DEP that facilitates distance learning using existing information and communication technologies.

Darsak Educational Platform is a free online learning platform supported by the Ministry of Education in Jordan. Through planned and scheduled videos that follow the Jordanian curriculum, it offers instructional lessons to students in the first through high school grades. A prominent elite of teachers presents the DEP learning materials. The primary objectives of DEP are to support students in continuing their education and monitoring their academic progress. According to [18] this platform provides services to both students and teachers such as self-evaluation, asking questions and inquiries, and saving and making all lessons available to enable the student to review the learning materials at any time. Further, it provides the opportunity for teachers to interact with students and track their educational journey. Abu-Zaid [6] demonstrates that DEP allowed students to easily continue their education and make up for the lost time in the classroom by connecting them with teachers and giving them access to a wide range of learning resources designed to inspire and motivate their learning by handing in work, checking in with students, and giving them constructive feedback and suggestions for improvement.

However, Qundeel [50] highlights the challenges Jordanian teachers faced when using digital educational platforms during both face-to-face and distance learning. These challenges stem from limitations in the platforms' design and functionality, which hinder their effectiveness as educational tools. Specifically, the platforms fail to fully meet international standards and best practices for the learning process. Notably, these platforms were not explicitly designed for precise educational purposes in schools but were instead created to facilitate general communication across various societal segments for diverse purposes within the virtual space.

Since the quality assurance of the effective design and implementation of learning and teaching through e-platforms is contingent upon adherence to internationally recognised standards, this requires that the design and implementation of learning and teaching via DEP should be guided by a set of standards that guarantee its efficacy in fulfilling its intended objectives. Thus, this study attempts to investigate the teachers' perspectives on how well DEP measures up to IDS. This study focuses on teachers' perspectives because they play such an integral role in the process of creating, developing, implementing, monitoring, and assessing processes and resources of DEP. Therefore, the main purpose of this research is to demonstrate the extent to which DEP meets IDS from the perspective of Jordanian teachers.

Researchers have paid close attention to the problem of Electronic Educational Platforms (EEP) and the quality they provide. Thus, many studies have addressed this issue from a variety of angles. The following is an overview of related investigations.

Sheets et al. [43] emphasised the QM Rubric as a powerful tool for integrating instructional design best practices, which led to significant course enhancements following a self-review. They advocate for its broader adoption by teaching librarians, collaborative use during QM reviews, and inclusion in online teaching training

for Library and Information Science programs. Similarly, Trivedi et al. [44] evaluated the impact of QM standards on student perceptions of online learning. Their study highlighted that elements such as Course Overview, Learning Objectives, Instructional Materials, Learner Support, and Course Technology were critical to improving student experiences, particularly in content-heavy, core courses for animal science students.

Other studies also underscore the value of QM frameworks. Sanosi [45] explored students' perspectives on QM rubrics and found that while participants agreed with 71% of the standards, they overemphasised areas like privacy and course technology and undervalued accessibility and learner support. AbuKaraki et al. [46] introduced a novel QM-based algorithm for evaluating online course quality, demonstrating its efficiency and positive reception. Smallwood [47] further illustrated how systematic course revisions aligned with QM standards enhanced accessibility and practical use, resulting in improved design and student success through specific updates such as content mapping and clear communication strategies.

Considering the widespread spread of Corona, Al-Sumairat [15] aimed to assess the utility of the DEP for physics education from the perspective of physics teachers in Karak Governorate, Jordan. The study employed a descriptive survey design to evaluate the platform. The findings revealed that all dimensions, including multimedia and student engagement, were rated at a moderate level by the teachers. Additionally, the results indicated no statistically significant differences based on demographic factors such as age, years of experience, education level, or gender. Al-Zahrani [16] conducted a study to evaluate the effectiveness of the Blackboard platform in teaching mathematics during COVID-19, with a focus on quality assurance and accreditation standards from the perspective of faculty members at Umm Al-Qura University in Saudi Arabia. Using a descriptive-analytical approach, the study employed a questionnaire to collect data. The results revealed that the overall effectiveness of the Blackboard platform was moderate, with cloud storage on the platform receiving the highest rating among the four elements examined: the effectiveness of math courses, cloud storage, digital library, and live technical support. Abdelkader and Khalifa [3] aimed to propose the use of digital teaching platforms based on the philosophy of remote learning, as seen from the perspective of faculty members at Al-Azhar University in Egypt. The study employed a descriptive-analytic approach and focused on instructors with basic technical skills. The findings indicated that the activation of teaching platforms played a significant role in the success of the educational process, with a high level of importance attributed to the components of the curricula. Additionally, no statistically significant differences were found between gender and years of experience regarding the effectiveness of the modules in achieving learning outcomes. Al-Rubaie and Habib [14] conducted a study to evaluate a website based on IDS in colleges of education from the perspective of computer course instructors in Iraqi universities. The researchers employed a descriptive approach, and the results revealed a high satisfaction rate of 91%, indicating that the educational website was well-received by computer subject teachers and was designed in accordance with SCORM, a key element of IDS. Graiabhei et al. [20] aimed to evaluate the effectiveness of the Jordanian DEP in serving public school teachers in Amman, considering various factors. The researchers employed a descriptive survey approach by using the platform's evaluation scale to assess its efficacy. The study found that, from the teachers' perspectives, DEP was only moderately effective. Additionally, the results revealed variations in the platform's effectiveness based on gender, favouring males; academic qualifications, favouring those with higher qualifications; and the educational stage, favouring the lower educational stages. Al-Awfi and Al-Sharadqa [8]

conducted a study to assess the effectiveness of the Madrasati platform during the COVID-19 pandemic from the perspective of intellectual disability teachers in Taif Governorate, Saudi Arabia. Using a descriptive analytical method, the study found a high level of effectiveness. Furthermore, there were statistically significant differences in teachers' responses regarding the pros and cons of the Madrasati platform based on gender, with females reporting more favourable views; the educational stage, with the secondary stage teachers showing more positive feedback; and the number of training courses on computers and technology, with those who had attended more than three courses having a more favourable view. However, no significant differences were found regarding the teachers' educational level or years of experience with the Madrasati platform. By reviewing and analysing previous studies, the authors concluded that there are no specific criteria in judging different EEPs in different countries. Specifically, in Jordan, different studies were conducted to evaluate DEP but without a clear review of IDS. As a result, this study is distinguished—as far as the researchers know—as the first study in Jordan that reveals the degree to which DEP meets IDS. Further, it is distinguished by the fact that its sample includes male and female teachers at all educational levels, from the first grade to the twelfth grade, in public schools affiliated with the Kasbah District of Amman. Furthermore, this study is distinguished by the fact that it relies on a clear set of IDS, such as IEEE-LOM, QM, SCORM, and INACOL. These IDS, as mentioned above, include a wide variety of criteria that are needed to carefully evaluate EEP. As a result, the researchers reviewed each of these IDS examples and, using the IDS guidelines, created this research instrument, which was utilised to reveal the main research endeavour of exploring teachers' perceptions on how well DEP corresponds to International Design Standards.

