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An Online Program Utilizing Moodle to Develop Student Teachers' Competencies of Using Digital Platforms in the Light of Egypt's Vision 2030

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Abstract

This research aimed to developing an online program utilizing Moodle to develop student teachers' competencies of using digital platforms in the light of Egypt's Vision 2030. The researcher followed the experimental approach. The participants included 35 students from the Faculty of Education at Suez University. The proposed program was developed based on the ADDIE model and using Moodle as an online learning management system [LMS]. Moreover, A cognitive achievement test and observation checklist were developed to measure and collect data. The results showed a statistical difference between the students' scores in the pre- and post-test of the achievement, in favor of the post-test. Furthermore, a difference between the students' scores in the pre- and post-administration of the observation checklist, indicating a preference for the post-test. These findings indicate a clear impact of the proposed program in developing the performance and achievement related to the skills of using digital learning platforms for the student teachers. Based on these results, the researcher recommends applying the proposed program within teacher preparation programs.

Keywords

Online Program, Web-based learning, Moodle, Digital learning platforms, Google Classroom, Egypt Vision 2030

Introduction

Egypt Vision 2030 targets a set of national areas and dimensions, including Egypt in 2030 be among the top 30 countries in the world in terms of economic and human development. Notably, one of the objectives of this Vision is to ensure the quality of education across all levels and make it accessible to all individuals without discrimination (Ministry of Economic Development and Planning, 2022). According to (UNESCO, 2019) instructional skills in the future will require that teachers have the ability to employ and use technology creatively to support the learning environment. This entails enhancing knowledge management, acquisition, and application.

Ukah (2020) recommended that teachers should receive adequate training in the skills of preparing electronic educational resources and utilizing them in the teaching process. Additionally, Al-Rahili and Al-Omari (2020) emphasized the need to develop teachers' skills in dealing with digital technologies to enhance their practices and equip them for their evolving pedagogical roles in the 21st century. Similarly, Al-Asmi (2022) suggested integrating digital teaching skills into teacher preparation programs in colleges of education and providing training for student teachers to effectively utilize these skills.

According to Salman (2016), there is an urgent need to develop skills for dealing with digital learning platforms to enhance student progress and improve the educational process. Salman recommended focusing on the development of these skills for student teachers in the Education College. Furthermore, Askalani et al., (2018) emphasized the importance of encouraging teachers to utilize electronic classroom management programs and platforms, as well as moving away from traditional methods. They also highlighted the necessity of providing training courses for teachers to optimize the benefits of interactive

classroom management platforms and to promote the use and dissemination of interactive classroom technology at all levels of education.

Digital learning platforms refer to interactive environments that provide various materials and tools for presenting content, sharing resources, communicating with audio and video, and allowing interaction between the teacher and students (Al-Anzi, 2021). Furthermore, digital learning platforms offer capabilities and tools to effectively manage and organize the learning process, as well as design tests, activities, discussions, and remote electronic communication (Cavus, 2015).

Martin et al. (2012) found that students who utilize virtual classroom platforms express acceptance and satisfaction regarding the level of interaction within these platforms and classes. This includes the interaction between students, between students and teachers, between students and the platform's interface and tools, as well as the interaction between students and the educational content.

Google Classroom application is a prominent and contemporary free tool offered by Google in the field of education. It was introduced in 2014 to facilitate the management of e-learning through the Internet. Its main objectives include fostering communication between teachers and students in educational institutions, as well as enabling teachers to integrate technology into education by facilitating the design of educational materials and assessing student learning (Donya, 2020).

Despite the efforts that have been made to improve the skills of student teachers in using digital platforms, there is still a need for further research and study, especially considering the global trend towards digital transformation in education (Al-Mutairi, 2023). It is essential to focus on enhancing and developing the skills of student teachers in

utilizing digital learning platforms, including the Google Education platform. This will enable them to meet the demands of the twenty-first century, empower them technically and technologically, and contribute to achieving the goals of Egypt Vision 2030.

Specialists in the field of education unanimously recognize the significance of e-learning programs utilizing the Internet. This approach provides an opportunity for education to be accessible to everyone, especially in the face of rapid population growth. Online learning is adaptable to diverse circumstances and learner needs, offering innovative and interactive content delivery methods (Ismail, 2021). Moreover, it possesses distinct characteristics and features that allow students to learn and study remotely, without being restricted by time or geographical limitations.

Online learning and training aim to provide remote access to the learning process for all students, utilizing internet-based technologies, such as hyperlinks and multimedia, to access a wide range of educational resources online (Elmabaredy et al., 2020). In this context, Campion et al. (2012) underlines the importance of utilizing e-learning environments, programs, and web applications that prioritize students and their active participation in the learning system. These environments are valued for their flexible and interactive nature, which enhances the educational experience.

On the other hand, Egypt's Vision 2030 related to education and training aims to reach the most effective technological and electronic formats in displaying knowledge. Also, supporting and developing academic programs, in addition to empowering the teachers and students with the requirements and skills of the twenty-first century (Ministry of Economic Development and Planning, 2022). These aims reflect the importance of

developing electronic training programs, as well as empowering students and teachers with digital competencies.

Accordingly, this research seeks to develop an online training program using Moodle to develop student teachers' achievement and performance related to the competencies of using digital platforms in light of Egypt's Vision 2030. This study contributes to the promotion of digital technology utilization and the integration of innovative programs to improve the instructional abilities of student teachers, equipping them with the necessary competencies to prepare for the digital age.

Research Problem

The researcher's experience in the educational field revealed an issue related to the weak performance of students in using digital learning platforms. This problem became clear while the researcher was training the student teachers to use digital learning applications and platforms, such as Google Classroom. This observation is supported by various studies. For instance, Ibrahim (2019) found that student teachers in the Faculty of Education lacked familiarity with certain digital skills, such as designing digital classrooms. Similarly, studies conducted by (Yelubay et al., 2020; Al-Mutairi, 2023) indicated that current teachers also lack sufficient knowledge and skills to effectively incorporate digital technologies in their teaching practices, although they express motivation and willingness to acquire and be trained on these skills.

On the other hand, Egypt's Vision 2030 referred to some challenges related to education and training, including digital illiteracy for most teachers, and the weakness of educational programs and their lack of development (Sdsegypt, 2023). Consequently, there

is a need for developing web-based programs to enhance student teachers' competencies of using digital learning applications, such as digital platforms.

Moreover, the exploratory study conducted by the researcher included the application of a questionnaire to a group of students from the Faculty of Education at Suez University. The findings indicated that a significant percentage of the students, specifically 91%, expressed the need to enhance their skills in using digital platforms. Additionally, an overwhelming majority, 98% of the students, expressed a strong desire to receive training in these skills. The preferred method of training mentioned by the students was through the utilization of new programs and electronic environments.

Based on the aforementioned, the research problem is that there is a weakness in the competencies of using digital learning platforms among student teachers, particularly the Google Classroom platform. This gap highlights the need for the development of an online training program that can effectively enhance the achievement and performance aspects related to the use of digital learning platforms for student teachers. As well as contributing to achieving the aims of Egypt's Vision 2030.

Research Questions

The research problem was addressed by answering the following main question: What is the effect of an online program utilizing Moodle on developing student teachers' competencies in using digital platforms in light of Egypt's Vision 2030?

In addition, the research answered the following sub-questions:

Q1: What competencies of using digital platforms are required to be developed among student teachers in light of Egypt's Vision 2030?

Q2: What are the standards for developing the online training program?

Q3: What is the proposed design for an online program using Moodle to develop student teachers' competencies in using digital platforms?

Q4: What is the effect of an online program utilizing Moodle on developing achievement among student teachers?

Q5: What is the effect of an online program utilizing Moodle on developing performance of using digital platforms among student teachers?

Research Objectives

According to the aims of the Egypt Vision 2030, the research objectives have been explained as follows:

- Developing an online program utilizing Moodle to develop student teachers' competencies of using digital platforms.
- Measuring the effect of the proposed online program on developing achievement among student teachers.
- Measuring the effect of the online program on developing the performance of using digital platforms among student teachers.

