DEVELOPING A VIRTUAL EDUCATIONAL ENVIRONMENT BASED ON DISTANCE LEARNING NEEDS TO ENHANCE CREATIVE TEACHING ABILITIES FOR SCIENCE TEACHERS IN THE CITY OF HA'IL

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Abstract

The objective of this study was to develop a customized virtual learning platform specifically designed for distance education with the goal of improving the pedagogical abilities of science instructors at Hail University. The research used a descriptive analytical method, including expert assessments of the requirements for remote education and the necessary teaching abilities. A survey was conducted among 120 science teachers in Hail, and it was found that there is a significant need and value for training in several aspects of innovative teaching. The results emphasized substantial requirements in five crucial domains: innovative instruction as well as competencies associated with fluency, adaptability, and ingenuity. The virtual learning environment created for Hail Science instructors had a comprehensive evaluation by training program professionals using a unique assessment method. This evaluation ensured that the design of the environment included both technological and pedagogical criteria.

Keywords: teaching creativity; e-learning; environment design; design overview; expert survey.

1. Introduction

The learning process has been greatly modified by technological advancements, namely in e-learning tools and methodologies. These improvements use computers, satellites, internet-based resources, and many types of electronic material, including written and spoken words, graphic components, and audio-visual backdrops. This methodology allows learners to study at their own discretion, improving self-directed learning, increasing engagement, and efficiently and successfully fulfilling learning objectives (Abdel Moneim, 2010).

E-learning tools have facilitated the realization of immersive experiences like those we envision when perusing a book, such as the exploration of castles or spacecraft. This is achieved by integrating diverse disciplines like anatomy, biology, physics, and computer science. Within critical sectors such as healthcare, these technologies have a vital function in the enhancement of training and the acquisition of expertise, since possessing technical competency might be a matter of life and death (Metwally, 2007).

The educational system has undergone transformation in response to the emergence of information and communication technology (ICT). This progress has resulted in the creation of electronic educational programs that address the cognitive, skill, and emotional dimensions of learning. In addition, they decrease the amount of time required for learning, improve skill level, and empower

students to manage their own learning process (Rabee, 2008; Metwally, 2007; Amin, 2012; Abdel Moneim, 2010).

The significance of innovative instruction is growing, particularly for educators in the field of science. It encompasses the process of devising, executing, and assessing instructional techniques to enhance student acquisition of knowledge and expression of originality (Davies, 2006; Jeffrey and Craft, 2004; Abu Sweirah, 2009; Filmban, 2004). The phases of creative teaching include the processes of planning, executing, and assessing (Mahmoud, 2018; Al-Qarni, 2012; Yahya, 2013). Multiple studies have investigated the correlation between innovative pedagogy and the proficiency of educators, as shown by Al-Najjar (2010), Al-Qarni (2012), Yahya (2013), AL Agha (2015), Al-Zind and Al-Shatnawi (2016), and Aljamal and Astal (2017). They emphasize the need for implementing training programs aimed at cultivating instructors' innovative pedagogical abilities.

Virtual reality is crucial in distant learning since it offers immersive and engaging experiences. In the contemporary context, characterized by events such as the COVID-19 epidemic, it is crucial for instructors to possess proficient e-learning abilities (Hamutoglu, 2020; Haitham, 2018; Al-Hunaiti, 2004; Hajji, 2003; Al-Kilani, 2006; Al-Hadi, 2005; Istitiah and Sarhan, 2018; Metwally, 2007).

The virtual classroom, a result of the internet, revolutionizes conventional teaching techniques and facilitates various educational tools and materials (Coveney and Highfield; Al-Baz, 2001; Shaqour, 2006; Salem, 2018; Abu Fakhr, 2012; Al-Radi, 1429). This approach enables students to acquire knowledge at their own speed and provides a diverse range of learning opportunities from renowned institutions, combining cultural aspects with worldwide scientific material.