1.1 Study problem and questions

The global spread of COVID-19 has presented a significant obstacle to the educational system's ability to maintain and continue instruction. Considering this crisis, the Jordanian Ministry of Education developed DEP. Then, the revamped DEP will improve and continue the educational process and expand the use of modern digital methods and means to provide learning and teaching. That will allow students to keep up with their studies and make up for any material they may have missed. This platform stands out because of the ways in which it may inspire and empower students to learn through conversation and collaboration. In addition to having full control over their accounts, students on this platform can access their assignments, exams, and feedback [6].

To achieve effectiveness and efficiency in EEP, standards should be considered in the design and production of these platforms. Many studies, such as Jadallah [23], have confirmed that e-learning mechanisms, especially EEP, if they are not designed in a correct way that considers a set of indicators and standards, will not support the educational process, but on the contrary, they may negatively affect learners. Further, several studies, such as Rashid [28] and Al-Jabr [12], have revealed the presence of defects in e-platforms and the lack of approved standards applied when designing these platforms. Furthermore, Al-Falaj [9] also recommended setting rules and standards for designing EEP and emphasised the importance of having standards to ensure the effectiveness of EEP and raise the level of students' classroom interaction and participation.

The results of Tayeh [31] indicated that the reality of students' use of DEP during COVID-19 was to a moderate degree, and that it is necessary to develop this platform

while conducting a continuous evaluation of the platform with the aim of developing it. Further, the results of Tawafsheh [30] indicated that the effectiveness of using DEP was moderate and that it is necessary to develop the electronic content of DEP and activate modern teaching strategies to be compatible with the e-learning curricula on DEP to increase students' interaction with it. Furthermore, it was found that students were hesitant to use DEP due to several factors contributing to their resistance, such as students' lack of preparedness for learning on the platform, shortcomings in the platform's design standards, and teachers' limited digital skills necessary for effective teaching in a virtual environment [42]. Considering the results of these previous studies, DEP currently needs continuous evaluation and investigation to develop it and to increase its effectiveness. Therefore, this study aims to reveal the degree to which DEP meets IDS. Responding to this investigation can explain the difficulty of dealing with this platform and the lack of use.

Through the experience of researchers in the educational field at the Ministry of Education and their observations and listening to the experiences of many teachers and students, they confirmed that students' access to DEP was for the purposes of registering attendance only, without accessing the content they wished to teach to the students. Further, these experiences confirmed that many students were not committed to performing the duties required on DEP and that there was difficulty for some students in accessing it. Furthermore, the experiences confirmed that several technical problems appeared on DEP while taking tests, which led to confusion for students and their parents. The nature of this use of DEP and the difficulties faced by its users emphasises the necessity of evaluating this platform considering the international design standards to ensure its effectiveness in designing and implementing learning and teaching. Therefore, this study came to reveal the consideration degree of DEP for the IDS from teachers' perspectives in Jordan. Further, it came to answer the following questions:

1. To what degree does DEP meet IDS from the teachers' perspectives in Jordan?
2. Are there statistically significant differences at the significance level ($\alpha = 0.05$) between the mean responses of teachers in Jordan related to the degree to which DEP meets IDS from their perspectives due to the variables of teacher's gender, teacher's specialization, and the classes taught by the teacher?

1.2 Study objectives and importance

This study aimed to reveal the degree to which the DEP meets IDS from the teachers' perspectives in Jordan. Further, it aimed to identify statistically significant differences in the estimates of teachers in Jordan related to the degree to which DEP meets IDS from their perspectives due to the variables of teacher's gender, teacher's specialisation, and the classes taught by the teacher.

The importance of this study can be determined as follows: 1) The subject of this study discusses an important educational issue related to the IDS that DEP considers to achieve effective learning. Therefore, this study seeks to reveal the degree to which DEP meets IDS from the teachers' perspectives in Jordan. 2) It is hoped that this study will provide a theoretical framework about the degree to which DEP considers IDS from the teachers' perspectives in Jordan. It also adds to the global library a new type of study related to DEP and the degree to which it considers IDS and fills the knowledge gap in this aspect. 3) The results of this study may contribute to revealing the degree to which DEP meets IDS from the teachers' perspectives in

Jordan to develop it. 4) It is expected that the results of this study will contribute to providing decision-makers in the Ministry of Education with information regarding the degree to which DEP meets IDS and spreading the culture of standards and the necessity of relying on them when designing and developing EEP. 5) It is hoped that this study will contribute to allowing researchers to conduct further research related to IDS that should be considered when designing and developing EEP to ensure their effectiveness.

1.3 Procedural definitions of study terms

Standards: A set of procedures and conditions necessary for adequate production and effective use of educational materials on DEP from teachers' perspectives in Jordan.

IDS: Clauses and phrases formulated in the form of indicators developed by specialized educational organizations or institutions – such as QM, SCORM, INACOL, and IEEE-LOM – which describes the level of quality and control of the distance learning environment, and the design of DEP, which will be used to measure the degree of efficiency of DEP.

DEP: A set of tools that make up DEP that would be used by students and teachers in the Kasbah District of Amman for the continuity of effective learning during the COVID-19. The degree to which DEP considers IDS is measured by the score obtained by the study sample members after their response to the study instrument.

The degree to which meet IDS: It expresses the level of compliance of DEP with IDS from teachers' perspectives in Jordan. These standards are measured by the mean rating that the respondent will receive on the study instrument.

1.4 Research limitations

In conducting this research, the following are the main constraints:

- **Objective limits:** The current study was limited to revealing the degree to which DEP meets IDS from teachers' perspectives in Jordan.
- **Human limits:** A representative sample of basic and secondary school teachers for grades from 1–12 who dealt with DEP was selected.
- **Place limits:** This study was limited to teachers in governmental schools affiliated with the directorates of education in the Kasbah district of Amman.
- **Time limits:** This study was conducted in the first semester of the academic year 2022/2023.

Generalisation of the study results is limited considering the suitability of the instrument and its psychometric properties of validity and reliability.

In addition to the stated limitations, reliance on self-reported data from teachers introduces potential biases that could affect the validity of the findings. Teachers may unintentionally present their experiences in a more favourable light due to social desirability bias, or their perceptions may not accurately reflect the actual effectiveness of the DEP. This reliance on subjective reporting may lead to inconsistencies or overgeneralisations that do not capture the full complexity of the DEP's impact. Another limitation is the potential influence of varying levels of teacher training and digital proficiency on the DEP's effectiveness. Teachers with

more extensive training in digital tools and methodologies may report more positive experiences, whereas those with limited training may struggle and provide less favourable assessments. Similarly, the study does not account for the impact of student familiarity and comfort with digital tools, which could significantly affect the DEP's outcomes. Differences in digital literacy between teachers across the sampled schools might skew the findings, limiting the study's ability to generalise the results to broader contexts or educational systems with varying technological infrastructures and training levels. Addressing these factors in future research could provide a more nuanced understanding of the DEP's effectiveness.

In light of the limitations identified in the current study, future research could address several key areas to enhance the robustness and generalizability of the findings. One important step would be to expand the study population. Future research could include a broader sample of teachers from both public and private schools across various regions of Jordan, rather than focusing solely on the Kasbah district of Amman. This would allow for a more comprehensive understanding of how the DEP is perceived and used in different educational contexts, thereby improving the generalizability of the results. Additionally, including teachers from different grade levels (1–12) and various subject areas would provide a more diverse range of perspectives on the platform's effectiveness.

