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E-learning competencies among preparatory stage physics teachers

Huda Hamad Abd Al-Jobory

Qadisiyah University – Faculty of Education

Corresponding author email: edu-sycho.post67@qu.edu.iq

Prof. Mohsen Tahir Muslim Al-Mousawi

Qadisiyah University – Faculty of Education

Abstract---The current research aims to identify: (E-learning competencies among preparatory stage physics teachers).The descriptive research method was used, and the research community was identified in the preparatory and secondary government day schools affiliated to the Directorate of Education of Babylon for the academic year 2021-2022 AD. The research sample included (300) male and female teachers, whom were chosen randomly among other (858) male and female teachers of the research community. The researcher prepared a tool to achieve the goal of the research , the measure of e-learning competencies in its final form, which has a number of (60) items , and the face validity of the study tool and its Reliability was verified in appropriate ways.The research tool was applied in the academic year(2021-2022) and after using the T-test equation for one sample to know the significance of the differences between the arithmetic average and the hypothetical average, it appeared that the calculated T-value is (3,71) greater than the tabular T-value of (1.65) at the significance level (0.05) and the degree of freedom(298), there is a statistically significant difference, and the following results were reached: - Physics teachers have a high level of e-learning competencies. Based on the findings , the researcher made a number of recommendations and proposals.

Keywords---physics teachers, e-learning competencies.

Research Problem

The current era is witnessing rapid progress in science, information, and technology in various areas of life , which has led to tremendous developments in the capabilities and methods provided by schools and educational institutions. These developments have caused the emergence of many problems that require

further development and progress. The teacher is one of the most important pillars to achieve the objectives of the stage. Therefore, the institutions attached great importance to the number of teachers and their training in the quality of good and modern programs on the one hand, and the training of the teacher on the new educational applications in order to upgrade it from the skill and intellectual side on the other hand. However, we see that the teacher is exposed to criticism from time to time when we look at the educational literature. We find that there are those who see a shortage in the professional side of the teacher due to its reliance on the traditional method of teaching (as in the study of Al Masoudi, 2021). It also indicates the weakness of training university students on modern software and techniques that make them able to keep pace with the revolution of knowledge and technology. Therefore, the faculties of education have to pay attention to the development of good programs and techniques so that students can train and practice on such programs when practicing the profession. To verify the existence of the problem, the researcher submitted a questionnaire to investigate the opinions of physics teachers for the preparatory stage to determine the extent of their knowledge of e-learning competencies. I found a variation in the results of the questionnaire and in light of the above, I started the idea of the current research, which the researcher identified her problem to investigate the following questions: -

- What are the competencies of e-learning among preparatory stage physics teachers ?

Research significance

The educational system in the current era is undergoing various challenges and changes as a result of the rapid progress in communication and information technology only. Technology has entered all elements and components of the educational process, including a learner, an educational material and a teacher, as well as teaching and learning methods and evaluation methods to all these elements and components, which forced educational institutions to absorb this technology with its pros and cons and to prepare plans and programs that can develop the awareness of individuals working with it and the information and innovations offered by this technology and push research and development efforts and reshaping educational systems in accordance with the requirements of employing this current and expected technology.

The teacher is the main pillar in the educational system on which all future hopes are based, which aims to improve the educational process. The attention and development that is attached to the level of the teacher leads to the growth and development of demand. The teacher is a leader who has a great impact on his students because he is the main and effective element in the process established by students as doctors, engineers, businessmen and other groups of society. Their backgrounds, knowledge, skills and behavior are greatly affected by the behavior of their teachers and the efforts made by these teachers throughout their years of education. Therefore, we find that scientists and those with skills in various areas of life have lived the educational experiences provided by distinguished teachers throughout their education, which has affected the building of their personalities and refinement of their thinking in a

way that enables them to excel and excel in their society. The teacher is an important element in the educational process (Al-Murjaj and others, 2007, 11, 12) It has become necessary to train teachers and acquire the competencies of computer use in education and that the teacher has the competencies of computer culture such as the use of search engines and the ability to download files to the Internet and download them from the network in order for the teacher to employ the computer skills he has acquired in the educational process and e-learning (Ismail, 2010, 9)