1.1 Problem Statement

Through conducting interviews with science teachers across different academic institutions, researchers have uncovered notable deficiencies in their expertise and competencies pertaining to innovative pedagogy and remote education. The inadequacies were seen in several aspects, including the management of online classrooms, video conferencing, handling educational satellite channels, internet utilization, email competency, software downloading, web page design, program analysis, and facilitating online discussions.

The researchers noted a dearth of studies that specifically addressed the creation of virtual environments for science instructors at the College of Education. These studies are intended to enhance the teachers' creative teaching abilities via distance learning. The research found important concerns:

1. Insufficient availability of instructional information in simpler software forms results in a shortage of teaching abilities and inventiveness.

2. The lack of a mechanism to evaluate students' requirements across many fields for educational software aimed at improving e-learning and remote learning.

One common drawback among science instructors is their limited ability to effectively use adaptive virtual educational environments and educational technologies.

In order to tackle these concerns, the researchers formulated the primary inquiry as follows: "In consideration of the demands of distance learning, how can a virtual learning environment be devised to enhance the pedagogical aptitude of Science educators in Hail?" Additional sub-questions that are derived from the main question include:

1. What are the prerequisites for establishing a virtual learning environment for science instructors at Hail?

Which innovative teaching abilities should science instructors at Hail cultivate?

What are the training requirements for science teachers in Hail, as identified by experts, particularly in relation to innovative teaching skills?

What are the specific requirements for creating a virtual learning platform that enhances the ability of science instructors in Hail to improve their innovative teaching skills?

What is the suggested virtual learning platform for developing these skills?

The significance of this study lies in its capacity to elucidate the procedure of developing a virtual learning environment that aligns with the demands of distance learning. This, in turn, may augment the pedagogical abilities of science instructors with diverse specialties, particularly in fostering creativity.

- Emphasize the importance of using adaptive virtual learning environments to enhance the academic accomplishment and skill proficiency of students engaged in remote learning.

- Submit a proposal for a virtual learning environment that aims to provide efficient assessments for evaluating cognitive elements and skill proficiency in e-learning among students from diverse specialties.

The objective of the research is to identify the most effective distant learning techniques for science instructors with various specialties. This will improve their expertise and proficiency in the area, and provide valuable guidance, ideas, and hands-on activities for implementing e-learning tactics.

1.2 Research Objectives
The main emphasis of this work is on five essential objectives:

1. Identifying the necessary distance learning needs to create a customized virtual learning environment that will improve the creative teaching abilities of science instructors in Hail.

2. Defining the essential standards for creating a flexible virtual learning platform that meets the needs of distance learning with the aim of fostering innovative teaching abilities in science educators in Hail.

3. Identifying the precise creative teaching qualities that need improvement among science instructors in Hail.

Evaluating the educational requirements of science teachers in the field of innovative instruction.

5. Creating a virtual learning platform that meets the needs of distant learning with the goal of enhancing the innovative teaching abilities of science educators in Hail.

1.3 Study Approach

The study used a descriptive analytical technique to elucidate, scrutinize, and evaluate the current literature, research, and prior investigations. Furthermore, this method was used to create a virtual learning platform specifically designed to meet the needs of distance learning. The aim was to enhance the science instructors' innovative teaching abilities in Hail. The study's limits were centered upon the development of a virtual learning environment, following the particular requirements outlined by the General Model of Instructional Design (ADDIE). This involves examining and developing innovative teaching abilities in several areas, such as planning, executing, and assessing, as well as qualities like fluency, creativity, and adaptability, along with numerous creative teaching methods.

1.4 Operational Definitions of Terms

- A "virtual learning environment" refers to an electronic platform designed and overseen for the purpose of distant learning, providing knowledge and resources. Science professors at Hail University may use it to actively gain information and teaching abilities in a creative manner within their specific field. This promotes e-learning by encouraging changes in behavior that are in line with educational objectives.