Another critical area for future research would be to use a mixed-methods approach. The current study relied solely on self-reported data, which can be subject to biases such as social desirability bias. To address this, future studies could combine quantitative surveys with qualitative methods, such as interviews or focus groups, to gather more in-depth insights from teachers. This mixed-methods approach would help reduce the limitations of relying solely on self-reporting and provide a richer understanding of teachers' experiences with the platform, revealing potential challenges that quantitative data alone might not capture.

In addition, accounting for teacher training and digital proficiency is essential for future research. One key limitation of the current study is the variation in teachers' digital competence and training, which could influence their perceptions of the platform. Future studies could categorize teachers based on their levels of digital proficiency and examine whether their experiences with the DEP differ depending on their comfort and familiarity with digital tools. This would provide a clearer picture of how training and technical skills impact the effectiveness of the platform.

Future research should also incorporate student feedback to complement teachers' perspectives. While this study focused on teachers' views, students' experiences with the DEP are equally important, as their interactions with the platform directly affect learning outcomes. Understanding students' familiarity and comfort with digital tools could significantly impact the platform's perceived effectiveness. Collecting both teacher and student feedback would provide a more holistic view of the platform's strengths and weaknesses, offering valuable insights into its overall impact.

A further direction for future studies would be to adopt a longitudinal study design. A longitudinal approach would allow researchers to observe the long-term effects of DEP on teaching practices and student learning outcomes. It would also enable researchers to monitor how teachers' attitudes and experiences with the platform evolve over time, particularly as they gain more experience and training. This would provide a deeper understanding of how the platform influences educational practices in the long run.

Lastly, addressing the psychometric properties of the instrument used in this study is crucial for future research. While the instrument was deemed reliable and valid, further research could investigate its psychometric properties in different

educational settings to ensure that it accurately measures the intended outcomes. This would help confirm the validity of the findings and ensure that they can be generalised to broader teacher populations and educational contexts.

By addressing these limitations, future studies could provide a more comprehensive and nuanced understanding of the DEP's impact, offering valuable insights for improving the platform and ensuring its effectiveness in enhancing teaching and learning outcomes.

2 METHODOLOGY AND PROCEDURES

The descriptive analytical approach was used to reveal the degree to which DEP meets IDS from teachers' perspectives in Jordan. This approach is appropriate for the aims of the research.

2.1 Study community and sample

The study community consists of 4,052 teachers from public schools in the Kasbah District of Amman who used the DEP during the 2022/2023 academic year. To ensure a representative sample, the study selected a total sample size of 352 teachers. This sample was chosen using the stratified random sampling method, which ensures that different subgroups (such as teacher gender, specialisation, and the classes taught) are adequately represented [1]. Table 1 illustrates the distribution of the study sample members across these key variables, ensuring that the sample reflects the diversity of the teacher population within the study community. This sampling approach enhances the validity and generalizability of the study's findings.

Table 1. Distribution of study sample according to study variables

Variables	Category	Count	Percentage
Gender	Male	127	36%
	Female	225	64%
	Total	352	100%
Specialization	Humanitarian	247	70%
	Scientific	105	30%
	Total	352	100%
Classes taught by the teacher	1–6	137	39%
	7–10	109	31%
	11–12	106	30%
	Total	352	100%

2.2 Study instrument

To strengthen the study's rigour, the researchers began by reviewing established IDS for e-course quality from multiple reputable sources [27], [29], [22], [21]. These standards provided the foundational framework for constructing the questionnaire.

Additionally, the researchers conducted an in-depth review of relevant literature and previous studies, such as those by Jadallah [23] and Graiabhei et al. [20], to ensure the questionnaire items aligned with current research and best practices in evaluating e-course quality.

The development process included creating an initial draft of the questionnaire, which consisted of two parts: demographic data and classification variables in the first section and 52 items measuring the degree to which DEP meets IDS in the second section. The items were distributed across eight main areas of focus. To validate the questionnaire, the researchers sought input from 14 experienced arbitrators, including faculty members specialising in curriculum, instruction, and educational technology, as well as supervisors from the Ministry of Education. These experts evaluated the items for linguistic clarity, ease of understanding, relevance to the target group, and alignment with the study's objectives. Their feedback led to the refinement of several items, ensuring that the final version met a consensus standard of approximately 80% agreement. Moreover, the researchers conducted a pilot test with a sample of 30 teachers, not included in the main study, to assess the internal consistency and reliability of the items, confirmed using Cronbach's alpha. This comprehensive process ensured that the survey was both valid and reliable, enhancing the credibility of the study findings.

In this study, the researchers used a five-point Likert scale (very high degree, high moderate, low degree, and very low degree), with all items having a positive valence. The researchers reached an objective judgement based on the mean responses of the sample population. The following category scale was adopted: very high is (4.21–5.00), high is (3.41–4.20), moderate is (2.61–3.40), low is (1.81–2.60), and very low is (1.00–1.80). After applying some statistical analysis, the researcher was able to get an objective assessment of the sample's mean answer by using the range's length.

2.3 Validity and reliability

To verify the apparent validity of the questionnaire, it was presented, in its initial form, to 14 experienced and specialised arbitrators from faculty members at Jordanian universities in the specialisation of curriculum and instruction and educational technology and supervisors from the Ministry of Education. These experts expressed their opinions on the questionnaire items in terms of linguistic integrity, clarity, ease of understanding, suitability to the area to which they belong, and suitability for the target group.

Considering the arbitrators' comments, the proposed amendments were made to the questionnaire, including reformulating some of them to become clearer. The criterion that was adopted in accepting or excluding the items was that the items obtained the consensus of the arbitrators at a rate close to (80%). Thus, the number of items in the questionnaire after the arbitration remained (52) distributed over eight areas: 1) introduction which includes the items of (1–13), 2) learning outcomes which includes the items of (14–18), 3) measurement and evaluation which includes the items of (19–24), 4) educational materials which includes the items of (25–31), 5) course activities and learner interaction which includes the items of (32–36), 6) techniques which includes the items of (37–42), 7) learner support which includes the items of (43–47), and 8) access and use which includes the items of (48–52).

Cronbach's alpha was used to determine internal consistency on a survey sample of 30 teachers who were not included in the study sample. Table 2 shows these coefficients.

Table 2. Reliability coefficient values for the research instrument and its areas

Area	Cronbach Alpha
Measurement and evaluation	0.95
Learner support	0.95
Introduction	0.93
Educational materials	0.93
Techniques	0.92
Learning outcomes	0.89
Access and use	0.89
Course activities and learner interaction	0.88
Total	0.96

Table 2 shows that the Cronbach alpha values, which measure the reliability of a measurement's internal consistency, ranged from 0.88 to 0.95 across all areas. Overall, the scale has an internal consistency coefficient of around 0.96. These coefficients of reliability are all suitable for the needs of this investigation [26].

2.4 Ethical concerns

The researchers took comprehensive measures to ensure informed consent by clearly communicating the purpose, scope, and implications of the study to all participants. Participants were fully informed about how their data would be used, their right to withdraw at any time, and any potential risks or benefits associated with their involvement. To ensure voluntariness, the researchers emphasised that participation was entirely optional, and declining to participate would have no negative consequences.