Research Importance

1. Theoretical importance:

- Enrich the educational heritage by incorporating more topics that showcase the relationship between web-based learning and competencies in using digital platforms.

- Keep pace with developments in educational and pedagogical systems globally, particularly in relation to the digital transformation of education.

2. Applied importance:

- Providing a proposed model for an online training program that can be applied in educational institutions to develop teachers' electronic and technological skills.
- Developing students with applied skills and experiences that qualify them to carry out their educational role in the digital age.
- Providing educational program designers with a set of results that may help them design and develop distance learning programs.

Research Hypotheses

H1: There is a statistical difference between the mean scores of the participating group in the pre-test and post-test of the achievement test related to the competencies of using digital platforms in favor of the post-test.

H2: There is a statistical difference between the mean scores of the participating group in the pre-test and post-test of the observation checklist in favor of the post-test.

Research Terms

1. Online program:

The online training program is a web-based e-learning system utilizing learning management systems such as Moodle. It aims to provide a comprehensive platform for delivering course-specific knowledge, experiences, and activities through the Internet. Such as the skills of using Google Classroom, which the current research addresses.

2. Moodle:

Moodle is an open-source learning management system [LMS]. It's designed to facilitate digital learning and course management. It provides a platform to create personalized online learning programs, deliver content related to the competencies of using digital platforms, assess student performance through quizzes and assignments, and interactive collaboration through discussion and communication tools.

3. Digital learning platforms:

Digital learning platforms are defined as e-learning systems, such as Google Classroom, that facilitate the management of the learning process anytime and anywhere. These platforms assist teachers in creating a conducive learning environment by offering various tools, including lesson creation, content development, and activity management, as well as an electronic assessment.

4. Egypt's Vision 2030:

Egypt Vision 2030 is a long-term strategic plan for Egypt to achieve the goals and principles of sustainable development in all fields, including learning and training. The vision seeks to integrate digital technology into education practices, focus on the developing educational programs aimed at fostering digital transformation, and enhance digital competencies among educators.

Literature Review

Online training programs

Online training refers to instruction and training that is delivered electronically utilizing a variety of multimedia, instructional platforms, and Internet applications to

deliver educational content. This term is often used interchangeably with other expressions such as e-learning, web-based learning, computer-assisted training, and Internet-based training (Maddison et al., 2017). Online programs are defined as a systematic process occurring within an interactive environment that is enriched with digital technological applications. These programs are based on Internet networks, multimedia computers, and electronic devices (Al-Mousawi, 2010).

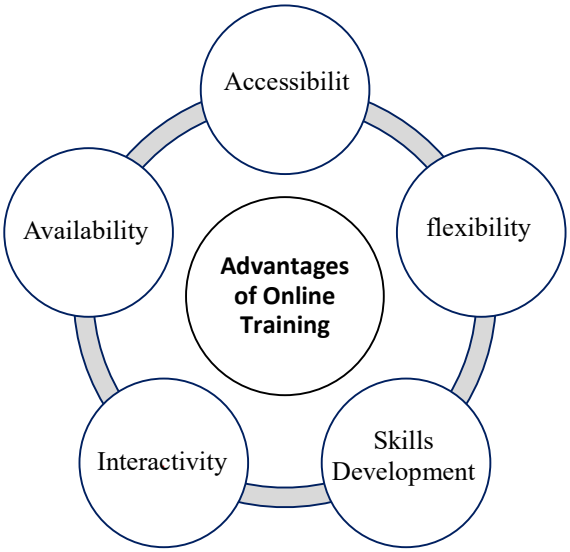
Online training programs employ advanced educational information and communications technology based on computers and the internet and allow synchronous and asynchronous mutual communications between the teacher and learners (Rabie & Al-Salami, 2010). In addition, Tolba (2011) pointed out that web-based learning programs are the most appropriate learning programs that provide active participation and interaction in different styles, by employing interactive learning methods within these programs.

The advantages of online training include accessibility to the course materials, flexibility in scheduling, a variety of academic options, and the opportunity to develop valuable skills (Susilana & Pribadi, 2021) as well as positive relations and interactions among instructors, learners, and peers, as presented in Figure 1.

The online training programs hosted on the learning management system (LMS) provide interactive content and include educational activities such as discussions, applied exercises, and quizzes (Gilbertson et al., 2021). Moodle system is one of the most widely used and effective LMS in online e-learning and training (Corpus, 2020). Moreover, the Moodle system is free (open source) and easy to use in creating and publishing lessons online, in addition to being fully available in Arabic. Therefore, the Moodle system was used in current research to publish and manage the training program online.

Figure 1

Advantages of online training



The development of online training programs is based on fundamentals and principles related to learning theories, including information processing theory, cognitive constructivist learning theory, and connectivism theory. The information processing theory posits that learning occurs through cognitive processes including attention, encoding, storage, and retrieval of knowledge, all of which are influenced by the online course design (Bovy, 1981). In this context, Khamis (2015) pointed out that according to constructivist theory scholars, learning and training are meaningful processes that differ from one individual to another based on the nature of learning, the assigned tasks, and the nature of the interaction that occurs between the student and the learning environment.

On the other hand, the connectivism theory assumes that learning aims to develop the ability to perform a specific skill. It suggests that learning and training occur through linking information sources, and the ability to find information is more important than knowing information. Furthermore, the ability to perceive and comprehend connections and associations between domains and ideas is a crucial skill for learning and training

(Siemens, 2005). Accordingly, these principles were considered when developing the online program in this research.

Previous works related to the online programs:

Al-Najjar (2016) addressed effectiveness of the integration between the distance learning management system "Moodle" and Web 2.0 applications in providing female students at the Faculty of Education with the concepts of educational technology. The study used the descriptive and the quasi-experimental approaches, the sample consisted of (90) students from the Faculty of Education at Al-Aqsa University. The results concluded that there were statistically significant differences between the average scores of the research groups in favor of the group that studied through the integration system.

In addition, Al-Ghamdi (2017) aimed to measure the impact of web-based training in improving skills among secondary school teachers in Jeddah, the study used the experimental method. The results concluded that there is an impact of web-based electronic training in improving teachers' electronic test preparation skills. Also, Nadeak (2020) analyzed distance education using social media, and its effectiveness during the Covid 19 pandemic. The study relied on collecting data using a questionnaire applied to (250) students, and the results concluded that distance learning using social media and social communication is only effective in theoretical learning programs, as it was less effective in teaching applied and practical programs.

Moreover, Al-Adl (2020) concluded that electronic programs via the Internet achieved a positive impact on the performance of teaching skills and the use of technology in teaching among teachers, and recommended building electronic programs for teachers considering their needs and training them on using computers and dealing with electronic

platforms. Therefore, Al-Rashidi and Mubariz (2020) recommended providing integrated environments and programs to employ modern learning strategies and integrate them with technological innovations such as online learning strategies. Furthermore, Elmabaredy et al. (2020) explored the difference in the style of providing web-based adaptive content (frames/adaptive media), and its impact on improving learning outcomes in higher education. The results concluded that there was an effect of both styles of content presentation on improving student achievement and performance, and that adaptive media was more influential compared to the frames.

In addition, Gilbertson et al. (2021) suggested an online training program for undergraduates enrolled in a research program addressing communication skills, knowledge of research, literacy, and research ethics. Results revealed no significant differences across disciplines. The findings suggest that the training content was successful in providing students with research knowledge and skills. In the same context, Susilana and Pribadi (2021) aimed to investigate the impact of delivering constructive feedback to students enrolled in an online learning program. The study involved 30 participants. Pre-test and post-test were conducted to assess the effects of constructive feedback on the cognitive development of the students. The findings suggest that providing constructive feedback enhances students' motivation and knowledge as they engage in online learning programs.

Similarly, a study by Purnama et al. (2023) found that online learning integrates technology and becomes a part of digital multimedia implemented in digital learning and blended learning that impacts on the students and teachers. Therefore, future research needs to explore online training and web-based e-learning. Moreover, Hefter (2023) examined

web-based training based on the role of self-explaining and smartphone usage, the experimental web-based training was applied with 53 teacher students. Findings emphasized the effectiveness of self-explain video examples during web-based training.