- Distance learning is defined as a versatile educational approach that is not limited to certain resources, schedules, locations, or student demographics. It is in accordance with the requirements and desires of society, facilitates the growth of professional skills, and enhances educational possibilities by using multimedia and contemporary educational technology.

- The term "creative teaching skills" refers to a collection of behaviors that a science teacher at the University of Hail should possess and effectively use. These talents cultivate a creative learning environment throughout the process of planning, implementing, and evaluating, characterized by the ability to generate ideas easily, adapt to different situations, and come up with unique solutions. The evaluation of these talents is conducted using a particular scoring system.

2. Theoretical Framework

This research examines the idea and structure of virtual reality environments for educational use, specifically in the field of science education at Hail University. Salient aspects comprise:

Virtual reality in education refers to the use of computer technology to create interactive environments in sectors such as medicine, engineering, and education. Users are able to fully engage in either actual or fictional environments in order to enhance their learning and build their skills (Abdel-Razek, 2007).

Virtual laboratories are seen as an expansion of conventional laboratories, where equipment and computers are linked to a network to conduct experiments remotely. Virtual laboratories are created according to global standards and educational ideas, using audio, video, and 3D graphics to replicate actual or hypothetical settings for scientific investigation (Shaqour, 2006; Abdul Karim et al., 2009).

Components of Virtual Laboratories:

- Devices and Equipment: Integrating conventional laboratory components with specialized devices for the purpose of data input and output.

- Automated computers: personal computers that are linked to local or worldwide networks for laboratory work.

- Communications Network: Ensures secure and high-quality digital communication for conducting distant tests.

- Virtual Lab Programs: Interactive simulation programs designed to provide exciting and instructive experiences.

- Management Programs: software applications designed to facilitate the management of laboratory utilization and the monitoring of student progress and experiment results.

Design Stages of Virtual Environments (Abdul Karim et al., 2009):

- Analysis Stage: This involves determining the characteristics of the learners, their goals, the educational materials, and their degree of accomplishment.

During the design stage, one must choose appropriate delivery methods, learning settings, and lesson content.

- Development Stage: Integrating many media sources and creating interactive exercises.

- Implementation Stage: The process of arranging and evaluating the environment while also preparing backup plans for any potential technological problems.

- Evaluation Stage: Analyzing the program's effectiveness and gauging the satisfaction of the learners.

This method highlights the significance of virtual reality in enriching the educational experience by offering immersive and interactive settings for both learners and instructors in the realm of science.

2.1 Distance Learning Environment

In his work, Abdel Wakeel (2000) delineates the fundamental technological prerequisites for the development of a proficient distant learning system:

1. A server computer with a large storage capacity and high processing speed is used to store course-related data. Either the institution or a distance learning service may host this server.

This configuration involves substantial expenses for installation, upkeep, and internet access.

2. Another cost-effective option is to lease server space from a specialized server hosting provider.

3. The system allows programmers to connect to the central server, giving them the ability to develop interactive web pages using Common Gateway Interface (CGI) applications written in languages such as Visual Basic and Perl. These apps enable the transfer of data between users and the central server.

It is essential to have access to software tools like Web page editors, FTP, and Telnet. Teachers should possess expertise in using these tools, especially HTML for creating web pages.

5. Provision of internet connections to students for the purpose of connecting to a server.

6. The internet link should have a high bandwidth, particularly for systems that include video lectures. The speed should exceed 6.33 kilobytes and be equal to or faster than ISDN systems.

7. An extra piece of equipment, such as a video server, is required for systems that include visual content.

2.3 Literature Review

Several notable Arabic studies have focused on the topic of distant learning and virtual education, each adding to a more profound understanding of the difficulties and prospects in this quickly growing sector.

Al-Salman and Bawana's (2020) research looked into how Jordanian students felt about remote learning in the context of the COVID-19 epidemic. The research, conducted using an electronic questionnaire, examined the opinions of students in elementary and secondary schools. It found that attitudes towards distant learning were neither strongly positive nor negative. However, it identified notable obstacles in terms of internet connectivity, content development, and meeting the diverse needs of individual students. In order to tackle these problems, the research proposed enhancing internet access and providing training to educators and students on the proficient use of educational platforms.