To safeguard data privacy, the researchers thoroughly anonymised all data to prevent the disclosure of any identifiable information in the study's findings or reports. Participants were also informed about the data storage and access procedures, including the duration for which their data would be retained. Regarding potential biases in survey responses, the researchers designed the questionnaire to minimise social desirability bias by ensuring anonymity and a non-evaluative approach. They also made efforts to ensure that the sample was representative of the teacher community in terms of demographics, specialisations, and teaching contexts. Moreover, the questionnaire underwent expert review to enhance its validity and reliability.

2.5 Study variables and statistical treatments

The study included two types of variables. First, the classification variables which are the gender of the teacher (male, female), the teacher's specialties (humanistic, scientific), and the class taught by the teacher (1–6, 7–10, 11–12). Second, the dependent variable which is the degree to which DEP meets IDS from the teachers' perspectives in Jordan.

To answer the study questions, several statistical treatments were used: 1) means and standard deviations to answer the first and second questions, and 2) Three-way ANOVA to answer the second question.

3 RESULTS AND DISCUSSION

3.1 First question

The first question is: “To what degree does DEP meet IDS from the teachers’ perspectives in Jordan?” To answer this question, means and standard deviations of the participants’ responses were calculated based on the questionnaire’s areas. Table 3 shows the results.

Table 3. Means and standard deviations of the study areas

Rank	Area	Mean	SD	Degree
1	Introduction	2.98	0.84	Moderate
2	Access and use	2.96	0.89	Moderate
3	Learning outcomes	2.92	0.87	Moderate
4	Educational materials	2.83	0.83	Moderate
5	Techniques	2.77	0.79	Moderate
6	Learner support	2.74	0.81	Moderate
7	Measurement and evaluation	2.71	0.92	Moderate
8	Course activities and learner interaction	2.58	0.93	Low
Total		2.83	0.72	Moderate

Table 3 indicates that the arrangement of the areas of the study instrument was as follows: 1) The first area, “Introduction,” ranked first ($M = 2.98$, $SD = 0.84$) with a moderate degree; 2) the eighth area, “Access and Use,” ranked second ($M = 2.96$, $SD = 0.89$) with a moderate degree. 3) The second area, “Learning Outcomes,” ranked third ($M = 2.92$, $SD = 0.87$) with a moderate degree. 4) The fourth area, “Educational Materials,” ranked fourth ($M = 2.83$, $SD = 0.83$) with a moderate degree. 5) The sixth area, “Techniques,” ranked fifth ($M = 2.77$, $SD = 0.79$) with a moderate degree. 6) The seventh area, “Learner Support,” ranked sixth ($M = 2.74$, $SD = 0.81$) with a moderate degree. 7) The third area, “Measurement and Evaluation,” ranked seventh ($M = 2.71$, $SD = 0.92$) with a moderate degree. 8) The fifth area “Course Activities and Learner Interaction,” ranked eighth ($M = 2.58$, $SD = 0.93$) with a low degree. Further, the table indicates that the overall degree of the participants’ responses ($M = 2.83$, $SD = 0.72$) was moderate.

As indicated in Table 3, the item “course activities and learner interaction” ranked “low” when compared to the other items. This finding could be related to DEP’s inadequacy in providing appealing course activities that could drive learners to interact and engage in the learning process provided by DEP. This component should be considered in the upcoming DEP evaluation to boost learner interactions. Furthermore, this finding could be linked to a lack of training for learners prior to the introduction of this online platform. The researchers attribute the other moderate results in Table 3 to the recent experience with this new type of online learning platform. The design and use of DEP came suddenly and urgently, without preparation or training for all elements of the new online educational system, due to the health conditions that Jordan experienced during the COVID-19 pandemic. The transition to learning through this platform was rapid without the ability to obtain feedback from the educational field. Further, these results can be attributed to either the Ministry of

Education's lack of specific standards for creating EEP and e-courses or the educational administrators' insufficient knowledge of the IDS guidelines when they were assigned to design this e-learning platform. In addition, these results may be because this platform was produced and developed by technicians who lacked the skills to design EEP and e-courses in accordance with IDS, or that they did not receive training workshops to help them learn about necessary standards for designing EEP considering international trends. Furthermore, such results can be attributed to the lack of financial capabilities to contract with international companies' expert in designing EEP in accordance with IDS for the quality of e-courses to design DEP in the optimal way.

As far as researchers are aware, this current study is the only study that addressed the issue of the extent to which DEP meets IDS. Accordingly, there are no current studies—with the same variables—whose results indicate agreement or disagreement with them. The results of this study are consistent with the results of Al-Sumairat [15]—despite the difference with them in some variables—that all areas of evaluating the quality of DEP from the perspectives of physics teachers in Karak Governorate came with a moderate degree. That is, there is a moderate degree of effectiveness of DEP dimensions, which include learner interaction and achieving learning outcomes. Specifically, Al-Sumairat found that the utility of DEP dimensions (multimedia, student engagement) were moderate from the perspective of physics teachers in Karak Governorate in Jordan. That is, both of the studies highlight a need to improve the DEP dimension related to learners' interaction.

The results of this study differ—despite the difference in some variables—from Al-Rubaie and Habib [14], whose results showed that the educational website designed according to SCORM, which was evaluated by computer teachers, gained their acceptance. That is, there is a high degree of consideration for SCORM standards in the design of this website. This disagreement in the result could be attributed to the fact that the researchers in this study developed a comprehensive survey based on many IDS such as QM, SCORM, INACOL, and IEEE-LOM. So, the results came out differently when you look from a wider lens of IDS.

The following tables show the means and standard deviations of the study sample's responses to the items in the eight areas:

The first area “Introduction”. Means and standard deviations of the study sample's responses were extracted as shown in Table 4.

Table 4. Means and standard deviations of the first area “Introduction”

No.	Item	Means	SD	Rank	Degree
3	DEP introduces the learner to the general objective of the course.	3.19	1.01	1	Moderate
1	DEP provides clear instructions on how to start working with the course	3.12	1.02	2	Moderate
2	DEP provides clear instructions on accessing the course's various components.	3.10	0.98	3	Moderate
4	DEP introduces the learner to the structure of the course.	3.09	1.03	4	Moderate
7	DEP clarifies the course policy that the learner should comply with by displaying it in the course or providing a link to it.	3.00	0.99	5	Moderate

(Continued)

Table 4. Means and standard deviations of the first area “Introduction” (Continued)

No.	Item	Means	SD	Rank	Degree
9	DEP shows the technical usage instructions that the learner should adhere to.	2.98	0.99	6	Moderate
10	DEP pre-clears the general controls and instructions that the learner should adhere to.	2.97	1.01	7	Moderate
11	DEP explains the minimum technical skills that the learner should have.	2.97	1.05	8	Moderate
12	DEP provides a suitable and clear definition of the course teachers electronically.	2.91	0.96	9	Moderate
8	DEP specifies the minimum technical requirements (hardware and software) that the learner should have.	2.88	1.05	10	Moderate
6	DEP shows the school policy that the learner should comply with by displaying it in the course or providing a link to it.	2.87	1.04	11	Moderate
5	DEP provides clear information about the policy of electronic communication in all its forms, such as discussions and e-mail correspondence.	2.86	1.06	12	Moderate
13	DEP includes an educational activity that aims to provide learners with the opportunity to introduce themselves to their colleagues.	2.79	1.11	13	Moderate
	Total	2.98	0.84		Moderate

Table 4 demonstrates that the means of the items in the first area ranged between 2.79 and 3.19. Further, item 3, which states, “DEP introduces the learner to the general objective of the course,” came in the first rank ($M = 3.19$, $SD = 1.01$), with a moderate degree. However, item 13, which states, “DEP includes an educational activity that aims to provide learners with the opportunity to introduce themselves to their colleagues,” came in the last rank ($M = 2.79$, $SD = 1.11$), with a moderate degree. Furthermore, the overall degree of this area ($M = 2.98$, $SD = 0.84$) was moderate.