Digital learning platforms

Digital learning platforms are defined as systems utilizing computers and the Internet to facilitate distance learning. These platforms offer capabilities and tools that support learning activities including discussions, questions, exercises, and tests, which can be implemented synchronously or asynchronously (Gunawan et al., 2020).

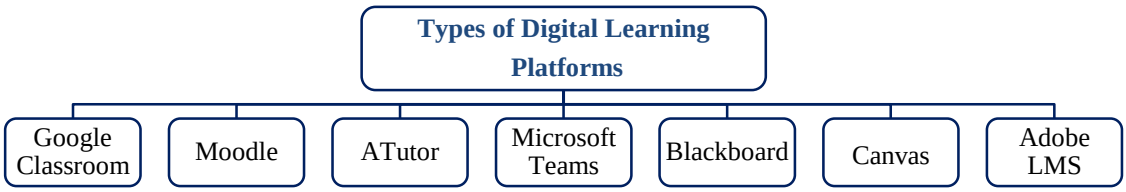
In e-learning and education, digital platforms have many benefits and advantages that enhance the educational process. One of the key advantages is the ability to divide students into classes using the circles feature, which serves as an alternative to traditional classrooms. Additionally, video calling enables the facilitation of training courses and educational sessions using video conferencing technology (Tolba, 2016). Moreover, the use of digital platforms facilitates the content delivery in diverse ways, accounting for the individual differences among learners (Chen & Wang, 2021). Also, digital learning platforms afford teachers easy and convenient communication with students and colleagues, regardless of time or location, while offering a variety of electronic assessment and evaluation methods (Al-Anzi, 2021).

Regarding the types of digital learning platforms, there are free (open source) platforms and commercial platforms. Free learning platforms, such as Moodle, Google Classroom, EdApp, ATutor, and MS teams. On the other hand, the commercial platforms include Blackboard, Adobe LMS, and Talent LMS. It's important to note that a variety of

digital platforms have been utilized in schools and universities since the Covid-19 pandemic until now. The most popular digital learning platforms presented in Figure 2.

Figure 2

Types of digital learning platforms



In this context, Abdel Moneim (2020) pointed out that Google Classroom is one of the most important Google applications that can be used as digital or virtual classrooms in teaching educational courses. Google Classroom refers to a computerized system that together and internet, integrates Google educational applications and services together, and allows its users to provide e-learning and manage its operations (Chicioreanu & Cosma, 2017). Furthermore, it provides services to teachers by managing classes. virtualization, communicating with students, providing content, and conducting assessments in different ways (Ziada, 2021).

In addition, Benta et al. (2015) added that there are several skills necessary to use digital platforms effectively in education, including dealing with the interface of the platform, creating electronic content, publishing educational resources and activities, and creating assignments and quizzes. Accordingly, the important and necessary skills for utilizing digital learning platforms were considered during the analysis and identification of competencies for using the Google Classroom platform in the current research.

Previous works related to the digital learning platforms:

Study by Askalani et al. (2018) confirmed that the necessity of encouraging teachers to manage classrooms using electronic classroom management programs, moving away from traditional methods, and organizing training programs for teachers to activate the services provided by interactive classroom management platforms. Therefore, Ibrahim (2019) investigated the effectiveness of Google apps in improving digital skills related to using Google Classroom among student teachers. The results concluded that there were statistical differences between the scores of the students in the pre-test and post-test incline toward the post-measurement of performance and achievement. Moreover, Al-Bawi and Ghazi (2019) studied the impact of using educational platforms on the achievement of students in the computer department and their attitudes towards e-learning. The study samples included two groups. The results indicated that there is an effect of using the digital platform on the achievement of the experimental group and their attitudes toward e-learning.

In the same context, study by Donya (2020) measured the impact of using Google Classroom in developing the achievement of third-year female students at the Faculty of Arts. The results showed a statistical difference between the average scores of the experimental and control groups in the post-application of the achievement test in favor of the experimental group. Also, Basantes- Andrade et al. (2020) identified and analyzed teachers' digital competencies and skills related to online learning management, used the descriptive analytical approach and concluded that in addition to benefiting from the tools and aids that information and communication technologies made available to teachers, they

also need pedagogical and social skills that allow them to generate an environment of cooperation and learning.

Similarly, Ziada (2021) aimed to explore the attitudes of general education students towards using digital platforms in learning. The study results explained that there were statistical differences between the scores of the attitudes of general education students towards learning via platforms according to the gender variable. According to Al-Shahrani (2022), middle school teachers possess a significant level of digital skills required to utilize the platforms. The study suggested that teachers should be trained in using electronic classrooms and educational platforms to enhance their proficiency in utilizing these tools effectively.

Furthermore, Al-Mutairi (2023) aimed to investigate the extent to which primary school teachers mastered the digital skills necessary for distance teaching considering the digital transformation. The study used the descriptive approach, and the results concluded that the extent to which primary school teachers mastered the digital skills necessary for distance teaching considering the transformation of the digital response rate in the State of Kuwait was moderate. In addition, Songkram et al. (2023) investigated students' behavioral intentions toward using digital learning platforms, the empirical study was applied, and the recommended research model was tested with a sample of 1406 students. According to the results, the best way to facilitate students' adoption of digital platforms is their attitude (ATT), then internal factors (such as perceived usefulness) (PU) and ease of use (PEU).

Egypt's Vision 2030

Vision of Egypt 2030 is a national plan prepared in February 2016 that reflects the country's long strategic plan to realize the goals and principles of sustainable development in all areas and to mainstream them in the different state agencies (Sdsegypt, 2023). Egypt's Vision 2030 aims to improve the quality of the educational system and encourage creativity and innovation in introducing technology as an essential educational element (Ministry of Economic Development and Planning, 2022).

In this context, study by Gomah (2020) aimed at developing programs at the Faculty of Education in the light of the requirements for achieving Egypt's Vision 2030. The study used the descriptive method. It is recommended that the necessary to develop learning programs at the Faculty of Education. Moreover, Waly (2023) addressed the role of technology in achieving sustainable development in the light of Egypt's Vision 2030. it concluded that employing technology in education enhances Egypt's Vision 2030.

Also, Koura and El-Mansi (2023) discussed the potential of artificial intelligence in preparing teachers in light of Egypt's Vision 2030. Therefore, the study addressed the challenges and opportunities associated with integrating artificial intelligence into the training of educators to realize the goals of Egypt's Vision 2030. Consequently, the study concluded with a proposal to integrate artificial intelligence techniques in enhancing teachers' preparation programs in the Faculties of Education.

The objectives of Egypt's Vision 2030 related to the current research include building capabilities and enhancing the efficiency of teachers at all educational levels, developing curricula and educational materials, and providing an integrated system for distance education (Ministry of Economic Development and Planning, 2022).

Methodology

This research employed an experimental approach to analyze and describe the problem, as well as to analyze the skills of using digital learning platforms for student teachers. Furthermore, a single group participated in this research, and pre-tests and post-tests were conducted to measure the impact of the suggested web-based program.

Participants

The research sample consisted of 35 third-year students at the Faculty of Education at Suez University with scientific specializations (biology - mathematics - chemistry). These participants were selected randomly, ensuring a fair representation of the population. All students in the sample met the prerequisites for studying the content of skills required for using digital platforms.

Preparing a list of skills for using digital learning platforms

To prepare a list of skills for using digital platforms in accordance with the goals of Egypt's Vision 2030, the researcher reviewed some previous works and studies that use and management of educational applications, and dealing with the Google educational platform in particular, such as (Al-Yami, 2020; Al-Aasar, 2019; Shaheen, 2019; Tolba, 2016; Ibrahim, 2019; Basantes-Andrade et al., 2020; Hassounah, 2020; Ukah, 2020; Yelubay et al., 2020). Accordingly, an initial list of skills for using digital platforms was prepared, and then presented to a group of arbitrators to verify their veracity. Considering this, the arbitrators' suggestions were implemented, and a list of skills was prepared into final form, including 7 main skills and 59 sub-skills. The main skills were as follows:

- Configure and set up the Google Classroom platform.
- Create a new classroom.