In this context, (Al zaboun 2018) states that the future teacher needs electronic competencies in their inherent form related to computer culture, which is the knowledge adequacy related to computer components and the principles of their work, and the adequacy related to the information culture of knowledge of information methods and sources. He also needs electronic competencies in their apparent form, which refers to the competencies related to computer skills and the competencies of dealing with Internet programs (the Internet) and their services, methods of using information sources and databases, and the design of electronic courses (the Al zaboun, 2018, 296). (Al-Halfawi, 2006) also indicates that there is a set of skills that the teacher should possess to ensure the success of e-learning, which are the competencies of managing electronic classes and conferences, dealing with the Internet, using e-mail, downloading programs and placing them online (Al-Halfawi, 2006, 12). However, the shift to e-learning of a synchronous and asynchronous quality has imposed on the teacher some roles that require him to be performed by the availability of competencies that include planning, implementation, evaluation, technology recruitment competencies and communication through e-learning, including dialogue, discussion and follow-up of students' work (Al-Omari, 2009, 11)

Research Objectives

The current research aims to identify:
e-learning competencies among preparatory stage physics teachers :

Research Limits The current research

Is limited to the following limits :

1. Spatial limits : The government schools of the Babylon Governorate Education Directorate.
2. Human limits : Physics teachers in the General Directorate of Education of Babylonian Governorate.
3. Temporal Limits: Academic Year 2021-2022.

Definition of Terminology

E-learning competencies: - Defined by

- (Jad, 2007) A set of knowledge, skills and trends for e-learning and its necessary uses in building the educational position easily and easily using

electronic means to achieve educational and educational goals (Jad, 2007,p. 92)

- (Shaheen, 2017) It is the set of knowledge, experiences and skills that the teacher possesses using the computer in teaching and the processes of preparing, developing and implementing teaching strategies that can be practiced with an acceptable level of efficiency and effectiveness (Shaheen, 2017, p. 615)

The researcher agrees with the definition of (Shaheen , 2017) and the researcher defines it procedurally as: -A set of performances that includes managing the interactive educational situation between the teacher and the student using electronic teaching methods in order to achieve the objectives of the teaching and is measured by the degree to which the teacher obtained his answer on the scale that was prepared for this purpose .

Theoretical Background and Previous Studies

Competencies Linguistically explained indicate the word sufficient in the language as stated by Al-Razi(1978, p. 591) of the verb(QFJ) is sufficient and it can be said that in its simplest form, it is the ability of the individual to do a work or task without the direct assistance of another party. However, he believes that it is not easy to provide a precise terminological definition of the word (Competence), but he provided clarification that its comprehensive meaning is that "it means the various forms of performance that represent the minimum necessary to achieve a goal"

Educational competencies In its general sense, means efficiency is the ability to practice work with multiple tasks, and this ability is the result of qualification and experience in the field of education, and educational efficiency is linked to the practice of the teaching profession, and includes the teacher, the director, the student counselor and the educational supervisor. Darawish (defined as: - It is the ability of the teacher to perform his educational tasks with a certain level of mastery that ensures the desired results in the behavior of learners (Darwish, 2000, 43)

(Zain DN, 2007) Described the educational adequacy in four concepts:

1. Sufficiency as behaviour: Doing specific, measurable things
2. Access to information: through the understanding of the information and skills that lead to the work of specific things subject to measurement
3. Degree of ability: i.e. the importance of reaching a certain degree of ability to work in light of specific criteria agreed upon
4. The quality of the individual: It means the measurable characteristics and personal qualities of the individual (Zainuddin, 2007 , 45)

Classification of educational competencies

The most appropriate classification of educational competencies has been agreed upon by many educational sources (Medkor, 2005) (Qandil, 2000) - (Kitch, 2001) and is represented in the following competencies:

1. Cultural competencies: These include scientific, social, religious, educational, health and economic aspects and local and global attitudes and problems .
2. "Educational" professional competencies by providing the teacher and the student teacher with applied theoretical experiences in various fields of the teaching profession, including curricula, teaching methods, pedagogy , learning theories, educational psychology , and the use of technology in education. Ibrahim (2007) adds that professional educational adequacy "aims to provide students and teachers with information and skills that enable them to carry out the teaching profession effectively and be able to understand his students, their tendencies and trends and how to implement the subjects in his field of specialization within the classroom."
3. Specialization competencies: The goal of specialized preparation is to provide the student teacher with a degree of experience that deepens the understanding of the scientific material in which he specializes and helps him to master her skills and the ability to employ her in the educational situation. (Medkor 2005,41-Qandil 2000,94-Kitch 2001,48_Ibrahim 2007,219)