These findings highlight a critical gap in the effectiveness of interactive mobile technologies in education, particularly with platforms such as DEP. The moderate scores could reflect teachers’ limited familiarity with the platform and its features, which is often the case when platforms are used sporadically or under emergency circumstances. This underscores the importance of continuous engagement with such platforms for both educators and learners. The lack of clear instructions on how to use the platform, coupled with an absence of guidance on achieving learning outcomes, points to a broader challenge in the design of interactive mobile learning environments. These platforms must not only provide content but also facilitate seamless navigation, support user interaction, and offer clear, accessible instructions to maximise educational value.

Furthermore, the absence of links to external information sources that can supplement the course content represents a significant limitation. Interactive mobile technologies, especially in education, thrive when they can integrate resources from diverse external sources, enabling learners to explore topics more deeply and apply their knowledge in real-world contexts. This is particularly relevant in the age of mobile learning, where engagement and access to supplementary materials can significantly enhance learning outcomes.

These findings contribute to the broader field of interactive mobile technologies in education by emphasising the importance of user-centred design. Platforms like DEP, which are central to mobile learning initiatives, must focus on improving usability through clear instructions and enhanced features, such as links to external resources, to foster deeper engagement and better learning outcomes. This aligns with previous studies, such as Al-Sumairat's [15], which found that the overall evaluation of DEP was also moderate, suggesting that all aspects of the platform require further investigation and refinement. The study's results highlight the need for continuous development in interactive mobile platforms to create more effective and user-friendly educational experiences for both teachers and learners.

The second area "Learning Outcomes". Means and standard deviations of the study sample's responses were extracted as shown in Table 5.

Table 5. Means and standard deviations of the second area "Learning Outcomes"

No.	Item	Means	SD	Rank	Degree
16	DEP explains all learning outcomes in a clear and specific manner and according to the learner's needs.	2.98	0.98	1	Moderate
18	DEP formulates learning outcomes consistent with the course level.	2.93	0.96	2	Moderate
15	DEP describes the learning outcomes of the units/lessons that are consistent with the overall course objectives in a measurable way.	2.93	1.02	3	Moderate
17	DEP develops learning activities in harmony with the learning outcomes.	2.89	1.01	4	Moderate
14	DEP describes the general learning outcomes of the course in a measurable way.	2.87	0.99	5	Moderate
	Total	2.92	0.87		Moderate

Table 5 reveals that the means of the items in the second area ranged between 2.87 and 2.98. Further, item 16, which states, "DEP explains all learning outcomes in a clear and specific manner and according to the learner's needs," came in the first rank ($M = 2.98$, $SD = 0.98$), with a moderate degree. However, item 14, which states, "DEP describes the general learning outcomes of the course in a measurable way," came in the last rank ($M = 2.87$, $SD = 0.99$), with a moderate degree. Furthermore, the overall degree of this area ($M = 2.92$, $SD = 0.87$) was moderate.

These findings have important implications for the broader context of interactive mobile technologies in education. The moderate effectiveness in explaining learning outcomes may reflect the challenges inherent in platforms that attempt to serve diverse learners with varying needs, especially in the absence of direct, real-time interaction between students and instructors. While the platform's reliance on pre-recorded video clips and textbooks allows for the clear definition of outcomes, this static form of delivery may limit the depth of personalized learning, a crucial element in the effectiveness of mobile learning technologies.

Interactive mobile technologies in education are often lauded for their potential to provide adaptive learning experiences, which are difficult to achieve in a one-size-fits-all model. In this study, the challenge lies in determining learning outcomes that require more than just a static presentation of information. Certain outcomes, particularly those requiring hands-on activities or specialised technologies, such as virtual labs or simulations, are not supported by the platform. This gap highlights

the need for more dynamic, interactive mobile solutions that integrate tools capable of providing real-time feedback, personalised learning paths, and more immersive learning experiences. Thus, these findings contribute to the ongoing discourse on the limitations and potential of mobile learning platforms, underscoring the importance of advancing interactive features that can meet the diverse needs of learners in a digital age.

The third area “Measurement and Evaluation”. Means and standard deviations of the study sample’s responses were extracted as shown in Table 6.

Table 6. Means and standard deviations of the third area “Measurement and Evaluation”

No.	Item	Means	SD	Rank	Degree
19	The assessment tools used in the DEP measure specific learning outcomes.	2.81	1.01	1	Moderate
20	DEP clearly defines the grading policy.	2.75	1.05	2	Moderate
21	DEP provides the learner with performance evaluation criteria.	2.74	1.07	3	Moderate
22	DEP provides a sufficient description of the performance evaluation criteria and their relationship to the grading policy.	2.68	1.03	4	Moderate
23	DEP provides the learner with specific assessment tools that are gradual, diverse, and appropriate.	2.66	1.05	5	Moderate
24	DEP provides learners with various opportunities to track their progress in the course.	2.65	1.06	6	Moderate
	Total	2.71	0.92		Moderate

Table 6 shows that the means of the items in the third area ranged between 2.65 and 2.81. Further, item 19, which states, “The assessment tools used in the DEP measure specific learning outcomes,” came in the first rank ($M = 2.81$, $SD = 1.01$), with a moderate degree. However, item 24, which states, “DEP provides learners with various opportunities to track their progress in the course,” came in the last rank ($M = 2.65$, $SD = 1.06$), with a moderate degree. Furthermore, the overall degree of this area ($M = 2.71$, $SD = 0.92$) was moderate.

These results suggest key limitations in the DEP’s use of assessment tools, which are central to its role as an interactive mobile learning platform [48]. Specifically, the teachers’ lack of confidence in the mechanisms for test submission—concerns regarding test integrity and student accountability—highlights a gap in the platform’s support for secure and personalised assessment methods. This limitation is particularly significant in the broader context of interactive mobile technologies in education, where secure, adaptive, and learner-centred assessments are critical for both the accuracy of evaluation and the engagement of students.

Moreover, the teachers’ concerns about the uniformity of assessments—where tests do not account for individual differences—further emphasise the need for more tailored, adaptive learning environments. In the context of mobile technologies, personalised learning paths and differentiated assessments can be crucial for accommodating diverse learner needs and ensuring that each student is evaluated in accordance with their abilities. This issue, along with the lack of gradual evaluation methods that measure progress over time, points to the necessity for integrating adaptive learning technologies that can monitor and assess individual progress in a more nuanced, step-by-step manner.