- Manage participating students.
- Classification of the class topics.
- Add class materials.
- Assign and manage tasks.
- Assign questions.

Preparing the standards for developing suggested digital learning platforms:

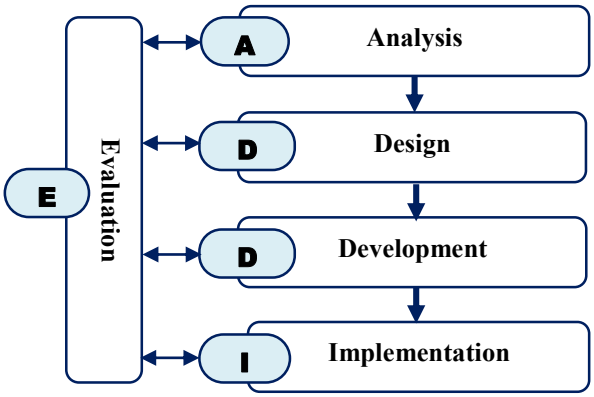
The aim of preparing a list of standards is to determine the educational and technical conditions and specifications necessary to design the proposed online program. To determine and formulate a list of development standards, the researcher reviewed some resources (Al-Halafawi, 2011; El-Batea & Abu Khatwa, 2012; Khamis, 2015; Sweidan, 2010; Wang, 2009). The list of standards included two main categories: educational standards and technical standards. The number of standards in the initial form of the list was (100) standards. Moreover, the standards were presented to a group of experts in the field of educational technology. After analyzing the opinions and suggestions of the experts, all necessary revisions were implemented. Accordingly, the list of standards became in its final version, as it included (38) standards in the field of educational standards and (62) technical standards.

Development of the proposed web-based program

The proposed web-based program was developed according to the ADDIE model, as in the following Figure 3.

Figure 3

ADDIE model



1- Analysis

In the analysis phase, the students' characteristics were analyzed, identified, and analyzed the research problem. Also, identified the student teachers' needs for skills in using the Google Classroom platform.

Analysis of students' characteristics:

The target group is third-year students in the Faculty of Education, aged between 21-23 years. Their mental, psychological, social, and cultural characteristics are similar. They need to develop their skills in using digital platforms.

Problem analysis:

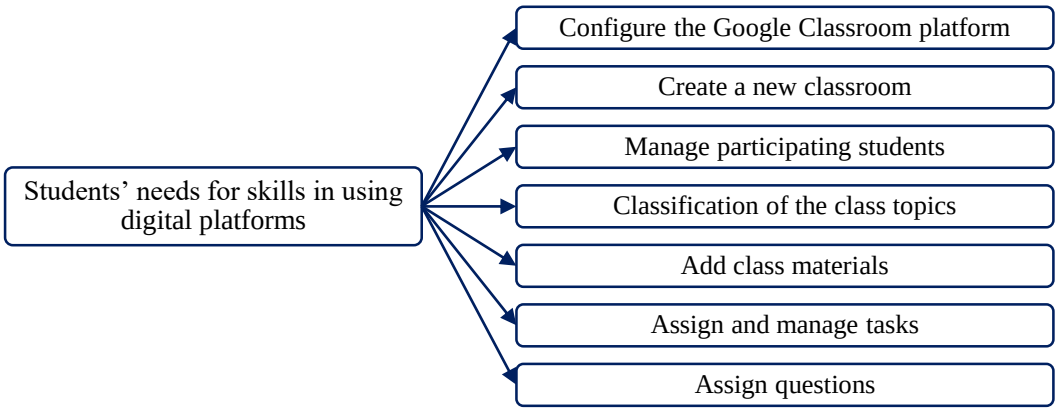
Based on the analysis of the research problem, it was found that there is a weakness among student teachers at the Faculty of Education in the cognitive and performance aspects related to the skills of using digital platforms. Therefore, there is a need to develop a proposed online program to develop students' skills.

Analyze students' needs:

Students' needs were analyzed into 7 main needs as shown in Figure 4:

Figure 4

Students' needs for skills in using digital platforms.



Analysis of the environment:

The researcher used the Moodle environment to upload and publish the proposed program online. Furthermore, the experimental application environment for the program was the computer lab in the Faculty of Education at Suez University.

2- Design

In this phase, the proposed program scenario was developed, objectives were prepared, and the resources and multimedia (i.e. text, images, educational videos, PDF files, and Infographics) were selected, in addition, learning strategies and evaluation methods were also determined.

Formulating the objectives:

The objectives were formulated according to the ABCD model (Audience – Behavior – Condition – Degree) and were organized into a list that included 7 general goals and 35 cognitive objectives. The general objectives were formulated as follows:

- Students know how to configure and set up Google Classroom.
- Students master the skills of creating a new classroom.
- Ability to manage participating students.

- Students master the skills of classifying class topics.
- Developing students' skills in adding class materials.
- Ability to assign and manage tasks.
- Students apply the skills of assigning questions.

Program Scenario Design:

A detailed plan has been prepared for everything included in each screen of the program, such as clarifying the screen number, title, and description of each screen, as well as the visual and audio aspects, as well as browsing and navigation methods.

Preparing the educational media and resources:

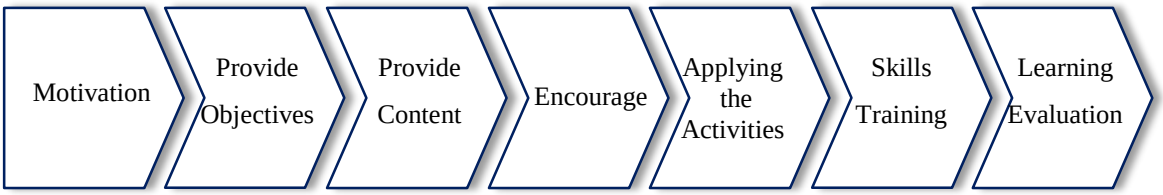
Computer applications were utilized to create learning resources and media. Therefore, Microsoft Word was used to prepare texts, Adobe Photoshop was used for image preparation and processing, and Camtasia Studio was used for video editing.

Designing learning strategies:

An organized plan has been prepared that consists of a set of educational activities and procedures arranged in an appropriate sequence to achieve the objectives and develop students' skills. Figure 5 shows the steps of this strategy.