E-learning competencies

Electronic competencies have known several definitions, and digital competency is the ability to explore and confront new technical situations in a flexible manner, analyze, select and evaluate data and information, exploit the potential of technology to solve problems or create knowledge in a participatory manner, and enhance awareness of responsibility and respect for rights, and mutual obligations. E-learning competencies are defined by Al-Zahrani (2012) in the set of knowledge and skills aspects of e-learning that oblige the teacher to the roles due to him so that he can achieve the goals and requirements of his profession . (Al-Zahrani, 2012)

Mardas (2014) introduces it to a set of skills and performance that teachers possess in the field of e-learning and should be practiced - educational attitude, based on the use of computers, and the Internet to communicate educational content through communication between the teacher and the learner, and between the teacher and educational content in an interactive way that enables him to learn (Mardas, 2014, 29). Amira and Izz al-Arab (2014) also defined it as the set of abilities that teachers must have from the skills and competencies they practice during the educational process, and linked to the employment of technological innovations in the educational process. (Amira and Izz al-Arab, 2014, 250) Shaheen (2017) defines it as the body of knowledge, experience and skills that the teacher possesses using the teaching computer and the processes of preparing, developing and storing teaching strategies.

Classification of e-learning competencies

Classify (Shank & Gannif 2003) into five areas

- 1- Technical competencies and included dealing with the techniques of employing them

- 2- Administrative competencies and included managing the educational situation
- 3- Design competencies and included the ability to plan activities related to content

Facilitation competencies that include what speeds up the process of interaction with learners Salem Classification (2004)

- 1- Knowledge competencies for the field of education technology
- 2- Single Education Competencies
- 3- Efficiencies of using educational devices
- 4- Performance competencies linked to the international network

Classification of the United Nations Educational , Scientific and Cultural Organization.

- 1- Pedagogy Addressing pedagogical experiences that cannot be ignored and linking them to modern learning theories
- 2- Team work and networking The role of the teacher here extends to facilitating cooperation, teamwork and the establishment of networks to communicate with local and global communities.
- 3- Health and social problems and discuss the need for teachers to understand the health and social problems resulting from the use of information and communications technology and not to be impressed with the technology and apply this understanding in their methods ofwork
- 4- Technical problems and discuss problems related to the integration of ICT and technical competencies that the teacher must be familiar with to solve that problem.(Mr. 2006.)

Zinedine Classification (2007)

- 1- Competencies related to computer culture
- 2- Competencies related to computer skills
- 3- Competencies related to information culture
- 4- Efficiencies in dealing with network programs and services
- 5- Competencies of preparing courses electronically.

Al-Attiyah Classification (2014)

- 1- General competencies that included (knowledge of the hardware components - software for the computer)
- 2- Competencies in dealing with Internet programs and services
- 3- Competencies of preparing electronic courses

Classified by Al-Otaibi (2017)

- 1- Competencies of using the Internet
- 2- Digital Knowledge Production Competencies
- 3- Communication competencies e-participation
- 4- E-learning management competencies.

Customer Classification (2018).

- 1- Completely electronic competencies related to computer culture
- 2- Competencies related to the information culture of knowledge of information methods and sources
- 3- Computer skills competencies
- 4- Competencies in dealing with Internet programs.
- 5- Competencies of using information sources and databases and designing electronic courses.
- 6- Discussion competencies and evaluation competencies, including following up tasks and solving problems

Based on the presentation of the previous classifications, the researcher reached a classification that is comprehensive of the most important common competencies that it is necessary for physics teachers to have: -

- 1- General electronic competencies: - Included the ability to identify physical computer parts and keep pace with the development and new versions of the computer
- 2- Competencies of dealing with computer programs : - Knowledge of the use of all computer programs as well as software facilitating the educational process
- 3- Competencies of dealing with the network: - It includes the creation of websites, searching, sending and receiving e-mail and how to access search engines
- 4- Competencies of designing the electronic interactive course: - Includes how to plan, design, develop and evaluate the electronic courses
- 5- e-learning management competencies: - It includes both the implementation of e-learning on the network and the use of the appropriate environment for the learning process and how to design tests and provide feedback