These findings contribute to the broader field of interactive mobile technologies in education by illustrating the importance of integrating secure, adaptive, and personalised assessment tools within digital learning platforms. Enhancing the ability of platforms like DEP to track and evaluate students' progress in a way that aligns with their unique learning needs could significantly improve both the reliability and the engagement of mobile learning experiences.

The fourth area "Educational Materials". Means and standard deviations of the study sample's responses were extracted as shown in Table 7.

Table 7. Means and standard deviations of the fourth area "Educational Materials"

No.	Item	Means	SD	Rank	Degree
25	DEP provides educational materials that contribute to achieving the specific learning outcomes of the course.	2.91	0.96	1	Moderate
28	DEP appropriately documents all educational materials used in the course.	2.90	0.97	2	Moderate
27	DEP explains how to use educational materials to achieve learning outcomes.	2.86	0.93	3	Moderate
26	DEP determines the purpose of using educational materials to achieve learning outcomes.	2.86	0.93	3	Moderate
29	DEP uses various educational materials in the course.	2.79	0.97	4	Moderate
30	DEP uses modern educational materials in the course.	2.77	0.99	5	Moderate
31	DEP explains the difference between necessary and optional educational materials.	2.71	0.96	6	Moderate
	Total	2.83	0.83		Moderate

Table 7 demonstrates that the means of the items in the fourth area ranged between 2.71 and 2.91. Further, item 25, which states, "DEP provides educational materials that contribute to achieving the specific learning outcomes of the course," came in the first rank ($M = 2.91$, $SD = 0.96$), with a moderate degree. However, item 31, which states, "DEP explains the difference between necessary and optional educational materials," came in the last rank ($M = 2.71$, $SD = 0.96$), with a moderate degree. Furthermore, the overall degree of this area ($M = 2.83$, $SD = 0.83$) was moderate.

These findings highlight key limitations in the DEP that reflect broader challenges in the integration of interactive mobile technologies in education. First, the educational materials in DEP fail to achieve the full range of specified educational outcomes and lack sufficient explanation or context, which limits their pedagogical effectiveness. In the context of interactive mobile technologies, effective educational platforms should prioritise personalised learning by adapting content to the learners' needs, abilities, and interests. The absence of optional, self-directed materials in DEP contrasts with the growing trend of adaptive learning technologies that empower students to choose content based on their preferences and capabilities, making learning more engaging and relevant to each individual.

Furthermore, the lack of trust in the test submission process, particularly regarding the integrity of assessments, underscores a critical challenge in digital education systems. Interactive mobile technologies in education have the potential to incorporate advanced features such as secure exam proctoring and personalised assessments, which could alleviate teachers' concerns about test security and authenticity. The absence of these technologies in DEP highlights a gap in ensuring the integrity

and credibility of assessments, which is essential for maintaining the quality of education in digital learning environments.

Lastly, the findings regarding the one-size-fits-all approach to assessments, particularly the use of multiple-choice questions, reveal the need for more differentiated, formative assessment methods in mobile learning platforms. In contrast to traditional approaches, interactive mobile technologies allow for more nuanced, ongoing assessments that account for individual learning progress. Incorporating tools for continuous assessment and feedback would better cater to diverse learning styles and abilities, ensuring that all students have the opportunity to succeed and meet learning outcomes at their own pace. These findings contribute to the broader field of interactive mobile technologies in education by emphasising the importance of personalised, secure, and adaptive learning experiences that better align with the diverse needs of learners.

The fifth area “Course Activities and Learner Interaction”. Means and standard deviations of the study sample’s responses were extracted as shown in Table 8.

Table 8. Means and standard deviations of the fifth area “Course Activities and Learner Interaction”

No.	Item	Means	SD	Rank	Degree
32	Learning activities encourage the achievement of specified learning outcomes.	2.63	1.02	1	Moderate
33	Educational activities provide opportunities for interaction, which supports active learning.	2.59	1.10	2	Low
36	DEP clearly defines learner interaction requirements.	2.55	0.02	3	Low
34	DEP introduces the learner to the ways the teachers communicate and interact with learners and responds to their feedback.	2.55	1.05	4	Low
35	DEP introduces the learner to how the teacher provides feedback on assignments.	2.51	1.99	5	Low
	Total	2.58	0.93		Low

Table 8 reveals that the means of the items in the fifth area ranged between 2.51 and 2.63. Further, item 32, which states, “Learning activities encourage the achievement of specified learning outcomes,” came in the first rank ($M = 2.63$, $SD = 1.02$), with a moderate degree. However, item 35, which states, “DEP introduces the learner to how the teacher provides feedback on assignments,” came in the last rank ($M = 2.51$, $SD = 1.99$), with a low degree. Furthermore, the overall degree of this area ($M = 2.58$, $SD = 1.99$) was low.

These findings are pivotal, particularly in the context of the broader trends in interactive mobile technologies in education. When participants rated items related to “course activities and learner interaction” poorly, it suggested that the DEP is not adequately aligned with IDS in fostering meaningful learner interaction. This deficiency is especially significant in an era where mobile learning technologies are expected to facilitate active, engaged, and personalised learning experiences. The limited role of teachers in DEP, where they primarily assign daily duties, reduces the potential for interactive and dynamic learning. This trend reflects a broader challenge in the field of mobile education technologies, where platforms often fail to incorporate sufficient interactivity and real-time teacher-student communication, crucial for promoting engagement and critical thinking.

The findings that students primarily use the platform for attendance purposes, rather than engaging in the full range of assignments, underscore the problem of

passive consumption in distance learning. This passive engagement is a key issue with many educational platforms, particularly in mobile learning environments, where the lack of real-time sensory feedback and face-to-face interaction diminishes opportunities for hands-on learning, collaboration, and effective participation. As mobile technologies in education continue to evolve, ensuring that these platforms actively support engagement through interactive activities and practical applications becomes essential. The findings also emphasise the need for platforms to integrate tools that facilitate real-time feedback, collaborative learning, and student participation—core elements of effective mobile learning experiences.

The medium level of interaction in DEP can be partially explained by the lack of diversity in course activities, which are critical for maintaining student engagement. This aligns with broader concerns in the field of mobile learning, where a lack of variety in digital learning activities can lead to disengagement. By incorporating more diverse, interactive, and exciting activities, DEP could foster greater student involvement and active learning. Active learning, especially in the context of mobile and interactive technologies, hinges on students' ability to receive constructive feedback and interact with the content in meaningful ways. Without these features, mobile learning platforms risk becoming passive tools rather than active learning environments.

Moreover, the lack of confidence in the DEP's test submission system and integrity further highlights the gap in ensuring robust assessment methods within mobile learning platforms. Secure, fair, and personalised assessments are vital in the context of interactive technologies, where platforms should allow for customised evaluations that consider students' unique needs and abilities. The absence of such features in DEP reflects a broader challenge in mobile learning environments, where platforms often fail to provide adaptive assessments that cater to diverse learner profiles.

These findings contribute to the field of interactive mobile technologies in education by highlighting key limitations in current platforms, such as insufficient interactivity, lack of personalised learning pathways, and challenges in assessment integrity. Addressing these issues could significantly enhance the effectiveness of mobile learning technologies, promoting deeper engagement, personalised learning experiences, and more accurate assessments that reflect individual student progress.