Figure 5

Learning Strategy



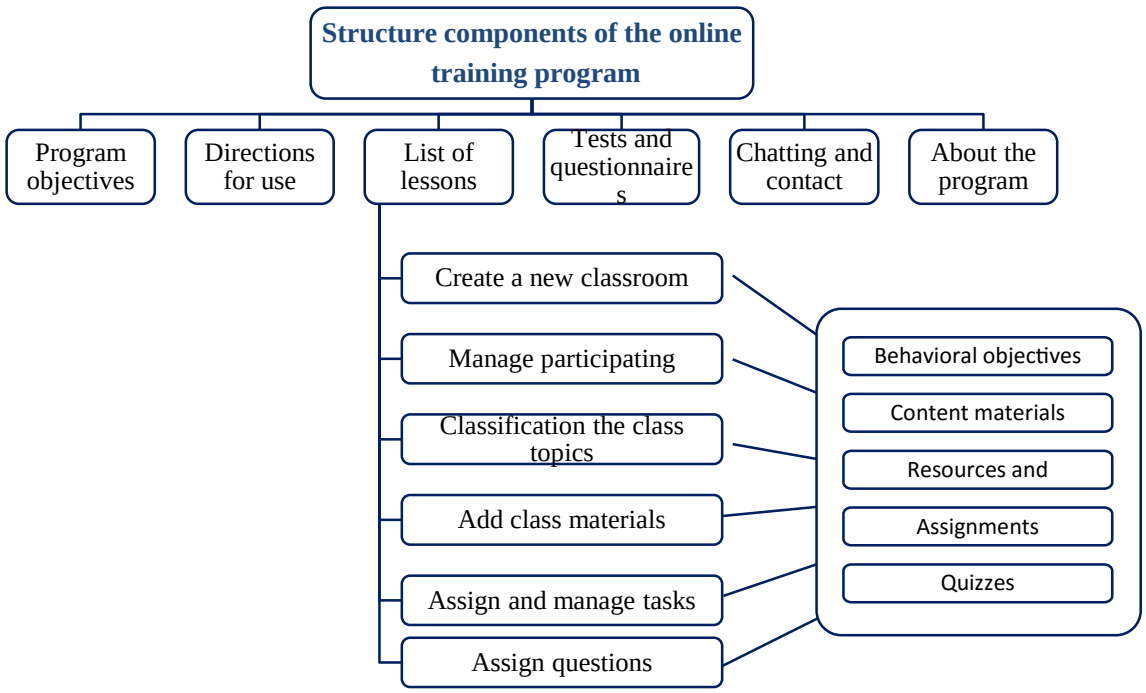
3- Development

During this stage, the program scenario was implemented. The researcher used the "Articulate Storyline" software to author and produce the program content. Also, the main and sub-pages were created, then the links were activated between all pages. Moreover, multimedia and resources have been added to the pages. Additionally, a multimedia menu was provided, including various enrichment and hypermedia sources.

Consequently, the structure and development of the online training program consists of components such as: (1) program objectives; (2) directions of using the program; (3) list of lessons; (4) tests and questionnaires; (5) chatting and contact; (6) about the program. Furthermore, each lesson of the program consists of components such as: behavioral objectives, content materials, resources and multimedia, assignments, and quizzes. As shown in Figure 6.

Figure 6

Structure components of the online training program

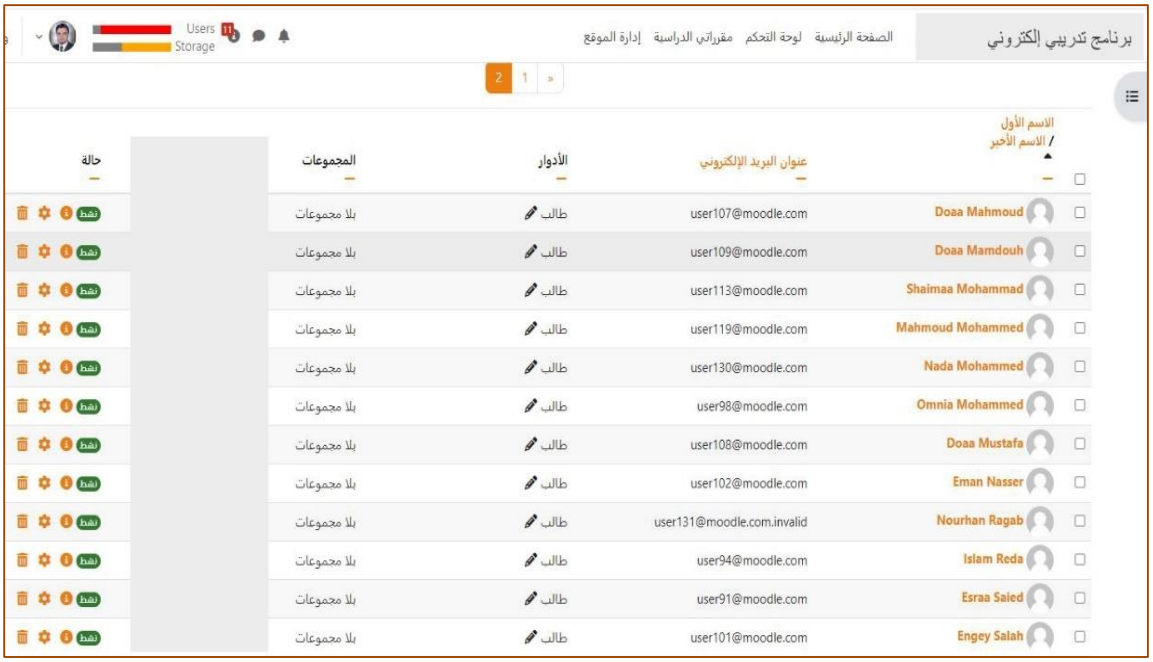


4- Implementation

During this stage, the participating students were added to the Moodle system, and their data was recorded. Figure 7 shows the participants page in Moodle.

Figure 7

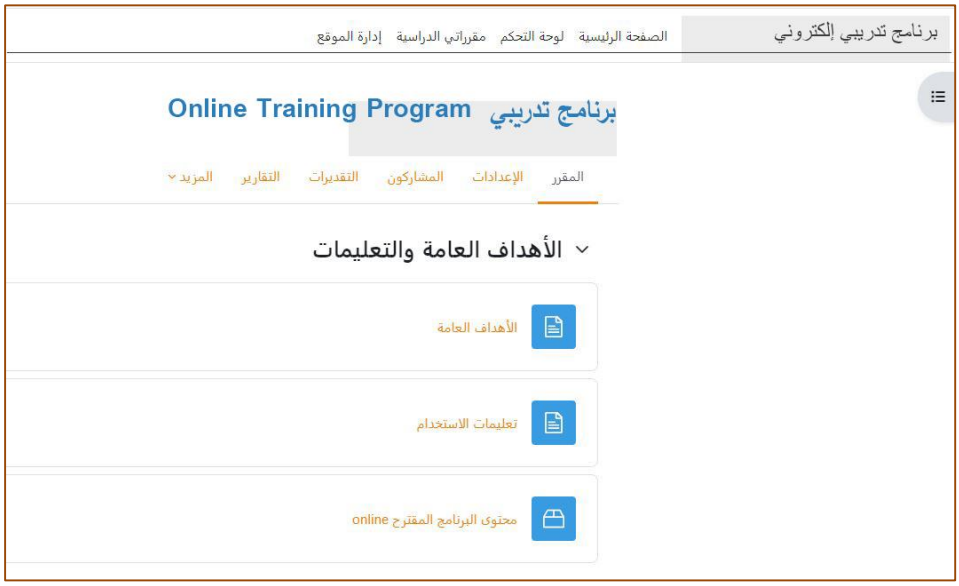
The participants' page.



In addition, the program content was exported according to SCORM standards and then uploaded online utilizing the Moodle system. Accordingly, the online program was implemented by applying it with participating students. The students were directed to enter the program via the Moodle system, interact with the lessons, implement activities and applications, and practice skills. As shown in Figure 8.

Figure 8

Publish the online program in Moodle.



5- Evaluation

In the evaluation phase, the proposed program was provided to the specialized experts in instructional technology filed, to review the content design, and provide any comments or suggestions. Moreover, the program was evaluated by applying the instruments and verifying its effectiveness and efficiency in improving the skills among students.

Instruments

Achievement test

The achievement test was designed to measure the achievement of student teachers at the Faculty of Education in the cognitive aspects of using digital learning platforms after studying them through the proposed program on the web. According to the objectives and using the specifications table, the researcher formulated the test questions in their initial

form as multiple-choice questions (MCQ). All questions were presented to a group of specialized experts. Furthermore, the test's reliability was assessed using the statistical program SPSS, and Cronbach's Alpha was calculated, resulting in a value of 0.77, indicating high reliability. Also, the ease and difficulty coefficients were from 0.80 to 0.20, all falling within an acceptable range. Moreover, the average time taken by all students to complete the test was approximately 25 minutes, which was deemed appropriate. Based on these procedures, the researcher prepared the final version of the test in electronic form, consisting of 40 multiple-choice items.

Observation checklist

The observation checklist was designed to evaluate the student teachers in the competencies of using digital learning platforms. To determine and formulate the performances included in the checklist, the researcher referred to various sources, including previous research, studies, and a list of skills for using digital platforms. These skills were prepared and formulated in the observation checklist as descriptive phrases. Additionally, the observation checklist was presented to some specialist experts, and their comments and suggestions were collected. All necessary notes and comments were implemented based on the feedback from the experts. Moreover, the researcher employed a method of agreement between observers using the Cooper equation, and it was found to be 89%, indicating a high degree of stability.