Saleh (2020) conducted research on the standard of electronic services in the distance learning system at the Faculty of Education in Sohag. It analyzed viewpoints from both faculty members and students. The results suggested that the quality of e-services was deemed to be of a moderate level. The research observed that there were no substantial disparities in responses across genders or academic ranks among faculty members. However, it did identify variations in responses depending on academic rank and student specialty. As a result, it was suggested to establish a quality control department responsible for supervising and consistently enhancing the e-services provided by distance learning systems.

Al-Zahrani (2019) examined the efficacy of using Facebook as a virtual learning environment to enhance students' interaction skills at Princess Nourah bint Abdul Rahman University. The research found that students in the experimental group had higher competency in interaction skills compared to those in the control group as a result of engaging in a cognitive trip across the social network.

Salem (2018) conducted research to evaluate the effects of a virtual learning environment that used interactive learning on first-year preparation students. This study provided evidence that the use of such a setting substantially improved students' capacity for innovative thinking and their perspectives on computers and information technology.

In Aljamal's (2017) research, a training program was assessed with the objective of enhancing the innovative teaching abilities of mathematics instructors in basic education. The curriculum demonstrated its efficacy through notable enhancements in the instructors' aptitude for innovative pedagogy after the training.

Al-Zind and Al-Shatnawi (2016) conducted research on the inventive teaching skills of vocational education instructors in Jordan. The findings indicated that these teachers demonstrated a satisfactory degree of creative teaching practice. The research also emphasized disparities in these abilities according to gender and academic credentials, underscoring the intricate character of innovative pedagogical methods in diverse settings.

Al-Agha's research in 2015 investigated the efficacy of a training program for mathematics teachers at the secondary level in enhancing their ability to teach creatively and the resulting influence on their students' creativity. The findings were encouraging, demonstrating a significant improvement in instructors' competencies and a favorable impact on student ingenuity.

Collectively, these studies provide unique perspectives on the many dimensions of remote learning and virtual education, emphasizing the need for high-quality electronic services, efficient training initiatives, and adaptable teaching approaches to address varied learning requirements.

Recent research in the domain of virtual learning environments (VLEs) and online education has made substantial contributions to comprehending their influence on many educational facets.

Using the ISO/IEC 40180 framework and the aid of information technology, Shraim (2020) concentrated on establishing precise standards for excellence in online education. By examining 72 articles spanning from 2000 to 2019, the research identified the lack of a comprehensive quality framework for open education. However, it acknowledged that the ISO/IEC 40180 framework is well-suited for educational enterprises.

Hamutoglu, Gemikonakli, and Kirksekiz (2020) conducted an assessment of students' encounters with virtual learning environments (VLEs) at Middlesex University. The research, which included 278 students, used a scale to gauge perceptions of interest, contentment, and orientation. The findings revealed that there were no notable disparities in impressions depending on university location or educational level. Furthermore, recorded lectures and videos were identified as the most advantageous aspects.

In his 2019 study, Ahmed examined the impact of a novel virtual learning platform on improving students' abilities to create and deliver online virtual lectures (OVLs). The research, including a cohort of 30 university students in their final year, demonstrated that the platform significantly enhanced the students' understanding and proficiency in OVL design and production.

Jantakoon, Wannapiroon, and Nilsook (2019) sought to develop a theoretical and design framework for virtual immersive learning environments (VILEs) that is rooted in digital storytelling. Their study presented a comprehensive framework that includes immersive technology, digital storytelling, narrative assessment, and deeper learning, as well as cognitive, interpersonal, and personal support.