The sixth area “Techniques”. Means and standard deviations of the study sample's responses were extracted as shown in Table 9.

Table 9. Means and standard deviations of the sixth area “Techniques”

No.	Item	Means	SD	Rank	Degree
39	The technical requirements for the course are simple to use.	2.83	0.97	1	Moderate
41	The technologies used in the course are modern.	2.82	0.89	2	Moderate
37	The tools used in the course support the identified learning outcomes.	2.82	0.91	3	Moderate
40	Technical requirements for the course are easy to meet.	2.74	0.92	4	Moderate
38	Course tools encourage student participation and active learning.	2.70	0.96	5	Moderate
42	DEP provides links to the usage policy for all external tools required in the course.	2.69	0.95	6	Moderate
	Total	2.77	0.79		Moderate

Table 9 demonstrates that the means of the items in the sixth area ranged between 2.69 and 2.83. Further, item 39, which states, “The technical requirements for the course are simple to use,” came in the first rank ($M = 2.83$, $SD = 0.97$), with a moderate degree. However, item 42, which states, “DEP provides links to the usage policy for all external tools required in the course,” came in the last rank ($M = 2.69$, $SD = 0.95$), with a moderate degree. Furthermore, the overall degree of this area ($M = 2.77$, $SD = 0.79$) was moderate.

These findings underscore the crucial role that interactive mobile technologies play in enhancing educational experiences, particularly in the context of e-learning platforms like the DEP. The limited effectiveness of DEP in fostering meaningful interaction between teachers and students highlights a significant gap in the platform’s design. Effective e-learning, especially through mobile platforms, thrives on providing creative, engaging, and interactive learning experiences. However, DEP’s current limitations, such as inadequate communication methods and lack of ease in accessing platform features, hinder the potential for deeper engagement. This finding emphasises the need for platforms to incorporate more intuitive and user-friendly communication tools that foster active student participation, an aspect that is critical in leveraging mobile technology for educational success.

The lack of direct interaction between teachers and students is another key limitation, pointing to the need for DEP’s development to align with best practices in mobile learning. By incorporating features that enable real-time feedback, collaborative activities, and more dynamic learning paths, DEP could significantly enhance both teacher-student interactions and students’ understanding of content. This aligns with broader trends in the educational technology field, where mobile platforms are increasingly designed to create a more interactive, personalised, and engaging learning environment. The findings also resonate with those of Al-Sumairat [15], whose study highlighted the need for comprehensive development of DEP from the perspective of physics teachers. Collectively, these results contribute to the growing body of research advocating for the evolution of interactive mobile technologies to meet the diverse needs of learners and educators in the digital age.

The seventh area “Learner Support”. Means and standard deviations of the study sample’s responses were extracted as shown in Table 10.

Table 10. Means and standard deviations of the seventh area “Learner Support”

No.	Item	Means	SD	Rank	Degree
43	Course instructions include a clear description or link to available technical support and how to obtain it.	2.79	0.91	1	Moderate
44	Course instructions include a description or link to school services for regular students.	2.78	0.90	2	Moderate
47	Course instructions include a description or link of how services contribute to course success and how the learner accesses them.	2.77	0.92	3	Moderate
46	Course instructions include a description or link to how academic support and learning resources contribute to the success of this course and how the learner receives them.	2.77	0.95	4	Moderate
45	Course instructions include a description or link to the school’s services for students with special needs.	2.61	0.98	5	Moderate
	Total	2.74	0.81		Moderate

Table 10 explains that the means of the items in the seventh area ranged between 2.61 and 2.79. Further, item 43, which states, "Course instructions include a clear description or link to available technical support and how to obtain it," came in the first rank ($M = 2.79$, $SD = 0.91$), with a moderate degree. However, item 45, which states, "Course instructions include a description or link to the school's services for students with special needs," came in the last rank ($M = 2.61$, $SD = 0.98$), with a moderate degree. Furthermore, the overall degree of this area ($M = 2.74$, $SD = 0.81$) was moderate.

These results suggest that the DEP falls short in providing comprehensive support for diverse learners, particularly those with special needs. The platform does not offer services tailored to students across all ability levels, instead adopting a one-size-fits-all approach that treats all students equally, regardless of their individual learning needs. This limitation is significant in the broader context of interactive mobile technologies in education, where there is a growing emphasis on personalised learning and inclusivity. Modern educational technologies, especially mobile platforms, have the potential to adapt to diverse learning styles, offer differentiated support, and accommodate students with varying abilities, including those with special needs. By failing to incorporate these features, DEP misses an opportunity to fully leverage the capabilities of interactive mobile technologies to enhance learning outcomes for all students. This finding contributes to the ongoing conversation in the field of educational technology by highlighting the need for platforms to embrace more inclusive, adaptive, and personalised learning experiences, ensuring that every student, regardless of their abilities, receives the support they need to succeed.

The eighth area "Access and Use". Means and standard deviations of the study sample's responses were extracted as shown in Table 11.

Table 11. Means and standard deviations of the eighth area "Access and Use"

No.	Item	Means	SD	Rank	Degree
48	Course menus are easy to use.	3.05	1.02	1	Moderate
51	The course design is easy to read.	3.02	1.01	2	Moderate
49	DEP provides all the information necessary to access all the technologies used in the course.	2.94	1.00	3	Moderate
52	The multimedia in the course is easy to use.	2.92	0.98	4	Moderate
50	DEP provides alternative means of accessing materials in formats that suit different learners.	2.87	1.03	5	Moderate
	Total	3.00	0.89		Moderate

Table 11 clarifies that the means of the items in the eighth area ranged between 2.87 and 3.05. Further, item 48, which states, "Course menus are easy to use," came in the first rank ($M = 3.05$, $SD = 1.02$), with a moderate degree. However, item 50, which states, "DEP provides alternative means of accessing materials in formats that suit different learners," came in the last rank ($M = 2.87$, $SD = 1.03$), with a moderate degree. Furthermore, the overall degree of this area ($M = 3.00$, $SD = 0.89$) was moderate.

These results may reflect broader challenges associated with the integration of interactive mobile technologies in education, particularly in terms of accessibility and inclusivity. The difficulty some students face in accessing electronic courses, due to technical issues such as weak or unreliable internet connections, is a significant

barrier to the effective use of mobile learning platforms. This aligns with global concerns about the digital divide, where unequal access to technology—such as the availability of smart devices—limits students’ ability to engage with educational content, particularly in underserved regions. The high percentage of absenteeism among students could be linked to these access issues, alongside a lack of engagement and motivation, as students may feel there is insufficient oversight from instructors in the online environment.

Additionally, the uniformity of the materials provided on the platform, which are available in a single format for all students regardless of their learning levels or abilities, highlights a key challenge in the design of digital learning environments. While some learners may find it easy to navigate and interact with the content, others may struggle, leading to disparities in learning outcomes. This points to the need for adaptive learning technologies that can personalise content and support diverse learning needs, a key advantage of interactive mobile technologies. By addressing these barriers—accessibility issues, lack of personalised content, and reduced engagement—the findings contribute to the broader field of educational technology by emphasising the importance of inclusivity and adaptability in mobile learning platforms, ensuring they meet the diverse needs of all learners.