Pre-applications

After the students logged in to the Moodle system online, they answered the pre-test. Also, the observation checklist was used to evaluate all students in the pre-application.

Research experiments

The research experiment involved students logging into the online program through the Moodle system and allowing them to access the educational lessons. All students followed the presentation of the content, engaged in implementation, practiced the required skills, and then completed the assigned activities. Figure 9 shows the lessons and content interface.

Figure 9

The lessons and content interface.

Post- applications

Instruments were applied in the posttest, this included application of the achievement test and the observation checklist card to all participants.

Statistical tools

This research used SPSS software to process and analyze the collected data statistically. The following methods were employed:

- Means and standard deviations.

- Cronbach's Alpha coefficient.
- Paired samples t-test.
- Effect size (eta squared η^2).

Results

The first, second, and third research questions were answered in detail in the previous section within the research procedures.

The fourth research question focuses on the effect of the online program on developing achievement among student teachers. To address this question, the first hypothesis was validated.

The first hypothesis

"There is a statistical difference between the mean scores of the participants group in the pre-test and post-test of the achievement test, in favor of the post-test."

To verify this hypothesis, a paired samples t-test was applied, Moreover, the effect size was calculated using (η^2). The results are presented in Table 1.

Table 1

T-test of the pre-post application of the achievement test

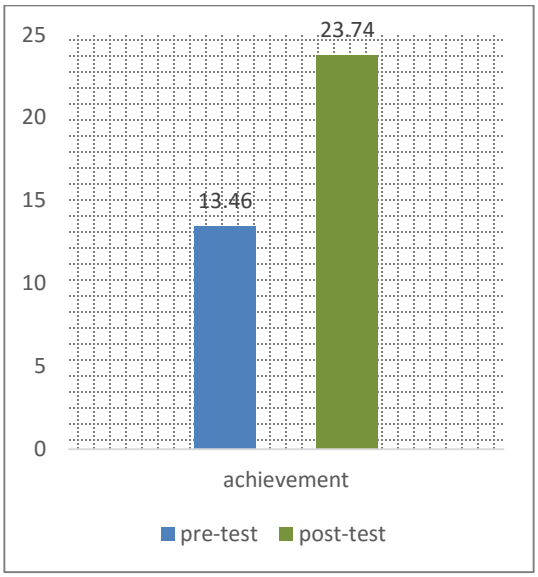
Achievement test	n	mean	t	df	sig	effect size
pre-test	35	13.46	8.35	34	0.000	0.6
post-test	35	23.74				

Based on the results presented in Table 1, there is a statistical difference between the average scores of the experimental group students in the pre-and post-applications of the achievement test. The calculated "t" value of 8.35 indicates statistical significance.

Additionally, "eta square" (η^2) was 0.6. These results suggest a large impact of the proposed program on the development of student teachers' achievement. Consequently, the first hypothesis is accepted. Figure 10 illustrates a schematic diagram for this result.

Figure 10

Diagram of the difference between the average scores in the pre-post test



The fifth research question focuses on the impact of the proposed online program on developing performance of the student teachers' competencies in using digital platforms. To address this question, the validity of the second hypothesis was tested as the following:

The second hypothesis

"There is a statistical difference between the mean scores of the participants group in the pre-test and post-test of the observation checklist, in favor of the post-test." To verify this hypothesis, a paired samples t-test was used, also, the effect size was calculated using the eta square η^2, as shown in Table 2.

Table 2

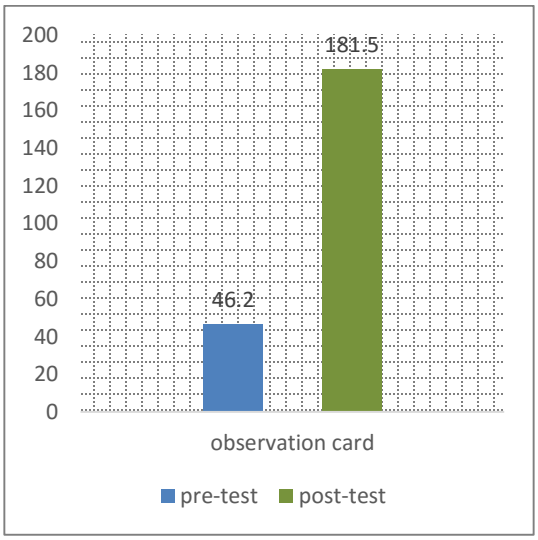
T-test for the difference between the scores in the pre-and post-applications of the observation checklist

Observation checklist	n	mean	t	df	sig	effect size
pre-test	35	46.20	70	34	0.000	0.9
post-test	35	181.5				

Based on the results presented in Table 2, it is indicated that there was a statistical difference between the average scores of the experimental group students in the pre-and post-applications of the observation checklist. The calculated "t" value of 70 indicates statistical significance. Furthermore, the "eta square" (η^2) of 0.9. This result confirms the significant impact of the proposed program on developing the skills of student teachers. Consequently, the second hypothesis is accepted. Figure 11 illustrates a schematic diagram for this result.

Figure 11

Diagram of the difference between the average scores in the pre-post-test of the observation checklist



Discussion

The research results showed that there was a statistical difference between the scores of the experimental group in both the pre-test and post-test of the achievement test and the observation checklist. This finding suggests that the proposed web-based program has a significant impact on the development of student teachers' achievement and their skills in using digital platforms, specifically the Google Classroom platform. These results can be interpreted and discussed in light of several factors as follows:

- The proposed web-based program played an important role in facilitating the use of digital and multimedia learning resources among student teachers. By integrating these resources into the program, student teachers were able to enhance their understanding of content, acquire new concepts and knowledge, and keep more information.
- Educational videos have been facilitating student learning and skill practice within the program. These videos provided a simulated environment for students to observe and learn how to perform specific skills. By following the step-by-step demonstrations in the videos, students were able to imitate and execute the skills themselves.
- The organization of lessons within the program facilitated through the Moodle system, played an important role in enhancing student learning outcomes. By presenting clear objectives at the beginning of each lesson and organizing content elements in a logical and structured manner.
- The uploading of the proposed program to Moodle played an effective role in facilitating online learning at anytime and anywhere. This approach provided students with the flexibility to access the program and engage in individual learning according to their own pace and preferences.

- Moreover, the individualized learning approach supported by the program allowed students to progress at their own pace. Each student could navigate through the program's content and activities based on their individual learning needs and preferences. This personalized learning experience catered to the diverse learning styles and abilities of students, promoting a more effective and engaging learning environment.
- Students implement the skills of using the Google Educational platform and apply them to their lessons in their field of specialization, as well as in practical education, making the learning process more important and realistic for students.
- The results of the research confirm the principles of constructivist theory in education, such as the freedom of the learner to build his own information and skills, whether individually or in partnership with his peers and the teacher, and their connection to previous information and experiences, as well as achieving a type of interaction between the learner and the electronic program in order to understand the skills and the occurrence of adaptation and balance among the students. The learner then acquires skills arising from new experience.
- The results of the research can be interpreted in light of the principles of communication theory, which sees learning as the process of linking different sources on the Internet. The hyperlinked design of educational lesson elements within the program, and the provision of enriching external web links to support learning, helped students acquire information and knowledge related to skills, and thus achieve learning.

The current research findings agree with the results of some previous studies, such as a study by Abdel Moneim (2020) which found positive results in improving achievement and performance in using digital educational applications. Also, the research findings agree

with the results of Al-Aasar (2019), which concluded to improve the skills of using the Google educational platform among university students. Similarly, the findings agree with the study results of Al-Jalahmi and Al-Bashri (2021), which revealed the effectiveness of an online training program in developing the achievement and performance related to electronic course design skills among faculty members. Moreover, the research findings align with the results of Ibrahim (2019), which indicated statistically significant differences between the mean scores of students in the pre-and post-test of the achievement and performance related to competencies of using Google Classroom in favor of the post-test. In addition, the results of the current research were consistent with (Al-Anzi, 2021; Al-Najjar, 2016; Elmabaredy et al., 2020; Gilbertson et al., 2021; Hefter, 2023; Shaheen, 2019; Simanullang & Rajagukguk, 2020; Tolba, 2016).