These works jointly enhance the comprehension of virtual learning environments (VLEs) in several circumstances. The aims of the present research are in line with those above, but it varies in its methodology by specifically examining the influence of the virtual learning environment on the creative teaching abilities of science instructors at Hail. The studies exhibit diversity in their samples, including a range of participants, including students, instructors, and documents. Furthermore, they utilize a variety of methodologies, with some using descriptive analytical methods while others adopting experimental approaches. The studies use various tools, such as questionnaires, observation cards, scales, and tests, to gather data, showcasing the wide range of data collection techniques in this discipline.

3. Research Field Study

This research used an improved inventory of training requirements, which took into account input from experts, to evaluate the specific needs of science instructors at Hail University in terms of remote learning and innovative teaching abilities during the academic year 1442/2021. The sample consisted of 40 science instructors from scientific faculties and 80 from theoretical faculties. The aim was to assess their subjective need (whether they deemed it necessary or not) and the significance (significant, somewhat significant, or insignificant) of each component of the training. The replies were evaluated using the Likert scale to ascertain the ranking of each item in the questionnaire, offering valuable insight into the distinct training requirements and priorities of the science instructors.

TABLE 1 The arithmetic average significance scale for calculating the degree of need

Arithmetic average		Agreement rate
From	To	
1	1.50	Don't Need It
1.51	2	Need it

Furthermore, an examination of the categories inside the questionnaire reveals the training requirements for enhancing creative teaching abilities in several subject areas. The questionnaire was designed to assess the training requirements of science instructors in the study sample. It consisted of five key topics, and the following presentation provides an overview of the findings for these themes as a whole, as shown in Table 2:

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TABLE 2 Agreement rate on fields as a whole and the questionnaire in total (from the research sample point of view) (N=120)

Field	No. of indicators	Needing Rate					Importance rate				
		Arithmetic average	Standard deviation	%	Need rate	Rank	Arithmetic average	Standard deviation	%	Need rate	Rank
Planning for creative teaching	12	1.960	0.07	98%	Need it	2	2.984	0.18	96.47%	Important	3
Implementation of creative teaching	16	1.962	0.06	98.10%	Need it	1	2.906	0.16	96.78%	Important	1
Evaluation of creative teaching	11	1.946	0.12	97.30%	Need it	3	2.897	0.26	96.57%	Important	2
Creative teaching skills associated with fluency	7	1.876	0.20	93.8%	Need it	5	2.724	0.42	90.80%	Important	5
Creative teaching skills associated with flexibility and originality	10	1.907	0.19	95.35%	Need it	4	2.832	0.37	94.40%	Important	4

Table (2) indicates that the training need for creative teaching abilities varied among its five domains, ranging from 1.876 (equivalent to 93.8%) to 1.946 (equivalent to 97.30%). The implementation abilities of innovative instruction ranked highest. The significance level ranges from 2.724 with a 90.80% proportion to 2.906 with a 96.87% rate. Implementation abilities ranked highest, affirming their value at the professional level.

4. Results and Discussion

A thorough examination of the training requirements of science instructors in many parts of innovative instruction was undertaken by the research carried out at Hail University. The results emphasized a significant need for instruction in the areas of planning, execution, assessment, adaptability, versatility, and innovation abilities in the realm of innovative instruction.

The survey identified a pronounced need for training in planning and execution skills, with rates above 98%. These talents are crucial for establishing a captivating and innovative learning atmosphere and are vital for successful teaching methodologies.

Furthermore, the study demonstrated a significant need for instruction in assessment abilities and proficiency in innovative pedagogy. Although the significance of fluency skills was not given as much emphasis, it nonetheless remained a key area for improvement among science instructors.

Furthermore, the survey revealed a significant need for training in abilities pertaining to adaptability and creativity. The talents in this field were greatly valued in terms of need and significance, emphasizing their applicability in modern educational situations.

In response to the highlighted demands, the research suggested the implementation of a virtual learning environment (VLE) specifically tailored to improve the creative teaching abilities of science instructors in Hail. This virtual learning environment (VLE) is designed to meet the needs of distance learning. Its primary objective is to enhance a range of abilities, such as planning, executing, assessing, and practicing, that are essential for creative teaching. These skills specifically focus on fluency, originality, and flexibility.