3.2 Second question

The second question is, “Are there statistically significant differences at the significance level ($\alpha = 0.05$) between the mean responses of teachers in Jordan related to the degree to which DEP meets IDS from their perspectives due to the variables of teacher’s gender, teacher’s specialisation, and the classes taught by the teacher?” To answer this question, means and standard deviations were calculated, and Table 12 reveals the results.

Table 12. Means and standard attributed to the study variables

Variable	Category	Means	SD
Gender	Male	2.81	0.67
	Female	2.85	0.75
Specialisation	Humanitarian	2.83	0.73
	Scientific	2.85	0.70
Classes taught by the teacher	1–6	2.83	0.80
	7–10	2.89	0.69
	11–12	2.78	0.63

Table 12 shows that there are apparent differences between the means in the degree to which DEP meets IDS from the perspective of teachers in Jordan depending on Teachers’ gender, specialisation, and classes taught by the teacher. To determine whether these differences were statistically significant at the level of significance ($\alpha = 0.05$), a three-way ANOVA was calculated for the effect of the variables of the Teachers’ gender, specialisation, and the classes taught by the teacher on the level to which the DEP meet to IDS from the perspective of teachers in Jordan (refer to Table 13).

Table 13. Three-way ANOVA attributed to the study variables

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Squares	F	Sig.
Gender	0.057	1	0.057	0.109	0.742
Specialisation	0.10	1	0.010	0.018	0.892
Grades they teach	0.584	2	0.292	0.558	0.573
Error	181.454	347	0.523		
Corrected total	182.171	352			

Table 12 shows that the value of F for the gender variable was 0.109. Further, the value of F for the specialisation variable was 0.018. Furthermore, the value of F for the variable of the classes taught by the teacher was 0.558. That is, these values are not statistically significant at the significance level $\alpha = 0.05$.

The result of the absence of statistically significant differences related to the degree of compliance of DEP with IDS due to the teacher's gender variable can be attributed to the fact that the implementation of DEP came suddenly, due to the health conditions that the world in general and Jordan in particular went through. This led to the inability to provide advance planning for teachers to deal with DEP. The lack of any previous experience among teachers also led to the convergence of their responses to the study instrument, regardless of their gender. This result agreed with Abdelkader and Khalifa [3]—despite the difference with it in some variables—which indicated that there were no statistically significant differences related to the importance of the components of EEP in achieving the outcomes of the educational process according to the gender variable. However, this result differed from the study of Graiabhei et al. [20]—despite the difference with it in some variables—which indicated that there were statistically significant differences related to the degree of effectiveness of DEP from the perspectives of physics teachers due to the gender variable and in favour of males.

The result of the absence of statistically significant differences related to the degree of compliance of DEP with IDS due to the teacher's specialisation variable can be attributed to the fact that most teachers in their various specialisations possess the same skills related to EEP in that they are not used primarily in teaching and are limited to the theoretical and not the practical side. DEP also presents the academic content for humanities and scientific subjects in the same way and at the same level, which makes the teachers' perspectives of all disciplines somewhat similar. This result is consistent with the study of Graiabhei et al. [20]—despite the difference with it in some variables—which indicated that there are no statistically significant differences related to the degree of effectiveness of DEP from the perspectives of physics teachers due to the specialisation variable.

The result of the absence of statistically significant differences related to the degree to which DEP meets IDS due to the variable of the classes taught by the teacher can be attributed to the fact that all the different academic levels need common controls that should be considered during the distance learning process. The most important of these controls is interaction, the learner's participation in educational roles, and direct communication with the teacher, and this is what is confirmed by IDS for the quality of e-courses. The teachers' opinions are consistent in terms of being influenced by the extent of interaction that the student achieves through these EEPs during the distance learning process, due to their belief in the importance of interaction and partnership between the teacher and the student, which

makes learning more meaningful and lasting longer. This result is consistent with the study of Al-Sumairat [15], while this result differed from the study of Graiabhei et al. [20]—despite the difference with them in some variables—which indicated the presence of statistically significant differences related to the degree of effectiveness of DEP from the perspectives of Physics teachers attributed to the variable of the classes taught by the teacher and for the benefit of the lower basic stage.

4 CONCLUSION, RECOMMENDATIONS, AND IMPLICATIONS

The study aimed to evaluate the extent to which the DEP aligns with IDS from the perspectives of teachers in Jordan. Additionally, it explored the relationship between the degree of alignment and variables such as the teacher's gender, specialisation, and the classes taught. The results revealed that the consideration of DEP for IDS was moderate. Furthermore, there were no statistically significant differences in the platform's alignment with IDS based on the teacher's gender, specialisation, or teaching level.

Based on these findings, the researchers recommended redesigning and enhancing the DEP to align more closely with internationally recognised standards such as QM, SCORM, INACOL, and IEEE-LOM, which ensure quality control within virtual learning environments. The researchers also suggested incorporating interactive elements such as augmented reality (AR) and virtual reality (VR) to enhance engagement and active learning [35], [36], [37], [38], [39], [51], particularly in learning management systems. These technologies can make complex concepts more accessible and provide immersive, realistic learning experiences. Integrating these tools into the platform can foster greater motivation and improve learning outcomes. Additionally, the researchers advised that the DEP be periodically reviewed and evaluated, with a maximum period of three years between reviews. They also recommended organising training workshops for DEP designers, focusing on the quality of design and development in accordance with IDS, to enhance the quality of e-courses. Training should cover aspects such as guidelines for easy access, learning objectives, instructional resources, and learner support. Furthermore, the study encouraged the Ministry of Education to adopt specific standards for the design and preparation of e-courses that align with IDS. Finally, the researchers emphasised the need for further qualitative research to gain deeper insights into users' experiences with DEP. Exploring these experiences can help pinpoint areas requiring improvement. In particular, examining students' experiences would provide a valuable perspective, especially in terms of usability and engagement.

The study's findings also have significant implications for policymakers and educators. The moderate degree of adherence to IDS suggests that there is room for improvement in the platform's design and functionality. Policymakers should prioritise enhancing DEP by aligning it more closely with international standards to ensure that it is user-friendly, accessible, and effective for a wide range of educators and students. This may involve improving navigation, enhancing accessibility for users with disabilities, and integrating more interactive multimedia elements to engage users. Since no significant differences were found based on teacher demographics, the platform should be universally designed to cater to all educators, regardless of their gender, specialisation, or grade level.

Policymakers should also ensure that teacher training programs are inclusive and provide teachers from all backgrounds with the necessary skills to use the platform effectively. Continuous professional development programs focused on integrating

technology into teaching should be made available to all educators. Given the moderate alignment of the platform with IDS, it is important for policymakers to establish a feedback system for teachers, such as regular surveys and focus groups, to identify areas for improvement. A feedback loop for teachers to report issues could facilitate timely adjustments and updates to the platform.

While the study found no significant differences based on teacher characteristics, it is important to recognise that teachers' familiarity with technology may vary. Therefore, personalised support, such as one-on-one coaching or peer support networks, should be offered to help educators feel more confident in using the platform effectively. By addressing these areas, the study underscores the need for a more adaptive and inclusive approach to digital education platforms, ensuring that all educators are equipped to leverage technology to enhance the learning experience for their students.

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