Conclusion and Recommendations

The findings of this research reveal that the program has contributed to enhancing the student teachers' competencies in using digital learning platforms. These were clear in the enhancement results of measuring cognitive achievement and performance. Moreover, these results are a strong endorsement of achieving the objectives of Egypt's Vision 2030. They have provided applied solutions to address some challenges indicated by Egypt's Vision 2030. As we embark on the digital age, promoting digital transformation in higher education is crucial for empowering and enhancing the learning and teaching experience.

Based on the results and conclusion of the current research, the following recommendations are provided:

1. Faculties of Education should integrate the proposed program into the curriculum to enhance the digital skills of future teachers.
2. Teachers need more professional training on using digital learning platforms.
3. Raise awareness among educational institutions and stakeholders about the need to update teacher preparation programs in line with the Egypt Vision 2030.
4. Higher education institutions should encourage the transformation from traditional teaching methods to online and electronic methods in light of Egypt's Vision 2030
5. The Ministry of Education should organize workshops to train in-service teachers on using distance learning applications and platforms.

For future studies, the researcher recommended the following issues:

- The effect of a proposed program based on Web 3.0 apps to improve the performance of using Google applications among teachers.
- A proposed scenario for developing teacher preparation programs in colleges of education in the light of Egypt's Vision 2030.
- Attitudes of student teachers in colleges of education towards using distance learning platforms in education.

References

Abdel Moneim, R. (2020). The effectiveness of employing digital classrooms in developing the skills of using some educational Google applications in the curriculum computing course among students at Al-Aqsa University in Gaza. *Palestinian Journal of Open and E-Learning, 8*(14), 92-104. https://journals.qou.edu/index.php/jropenres/article/view/2357

Al-Aasar, S. (2019). The difference in the style of presenting infographics and its impact on self-regulation of learning and practical performance of virtual classroom creation skills among Najran University students. *Journal of Educational Technology - Studies and Research,* (41), 91-144. https://doi.org/10.21608/tessj.2019.273626

Al-Adl, M. (2020). An electronic training program in light of professional needs and its impact on the teaching skills of physical education teachers in Damietta. *Assiut Journal of Physical Education Sciences and Arts, 3*(52), 187-221. https://doi.org/10.21608/jprr.2020.190435

Al-Anzi, A. (2021). The effectiveness of a training program based on interactive e-learning platforms in develop skills of using augmented reality applications among middle school teachers in Kuwait. *Journal of the Faculty of Education, Alexandria University, 31*(1), 60-21. https://doi.org/10.21608/JEALEX.2021.155212

Al-Asmi, F. (2022). The degree to which teachers of outstanding students in the Republic of Yemen possess digital teaching skills from their point of view. *International Journal of Research in Educational Sciences, 5*(3), 246-298. http://doi.org/10.29009/ijres.5.3.1

Al-Bawi, M., & Ghazi, A. (2019). The impact of using the educational platform Google classroom on the computer department students' achievement of image processing and their attitudes toward e-learning. *International Journal of Research in Educational Sciences, 2*(2), 123-170. http://dx.doi.org/10.29009/ijres.2.2.4

Al-Ghamdi, S. (2017). The effectiveness of web-based electronic training in developing electronic test preparation skills among secondary school teachers in Jeddah. *Fayoum*

University Journal of Educational and Psychological Sciences, 4(7), 243-274. https://doi.org/10.21608/jfust.2017.83456

Al-Halafawi, W. (2011). *E-learning new applications*. Dar Al-Fikr Al-Arabi.

Al-Jalahmi, H., & Al-Bashri, M. (2021). Designing an electronic training program based on the systems approach and measuring its effectiveness in developing electronic course design skills among faculty members at Princess Noura bint Abdul Rahman University. *Journal of Reading and Cognition*, (231), 103-145. https://dx.doi.org/10.21608/mrk.2021.140286

Al-Mousawi, A. (2010). E-training and its applications in developing human resources in the education sector in the Gulf countries. *The first symposium on applications of communications and information technology in education and training,* King Saud University, Riyadh.

Al-Mutairi, M. (2023). The extent to which primary school teachers have the digital skills necessary for distance teaching in light of the digital transformation in the State of Kuwait. *Educational and Psychological Studies*, (122), 251 - 297. https://doi.org/10.21608/sec.2023.287640

Al-Najjar, H. (2016). The effectiveness of combining and integrating the Moodle system and Web 2.0 tools in providing female students at the College of Education at Al-Aqsa University with the concepts of educational and information technology and the attitude towards it. *Educational Technology - Studies and Research: Arab Society for Educational Technology,* (26), 1-41. https://search.mandumah.com/Record/844227

Al-Rahili, T., & Al-Omari, A. (2020). The effectiveness of using some electronic support applications on developing digital empowerment among general education teachers considering educational design quality standards. *Journal of Educational and Psychological Studies - Sultan Qaboos University, 14*(2), 206-228. https://doi.org/10.53543/jeps.vol14iss2pp206-228

Al-Rashidi, H., & Mubariz, M. (2020). An electronic training program based on the Moodle learning management system to provide computer teachers with the skills of designing a cognitive journey strategy via the web. *Arab Studies in Education and Psychology,* (126), 165-192. https://doi.org/10.21608/saep.2020.116596

Al-Shahrani, M. (2022). The degree of availability of digital skills necessary to use the Madrasati platform in teaching science among middle school teachers in the city of Najran. *Arab Journal of Specific Education*, (22), 437 - 469. https://doi.org/10.21608/ejev.2022.233132

Al-Yami, H. (2020). A proposed training program to develop the digital teaching skills of general education teachers in the Kingdom of Saudi Arabia. *Journal of Education (Al-Azhar), 39*(185), 11-61. https://doi.org/10.21608/jsrep.2020.84441

Askalani, A., Saleh, I., & Mohamed, M. (2018). Interactive classroom management skills among teachers of people with special needs. *Journal of Research in Specific Education, 3*(17), 85-118. https://doi.org/10.21608/jedu.2018.107670

Basantes-Andrade, A., Cabezas-González, M., & Casillas-Martín, S. (2020). Digital competences in e-learning. Case study: Ecuador. In A. Basantes-Andrade, M. Naranjo-Toro, M. Zambrano & M. Botto-Tobar (Eds.), *Technology, sustainability*

and educational innovation (TSIE) (pp. 85-94). Advances in Intelligent Systems and Computing, 1110, Springer. https://doi.org/10.1007/978-3-030-37221-7_8

Benta, D., Bologa, G., Dzitac, S., & Dzitac, I. (2015). University level learning and teaching via e-learning platforms. *Procedia Computer Science,* (55), 1366-1373. https://doi.org/10.1016/j.procs.2015.07.123

Bovy, R. (1981). Successful instructional methods: A cognitive information processing approach. *ECTJ 29*, 203–217 https://doi.org/10.1007/BF02766716

Campion, R., Nalda, F., & Rivilla, A. (2012). Web 2.0 and higher education: its educational used in the university environment. *European Journal of Open – Distance and E-Learning,* (2), 1-18. https://eric.ed.gov/?id=EJ992491

Cavus, N. (2015). Distance learning and learning management systems. *Social and Behavioral Sciences,* 191, 872-877. https://doi.org/10.1016/j.sbspro.2015.04.611

Chen, S., Wang, J. (2021). Individual differences and personalized learning: a review and appraisal. *Universal Access in the Information Society, 20*, 833–849. https://doi.org/10.1007/s10209-020-00753-4

Chicioreanu, T., & Cosma, I. (2017). I am a teacher in the digital era. What to choose: Google classroom or moodle? *The International Scientific Conference Elearning and Software for Education*. National Defence University.