The pedagogical framework of this suggested training program is based on the El-Desouki and Mustafa (2015) approach. This model is very appropriate for the Virtual Learning Environment (VLE) because of its extensive scope, which includes all aspects of educational design and development, and its flexibility to accommodate different educational levels and situations. The suggested training program at Hail University benefits from the model's adaptability and its emphasis on ongoing improvement, making it a very effective framework for improving teaching approaches.

The following is a presentation of the form of the instructional design model.
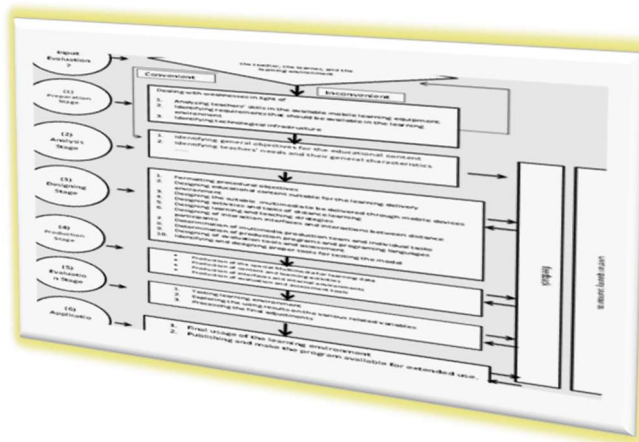
MODEL 1

The instructional design approach developed by El-Desouki and Mustafa (2015) was used in the creation of the experimental treatment material for the training program at Hail University. This method had many steps, each of which was crucial for the formulation of an efficient training program aimed at boosting the creative teaching abilities of science instructors.

Initial Phase: Prerequisites for Trainers and Training Programs

The first phase was determining the prerequisites for trainers and the training curriculum within the framework of distance learning. This entailed verifying the trainers' competence in utilizing contemporary educational tools, their ability to resolve issues in e-learning settings, and their familiarity with computers, phones, and internet usage. • The program prerequisites were established considering the accessibility of electronic learning devices and internet connectivity, guaranteeing that both trainers and trainees could actively engage in the training.

Preparation Stage

The preparation stage catered to the requirements of both instructors and learners. The trainers, who were themselves researchers, prioritized fulfilling the pre-established criteria.

Trainees were required to analyze their experiences with electronic learning devices to ensure they had the requisite skills for active engagement in the program.

The necessary technical infrastructure for e-learning was also determined, which includes the use of personal devices and access to the internet.

During the analysis stage, the training's overarching goals were established, with a specific emphasis on developing innovative teaching abilities that align with the demands of distant learning. The main subjects addressed were the development and execution of innovative teaching techniques, strategies for remote learning, and methods for assessing progress.

Design Stage

During the design stage, procedural goals were developed based on the identified primary creative teaching abilities. The objectives were formulated using quantifiable behavioral parameters, guaranteeing clarity and concentration in the training aims.

The training's objectives and goals were revised and completed in collaboration with a panel of professional arbitrators, guaranteeing its relevance and practicality.

The training program aims to cultivate a complete and efficient strategy to increase the creative teaching abilities of science professors at Hail University, in line with contemporary demands of remote learning, throughout these phases.

4.1 Designing the Training Content for a Proposed Training Program

Based on the previously established goals, the researchers determined the specific subjects to be included in the training program. They then compiled the content by examining various previous research, studies, and electronic publications. Subsequently, the researchers created a set of criteria to guide the design of the proposed training program, taking into consideration the specific demands of distance learning.

Consequently, five primary subjects for the content of the suggested training program were determined:

Effective strategies for designing innovative instructional plans.

Skills required for effectively implementing innovative distance education and their quantity.

Methods for remote education.

Process of assessing distance.

