E-learning applications and their significance among students of the Department of Chemistry in the Faculty of Education for Pure Sciences – Ibn Al-Haytham

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Abstract---The objective of the current research is to identify: 1) Preparing a scale level for e-learning applications, 2) What is the relationship between the applications of e-learning and the students of the Department of Chemistry at the Faculty of Education for Pure Sciences/ Ibn Al-Haytham – University of Baghdad. To achieve the research objectives, the researcher used the descriptive approach because of its suitability to the nature of the study objectives. The researcher built a scale for e-learning applications that consists of (40) items on the five-point Likrat scale (I agree, strongly agree, neutral, disagree, strongly disagree). He also adopted the scale of scientific values, and it consists of (40) items on a five-point scale as well. The sample consisted of (200) male and female students from the Department of Chemistry at the Faculty of Education for Pure Sciences/ Ibn Al-Haytham - Phase Four – Morning Study. The psychometric properties of the instruments were verified from face and structure validity and Reliability in a manner of internal consistency, and the researcher used the following statistical means: (T-test of one sample, T-test of two independent samples, Chi-squared test, Pearson correlation coefficient, equation of Cronbach's alpha). The researcher reached the following results: 1) The large number of students of the Department of Chemistry at the Faculty of Education for Pure Sciences/ Ibn Al-Haytham who are using e-learning applications, 2) There is a strong correlation and direct relationship between the applications of e-learning and the students of the Chemistry Department. The significance of e-learning applications, their relationship and their significant and effective role in the development of these important applications has been discussed in this research among the students of the Department of Chemistry at the Faculty of Education for Pure Sciences – Ibn Al-Haytham /

University of Baghdad. E-learning applications have included multiple applications such as computer, the Internet, e-mail and other applications and constitute for students important and effective roles in his scientific career.

First: - Research problem

In view of the great changes that the world is witnessing today with the entry of the information age, the communications revolution and the recent developments in science, knowledge and technology have had an impact on various aspects of life, in addition to the exposure of the world's population to the spread of a new deadly epidemic (Covid 19) that disrupted life in all its joints and fields and imposed the domestic epidemiological quarantine on everyone, except for some sensitive and important areas that are necessary for life (security, food and health).Thus, the most important joints of building and preparing individuals for life and its main corner, which is the joint of education, were disrupted, and in order not to disrupt that field in general and in the upper stages at least, those responsible for education and education resorted to the applications of e-learning in providing multiple services and imposed on educational and academic organizations to respond and change and adapt to those developments, and provide new educational models. Higher and university education is an advanced stage in the educational ladder in society, and its students represent a dominant layer in the community system, and governments are doing everything in order to provide the reasons for obtaining higher and university education properly, and enable them to face the challenges of the age. There are important and varied applications through which students' ability can be developed, learning and education can be advanced, acquiring knowledge and knowledge, and keeping pace with the development of the world in all branches and directions. This can be obtained and worked on, but not resolved from existing difficulties, which can be avoided in the near future and with the progress of science little by little.

Second : research significance

The importance of research in the great changes that the world is witnessing today with the entry of the information age, the communications revolution and recent developments in science, knowledge and technology has had an impact on various aspects of life, including education. In recent years, the world has witnessed successive and rapid technical and information developments, and openness to different cultures, which have had a great impact on the educational process. Educational institutions have suddenly found themselves forced to switch to distance education to ensure the continuity of the teaching and learning process, which made it necessary for educational institutions to live with all global changes, to keep pace with those changes and developments. and challenges, and in light of global trends and educational development policies that have taken many forms from all branches of knowledge, and benefiting from technical developments in the field of education and achieving the goals of

modern education and integrating communication and information technology in the educational process, to show from all this the use of e-learning applications, which is one of the most important modern terms that are considered one of the most important foundations for the development of the educational and learning process, and helps the learner to learn in the appropriate place and time through interactive content based on multimedia, that e-learning applications are an educational system based on modern technology in the world of communication and information in teaching students the educational process through the use of e-learning, the Internet, computer and electronic programs prepared by specialists in the field of education, and I have witnessed The last years have been a major breakthrough in technical innovations related to education, from computer-based education to the use of the Internet in the educational process to e-learning, which is e-learning, and e-learning, which is an element of e-learning applications that represent an important element, and it is a method of teaching through the delivery of theoretical materials to students using modern means of communication, especially the Internet, and depends on the use of technology and technical means in education and harnessing them for the student's self- and social learning and making it a method of teaching using modern communication mechanisms such as computer, networks and multiple means of image, voice and graphics, in addition to providing educational and training programs for teachers and learners and developing their skills and information. E-learning applications are one of the methods of education that depend on the provision of educational content and the delivery of skills, concepts and scientific values of the learner on information and communication technologies and their multiple means in a way that allows students to interact actively with content, teacher and colleagues in a synchronized manner. They are also one of the electronic means to make knowledge available to those who publish outside the classrooms. Scientific studies and research have demonstrated the effectiveness of these technical innovations in education and training, as technical training using technical learning environments has become an area for continuous professional development, providing a great deal of interaction and activity during training. Technical educational environments are one of the rich technical educational applications of the Internet. They are alternative environments to the traditional physical environment, using the potential of information and communication technology to design, develop, manage and evaluate different learning processes. Thursday, 2015: 79) E-learning applications have been characterized by a range of characteristics, including suitability, flexibility, equivalence, diversity, ease of access to the learner, taking into account individual differences, multiple evaluation methods, interactivity, and student centricity and modernization. The most important technical achievement achieved is the Internet, where man was able to cancel distances and shorten time and make the world a small electronic screen in the era of mixing technology, media, information and culture, and became the electronic communication and exchange of news and information between computer networks and the speed of access to science and knowledge centers and libraries and to see everything new moment by moment .Science is a knowledge structure that man has reached over time and I use it to describe the natural and human phenomena that occur around him and to realize the relationships between them, to understand them and increase his control over him. Therefore, science has become an urgent need and urgency for human societies that seek to rise up and face their needs and aspirations and keep pace