Corpus, D. (2020). Learning management system to enhance the research capability of public-school teachers. *International Journal of Advanced Trends in Computer Science and Engineering,* *9*(1.2), 127-131. https://doi.org/10.30534/ijatcse/2020/1991.22020

Donya, H. (2020). The effectiveness of using Google virtual classroom to develop the academic achievement of a study unit in the automated indexes course for third-year female students in the department of libraries, documents, and information at the Faculty of Arts, Tanta University. *International Journal of Library and Information Science, 7*(3), 42-87. https://doi.org/10.21608/ijlis.2020.121356

El-Batea, H., & Abu Khatwa, E. (2012). *Digital e-learning: theory - design - production.* Dar Elgameah.

Elmabaredy, A., Elkholy, E., & Tolba, A. (2020). Web-based adaptive presentation techniques to enhance learning outcomes in higher education. *Research and Practice in Technology Enhaced Learning, 15*. https://doi.org/10.1186/s41039-020-00140-w

Gilbertson, L., Rowe, J., Kim, Y., Chan, C., Schemm, N., & Unhoch, M. (2021). An online training program to enhance novice researchers' knowledge and skills. *Scholarship and Practice of Undergraduate Research Journal, 4*(4). https://doi.org/10.18833/spur/4/4/4

Gomah, E. (2020). Developing graduate studies programs at the Faculty of Education at Suez University in light of the requirements for achieving Egypt's Vision 2030: A future study. *Faculty of Education Journal,* (32), 36 - 117. http://search.mandumah.com/Record/1114635

Gunawan, G., Sahidu, H., Susilawati, S., Harjono, A., & Herayanti, L. (2020). Learning management system with Moodle to enhance creativity of candidate physics teacher. *Journal of Physics: Conference Series*, 1417. https://doi.org/10.1088/1742-6596/1417/1/012078

Hassounah, E. (2020). The extent to which computer and technology teachers in the digital skills of the 21st century in the schools of Gaza city. *International Journal of Research in Educational Sciences, 3*(1), 457-488. https://doi.org/10.29009/ijres.3.1.11

Hefter, M. (2023). Web-based training and the roles of self-explaining, mental effort, and smartphone usage. *Tech Know Learn 28,* 1079–1094. https://doi.org/10.1007/s10758-021-09563-w

Ibrahim, W. (2019). The effectiveness of Google educational applications on developing digital skills and self-efficacy among student teachers. *Arab Journal of Specific Education,* (7), 75-113. https://ejev.journals.ekb.eg/article_42385.html

Ismail, S. (2021). ICT curriculum after COVID-19: Implications of international experiences and the impact of ISTE standards. In S. Al-Maamari (ed.) *Curriculum development in light of Covid_19*: Foresight from the heart of the pandemic (pp. 123-151), Amman.

Khamis, M. (2015). *E-Learning resources: Part one: Individuals and media.* Dar Al-Sahab for Publishing and Distribution.

Koura, A., & El-Mansi, H. (2023). Artificial intelligence potential in preparing teachers: Challenges and opportunities for sustainable development in the light of 2030 vision. *Journal of the Faculty of Education, Al-Arish University, 11*(33.1), 232-265. https://doi.org/10.21608/foej.2022.180281.1168

Maddison, T., Doi, C., Lucky, S., & Kumaran, M. (2017). Literature Review of Online Learning in Academic Libraries. In T. Maddison & M. Kumaran (Eds). *Distributed*

learning: pedagogy and technology in online information literacy instruction, 13-46. https://doi.org/10.1016/B978-0-08-100598-9.00002-7

Martin, F., Michele, A., Parker, M., & Deale, D. (2012). Examining interactivity in synchronous virtual classrooms. *International Review of Research in Open and Distance Learning, 13*(3), 227-260. https://doi.org/10.19173/irrodl.v13i3.1174

Ministry of Planning and Economic Development. (2022). *National agenda for sustainable development:* Egypt Vision 2030. https://mped.gov.eg

Nadeak, B. (2020). The effctiveness of distance learning using social media during the pandemic period of COVID-19: A case in Universitas Kristen Indonesia. *International Journal of Advanced Science and Technology, 29*(7), 1764-1772. http://sersc.org/journals/index.php/IJAST

Purnama, H., Wilen, I., & Jabar, C. (2023). Web-based e-learning in elementary School: A systematic literature review. *International Journal on Informatics Visualization, 7*(3), 749-759. http://dx.doi.org/10.30630/joiv.7.3.1203

Rabie, A., & Al-Salami, Z. (2010). Designing a model of cognitive apprenticeship based on web 2.0 applications in an electronic learning environment and its impact on cognitive achievement and the skills of discussing and interpreting statistical results among female graduate students and their opinions about it. *Journal of Educational Technology, 20*(2), 61-129. https://search.mandumah.com/Record/622916

Salman, M. (2016). *The effectiveness of a training program based on cloud computing applications in developing mobile learning skills for computer teachers* [Master thesis]. Mansoura University.

Sdsegypt. (2023). *Sustainable development strategy: Egypt Vision 2030*. http://sdsegypt2030.com

Shaheen, A. (2019). A proposed vision for developing the skills of using Google applications in professional learning communities among teachers and educational supervisors. *International Specialized Educational Journal, 8*(11), 1-29. https://www.doi.org/10.36752/1764-008-011-001

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology and Distance Learning, 2*(1). http://itdl.org/Journal/Jan_05/Jan_05.pdf

Simanullang, N., & Rajagukguk, J. (2020). Learning management system (LMS) based on Moodle to improve students learning activity. *Journal of Physics: Conference Series, 1462*, 1-8. https://doi.org/10.1088/1742-6596/1462/1/012067

Songkram, N., Chootongchai, S., Osuwan, H., Chuppunnarat, Y., & Songkram, N. (2023). Students' adoption towards behavioral intention of digital learning platform. *Education and Information Technologies, 28*, 11655–11677. https://doi.org/10.1007/s10639-023-11637-4

Susilana, R., & Pribadi, B. (2023). Constructive online feedback to enhance learning achievement of open and distance students. World Journal on Educational Technology, 13(3), 514–528. https://doi.org/10.18844/wjet.v13i3.5959

Sweidan, A. (2010). Developing some general diploma courses in distance education in light of e-learning standards. *Studies in Curriculum and Teaching Methods,* (158), 201-158. http://search.mandumah.com/Record/51820

Tolba, A (2011). The impact of designing an e-learning strategy based on the combination of active learning methods via the web and self-regulation skills for learning on both achievement and self-regulated e-learning strategies and developing reflective thinking skills. *Journal of the Faculty of Education, 2*(75), 249-316. https://search.mandumah.com/Record/82376

Tolba, R. (2016). Designing an electronic training program based on cloud computing to develop the skills of using Google educational applications and the attitude towards them among faculty members in colleges of technology. *Journal of Arab Studies in Education and Psychology*, (69), 53-84. https://doi.org/10.21608/saep.2016.56282

Ukah, J. (2020). Towards the acquisition of digital instructional resources for effective teaching in the 21st century classroom in public secondary schools in Cross River state. *International Journal of Curriculum and Instruction, 12*(1), 339-350. https://ijci.globets.org/index.php/IJCI/article/view/377

UNESCO. (2019). *UNESCO ICT competency framework for teachers*. United Nations Educational, Scientific and Cultural Organization https://ar.unesco.org

Waly, M. (2023). The role of modern technology in achieving sustainable development in light of Egypt's Vision 2030. *International Journal of Contemporary Educational and Human Sciences, 2*(1). http://search.mandumah.com/Record/1333794

Wang, Q. (2009). Designing a web-based constructivist learning environment. *Interactive Learning Environments, 17*(1), 1-13. https://www.doi.org/1080/10494820701424577

Yelubay, Y., Seri, L., Zhorobekova, D., Utemuratova, A., & Zhumagulova, D. (2020). Digital competencies as necessary requirements for successful professional teachers in future. *Talent Development and Excellence, 12*(1), 1015-1028.

Ziada, R. (2021). Attitudes of general education students towards using virtual classes, Google Classroom, in education (Palestine as a model). *Virtual International Conference on Education in the Arab World: Problems and Solutions*, January 22-26, (pp. 127-138), Riyadh.