The quantity of innovative teaching techniques and their respective counts.

TABLE 3 schedule of the training program sessions

No.	Day and Topic	No. of sessions	No. of hours
1	Day 1 opening session	1	1
2	Day 1 planning for creative teaching	2	3
3	Day 2 implementation skills for distance creative teaching	2	3
4	Day 3 teaching strategies in light of distance learning requirements	2	3
5	Day 4 evaluation methods for distance learning	2	3
6	Day 5 creative teaching skills	2	3
Amount of days and sessions		11 sessions	16 ours

2- Designing appropriate multimedia for presentation via e-learning devices:

The media used in the proposed training program was assessed with regard to the visual, audiovisual, and textual demands of remote learning. The researchers outlined certain technical criteria in Annex 3 of the virtual learning environment to develop electronic training programs, taking into account the needs of distant learning. The researchers used each of the following:

TABLE 4 the used multimedia

No.	Topic	Suitable multimedia
1	Planning skills for creative teaching	Text, Video, Images
2	Implementation skills for creative teaching	Text, Video, Images
3	Distance learning strategies	Text, Video, Images
4	Distance evaluation process	Text, Video, Images
5	Creative teaching skills	Text, Images
6	Fluency skills for creative teaching	Text, Images

The training program for science instructors at Hail University was designed with a primary emphasis on cultivating innovative teaching abilities within the framework of remote education. The e-training technique consisted of many essential elements:

1. A pre-assessment to gauge the trainee's prior knowledge precedes the delivery of information using multimedia elements like texts, photos, and videos in the first phase of the training process. This strategy sought to accommodate a wide range of learning styles and preferences.

2. The program included constructive assessments with feedback tools and a post-exam. The purpose of these evaluations was to evaluate the trainees' comprehension and mastery of the material, thereby promoting efficient learning.

3. The program interfaces and interaction patterns were meticulously crafted after a thorough examination of many e-learning settings and digital content creation standards. The objective was to develop captivating and interactive training modules that would enhance the process of acquiring knowledge and skills. Crucial elements of the encounter encompassed:

- Suspense and Attraction Factor: The program used captivating introductions and visually appealing design elements, such as harmonized text color and size, illustrative photographs, and videos, to actively involve the trainees.

- Trainees actively interacted with the content by participating in activities inside the training program and getting rapid feedback. This interactive method included using search engines and completing assessments after each lecture, promoting active engagement in the learning process.

- Learner-Teacher Interaction: The software promoted engagement between learners and instructors via conversations, inquiries, and the option to communicate with trainers via email, therefore enriching the learning process.

4. Design and navigation of the main screen in the training program: The primary interface of the proposed training program was intentionally created to be intuitive, with hyperlinks to other areas such as lectures, personal pages, messaging, and contact details. This design facilitated trainees' seamless navigation across the curriculum, enabling them to access a wide range of materials and interactive components.

In summary, the training program was carefully crafted to enhance the creative teaching abilities of science instructors in a remote learning setting, using contemporary e-learning concepts and interactive methods.

The training program at Hail University introduced two distinct forms of navigation inside the e-learning platform to improve the overall training experience for both learners and trainers:

1. Trainee Navigation: • Trainees use the training program by accessing the website http://eschooly.net/edu_env/index.php.

- The process starts with the user reading the instructions and enrolling in the program's lectures.

Trainees have the ability to access and move through the lectures, communicate with trainers via email, receive messages, and use the 'Contact Us' function for both direct and indirect contact.

The website is intended to provide seamless navigation between various information sections, delivering a user-friendly and adaptable learning experience.

2. Trainer Navigation: • Trainers may visit a distinct area of the website at http://eschooly.net/edu_env/admin/.

- This part includes features for overseeing trainee accounts, tracking their progress, interacting via email, and administering exercises and examinations.

The trainer's interface provides extensive control over course material and trainee engagement, including functionalities for course administration, lesson planning, and addressing trainee inquiries.