Previous studies dealing with e-learning competencies

SEQ.	Name of researcher and year of study	The purpose of the study	Study place	Standard	SAMPLE	Tools	Statistical means	Findings/results
1	Vanfossen (2000)	It aims to identify the level of educational technological competencies possessed by secondary school teachers, especially in the field of the Internet and the	The State of Indiana USA	Secondary education	191 teachers	Questionnaire	Pearson correlation coefficient and standard deviation	- A few teachers had high efficiency in using the Internet, knowing that 80% of them wanted to use it - There is a severe lack of teacher training in the use of the Internet and in exploring the dialogue between students and teachers in the use of

		dialogue that takes place between students and teachers in the use of information and communication technology						information and communications technology One of the most prominent results is that the use of information and communication technology in education has had a positive impact on the role of the teacher, so his role has become a facilitator for the learner, a guide for him, an organizer of the classroom educational environment and an encouragement to dialogue and classroom discussions. The role of the student has also become a search for knowledge and more self-reliant, an interlocutor and a discussant within the classroom
2	Al-Masudi (2021)	Detecting the extent to which the science teacher in the preparatory stage possesses e-learning competencies	Iraq	Medium	240 teachers	Survey	Pearson correlation coefficient Alpha coefficient Cronbach test for one sample T-test for two independent samples T-test for one variance analysis T-test coefficient correlation	- The degree of possession of science teachers in the intermediate stage of the adequacy of e-learning was weak among teachers - Those who have less than ten years of service seem to have more e-learning competencies than teachers who have more than ten years of service - Teachers of science in the intermediate stage have more competencies e-learning than teachers in the same stage - There are no

							n	statistically significant differences in the possession of the science teacher in the intermediate stage of e-learning competencies according to the specialization variable - The degree of attitudes of science teachers in the intermediate stage towards e-learning was clear. This is a comparison between the hypothetical average of 51 degrees - There is a simple, positive and direct correlation between the e-learning competencies of the school of science in the intermediate stage and their attitudes towards education
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Research Methodology and Procedures

First: research methodology: the researcher used the descriptive approach method in her research

Research community

The research community is defined as all individuals who carry data of the phenomenon that is within the reach of the study. It can also be said that the research community is the sum of the research units that are meant to obtain (Hanna Aziz and Hussein Anwar , 1990, 66) The researcher's determination of the research community is one of the most important steps of the educational research methodology, as it depends on the step of determining the community, conducting the research, choosing the appropriate tools and the accuracy of the results, and the current research of the physics teachers of the preparatory stage of the Directorate of Babylon Governorate, whos total number are (858) male and female teachers and throughout the governorate by (414) male teacher and (444) female teacher.

Research Sample

The sample is part of the community , and it has the characteristics of the members of the community withdrawn from it, chosen by the researcher in different ways and includes a number of members of the original community (Obaidat et al, 1984, 110)

Study sample:The study sample

- ♦ A sample of (300) physics male teachers for the preparatory stage was determined by (150) female teachers for the final application.
- ♦ the researcher adopted a sample of her research based on the Simple random sampling method.

Sample statistical analysis: statistical analysis sample

The procedures of the statistical analysis of the research tools were selected from the teachers of the physics subject number (100) for the statistical analysis of the e-learning competencies scale

Adjustment Procedures

Select The Sample

The main purpose of the sample selection is to obtain information about the original community of the study through which the results can be generalized (Abdul Hafeez and Mustafa, 2000, 129) and the researcher was able to control the individual differences between individuals by conducting the Simple random sampling method.

Measuring Tool

The researcher created a new classification of e-learning competencies that includes five types of competencies. On the basis of this classification, the researcher built an e-learning competency scale

E-Learning Competency scale

Selecting a Goal of the Scale

The measure aimed to measure the e-learning competencies of physics teachers for the preparatory stage (research sample).