In addition, a multimedia production team was formed to create the training material, with a specific emphasis on database and web page design, as well as the incorporation of interactive assessments. This technique was customized to fulfill the distance learning prerequisites and focused on enhancing the innovative pedagogical abilities of Science instructors at Hail University.

The training program at Hail University aims to address the needs of distant learning and enhance the teaching abilities of Science instructors by focusing on particular production programs and programming languages. The selection of these tools was based on their appropriateness for developing multimedia material, enabling program testing, and improving distant learning abilities. The choice of these programs and languages was motivated by the need to efficiently design and execute a training program that corresponds to the contemporary educational requirements of Science instructors, guaranteeing a thorough and engaging online learning experience

TABLE 5 programs used in designing the proposed training program

No.	Program	Purpose
1	PHP	Programing language for dealing with interactive web pages
2	SQL	Programing language for dealing with data bases
3	Microsoft Expression Web	Program for designing and developing web pages
4	Wonder share quiz creator	Producing exercises, and tests for self- presentation within the training content
5	Microsoft Word 2010	Writing content texts and formatting them to comply with the training environment
6	Internet Explorer Or Fire fox	Web browser enables reaching the multilevel training environment

During the creation stage of the training program at Hail University, four essential phases were implemented:

1. Multimedia Production: Texts, photos, and videos were generated according to customized criteria designed for the training setting. The purpose of these multimedia features is to enhance the educational experience in the e-training setting.

2. The researchers created interactive interfaces to facilitate communication between trainers and trainees. The interfaces were meticulously designed according to defined design guidelines and included crucial elements such as a homepage, lectures, personal pages, chat functionality, and contact details. The primary objective of this design was to enhance communication and control in the training program, ensuring a seamless and participatory distant learning experience.

The following diagram illustrates the user's interaction.

Figure 2 User Interaction Destination

The establishment of the training curriculum at Hail University included the careful execution of many phases.

1. Navigating Tool Design: The primary page of the training program was furnished with hyperlinks to facilitate seamless navigation inside the curriculum. An exclusive communication toolbar was developed specifically to meet the needs of learners engaged in distant learning.

2. Trainer Interaction Interface: A specialized interface was developed for trainers, allowing them to oversee trainee information, lectures, exams, outcomes, and communication via

electronic messaging. This interface enables efficient supervision and communication between instructors and learners.

3. Evaluation Stage: The training program underwent a comprehensive evaluation procedure, with professionals in the area reviewing and arbitrating the contents and methodologies to assure their quality and applicability.

4. Implementation Stage: This concluding phase included the practical execution of the training program. The program was made available to trainees at anytime and anywhere using the website http://eschooly.net/edu_env/index.php. The procedure included the publication of training material, the administration of final examinations for trainees, and the execution of statistical analyses to assess the results.

In summary, these processes guaranteed the development of a training program that was both efficient and easily accessible. The program was specifically created to improve the innovative teaching abilities of science instructors at Hail University using contemporary e-learning techniques and resources.

5. Recommendations

➢ There is a strong suggestion to improve virtual classrooms for science instructors to facilitate innovative teaching, with a specific emphasis on incorporating the needs of distance learning.

➢ Identification and development of training needs are essential in order to discern the unique requirements for training among science instructors. The primary emphasis should be on enhancing their creative teaching abilities via the use of virtual learning environments.

➢ Training programs focused on designing virtual educational environments are essential for science instructors from all disciplines. These programs aim to provide teachers with the skills and knowledge needed to create and effectively manage adaptive virtual educational environments.

5.1 Research Suggestions

❖ A future study might examine the effects of building virtual learning environments on improving creative thinking abilities in university students.
❖ One potential research subject is to develop a clear understanding of virtual classrooms and examine how they impact students' knowledge of technological advancements in scientific fields.
❖ An investigation of the efficacy of training programs in building electronic courses and their influence on cultivating creative thinking abilities among student instructors in colleges of education might provide significant insights.

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