See The Scale ofE-Learning Competency

The researcher reviewed the previous studies related to e-learning competencies, so he found that these studies are within the scope of the e-learning competencies , these studies include but not limited to (Al-Masoudi , 20 21), (Jiyad, 2013), (Al-Omari, 2009)

Define the concept of e-learning competencies

Select the Concept of E-Learning Competency

After reviewing the previous studies that dealt with e-learning competencies, it was found that there are many definitions of this concept, due to the multiplicity of theoretical frameworks from which it was launched, so the researcher relied on the theoretical definition of (Shaheen, 2017) to suit the objectives of the research and defined it as (It is the set of knowledge, experiences and skills that the teacher possesses using the computer in teaching and the processes of preparing, developing and implementing teaching strategies that can be practiced with an acceptable level of efficiency performance) (Shaheen, 2017, p. 615)

Select The Scale Areas

After reviewing the literature and the previous studies related to the research topic, we didn't find a measure of e-learning competencies commensurate with the current research objectives and samples, so the researcher built a measure of e-learning competencies for preparatory stage physics teachers, based on the classification that the researcher has prepared and includes the following competencies (general electronic competencies dealing with computer programs, competencies dealing with the Internet, competencies of designing the electronic interactive course, competencies of managing e-learning)

Formulation of the items of the scale in its initial form

Formation Of The items Of The Scale In Its Primary Form

The researcher drafted (60) items, including (7) cash items, which is paragraph (21, 22, 32, 34, 44, 47, 55) for the purpose of ensuring the objectivity of physics teachers in answering the items of the scale, and the items were distributed equally in terms of the number of e-learning competencies that were identified, and thus the researcher has achievedT Representing the items of the scale for e-learning competencies

Construct validity (statistical analysis): is the most complex type of validity that is not only concerned with the method of measurement, but also with the theory presented in its light and the interpretation of the results obtained from its use (Hanna Aziz, Hussein Anwar, 1990, 121) In order to achieve the procedures of analysis and extract the psychometric properties of the research tools, the researcher applied the scale to a random sample of the original research community, which reached (100) teachers of the subject: of physics in the preparatory stage

Scale Reliability

The Reliability of the scale indicates a high degree of consistency, accuracy and proficiency that are characteristic of the measurement tools through what the data on the behavior of the examiners show us (Shabbi, 2005, 113) For the purpose of ensuring the Reliability of the scale, the researcher used the

Vacronbach equation, as the idea of this equation, one of the advantages of which is consistency and reliability of its results, according to the correlations between the scales of all items of the scale. The coefficient of Reliability of the scale indicates the homogeneity between the items of the scale. (Allam, 2000 : p. 165) The Reliability coefficient of the scale was (0.96), and the scale whose Reliability coefficient is (0.60) or more is good.

The final version of the e-learning competencies scale: The measure in its final form consisted of (60) items . The researcher prepared a set of instructions that define the method of correction of the items , and instead it is the highest degree of e-learning competencies and the lowest degree ranging from (5-1) per paragraph. The highest score obtained by the test takers (265) and the lowest score is (53) and a hypothetical average (150). Instructions were also prepared to answer the scale clearly for the target sample, which is the teachers of physics at the secondary level. Therefore, the scale is ready to be applied

Presentation and interpretation of results

E-learning competencies among preparatory stage physics teachers

To achieve this goal, the researcher applied the e-learning competency scale consisting of (60) items on the research sample consisting of (300) teachers by (150) male teachers and (150) female teachers . After using the T-test equation for one sample to know the significance of the differences between the arithmetic average and the hypothetical average, it appeared that the calculated T-value is (3,71) greater than the tabular T-value of (1.65) at the level of significance (0.05) and degree of freedom (298). There is a statistically significant difference between the mean of the sample and the hypothetical average on the e-learning competency scale . This indicates that the sample has a high level of e-learning competencies as shown in Table (1)

Table (1) E-learning competencies among preparatory stage physics teachers

Sig 0.05	T value		Hypothetical mean	STD	Arithmetic mean	SAMPL E	Variable
	tabular	Calculated					
statistically significant	1,65	3,71	159	58,70	171,56	300	E-learning competency scale

The researcher explains this by : when physics teachers took courses to practice e-learning because of the Corona pandemic to raise the level of their ability to e-learning competencies, as well as at the university level (teacher preparation stage), teachers study electronic programs and how to design and implement them in colleges that have smart classes. The Al Shaheen considered competencies as the set of knowledge, experience and skills that the teacher possesses using the computer Teaching and the processes of preparing, developing and implementing teaching strategies

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