with advanced nations. (Taylor, Swan, 1990: 59) One of the most prominent characteristics of science in this century is the integration of science and technology into one system that imposes on the learner a greater awareness of the value of science and the importance of its applications to meet his need to develop knowledge foundations according to value frameworks on scientific applications and the employment of technology. (Khazali, 2009: 115) Therefore, science has become an urgent necessity for human societies that aspire to lead the world to meet their needs and meet their aspirations(Noah,2010: 17), which made educational institutions of all stages and training institutions on the diversity of their programs witness a wide acceptance for the armament of science, which generated a fierce competition between societies to lead and control scientific knowledge as a form of power (Samia Bagago, 1996 : 78) . The transfer of science to individuals and communities requires the use of various technical means within the cultural context of societies in order to be acceptable and beneficial, in the sense that there are a set of ethical levels for men of science that are responsible for controlling and directing their scientific and technical activities in various affairs and areas of life and disciplines. These levels are called scientific values to derive the concept of scientific values through the interrelationship between science and values. There are multiple and different roles for the teacher and the learner in e-learning. The teacher contributes to supervising the e-learning process, interacts with the learners, directs their learning and evaluation of their performance, has the ability to teach, and uses modern teaching techniques and his knowledge of computers, the Internet, e-mail and other multimedia. The teacher takes into account the processes of evaluating his students through computer programs, and provides them with feedback on their level and methods of development . The teacher instills the scientific values of his students through scientific thinking, scientific validity, and respect for others, through the ethics of using technology and teaches it to his students through respecting the intellectual property rights of programs and sites, dealing with reliable sites and programs, and choosing useful information related to the curriculum when dealing with technology, especially the Internet and e-mail . As for the role of the learner in e-learning, it is also diverse and multiple, such as :

1. Knowledge of the use of the computer, the Internet and e-mail, and the ability to work with them to be able to interact with the electronic curriculum, and communicate with his professors and colleagues.
2. Use of service programs related to e-learning applications such as chat programs and file transfer programs.
3. The ability to obtain information from e-learning media such as libraries, portals and websites .
4. Interaction with content means the learner's interaction with the information provided for the purpose of acquiring knowledge .
5. Be serious and committed .
6. The existence of full conviction in the benefit of e-learning applications, its means, types and wide fields, all of this enhances the scientific values of the learner, instills and develops them, encourages interaction with these applications to think and approximates the views of students, and provides opportunities for continuous communication between the student and the curriculum all the time .
7. The importance of e-learning and a course in education based on the principle of the integration of experiences is highlighted for students inside

or outside the school system with the activation of relations electronically between the school, the university, the home and the community. This can only be achieved by maintaining channels of communication between teachers, students and their parents to achieve what contributes to their growth and academic progress. (Navigator,2010 – A, 64) . The use of various e-learning applications has witnessed rapid and remarkable development, and with the development of means of communication has become one of the main pillars in human life, and reliance on education applications has become great in many developed countries characterized by technical development and acceptance of the culture of flexible education, due to the trend of many international websites specialized in giving some courses through interactive education. Including the provision of examinations for these courses or curricula and obtaining official accredited certificates of qualitative importance, and the emergence of these various applications has led to a real educational revolution through knowledge exchange that has overcome many barriers, and the exchange of knowledge and experiences in various fields. Through all of the above, the applications of e-learning seek to achieve the educational goals that e-learning seeks to apply and achieve and help to support, interact, organize, encourage and exchange educational experiences and purposeful opinions, and also achieve the demands of e-learning through the provision of (local computer networks. Classroom management systems. Digital e-book. Interactive e-learning board. Computers for teachers, students, classrooms and laboratories . auxiliary software for learning resources). This research may contribute to the importance of adopting e-learning applications to make the education system integrated and interactive with the beneficiaries and through the use of the computer mainly and the Internet and other important means such as the e-curriculum, the e-library and electronic programs. It is a system that is the result of the information revolution, which foreign and Arab universities have begun to adopt its applications to achieve many goals, the most important of which is to serve the members of society, and thus the technology of e-learning and its applications have become an integral part of the life of educational communities.

Fifth : - research terminology

Definitions of e-learning applications: Defined by: -

a. (Zeitoun, 2005) "is the provision of educational (electronic) content through computer-based media and its networks to the learner in a way that allows him to interact actively with this content and with all other educational elements such as the teacher and his peers, whether simultaneously or asynchronously" (Zeitoun, 2005: 98).

Procedural definition: "It is the set of means and methods used by (students of the Department of Chemistry - Faculty of Education for Pure Sciences – Ibn Al-Haytham) more freely to acquire information and under the supervision of a more precise guide by the professor, in order to achieve the educational goals and their evaluation."

Chapter Two: - A theoretical framework and previous studies

E-learning applications: Entering the era of knowledge, which is based on the exploitation of modern technologies in various aspects of contemporary life, requires the advancement of the future vision. Educational technologies are concerned with designing educational attitudes and learning environments with all their components, developing and managing them in order to achieve the specified goals with the highest efficiency and with the least time and effort . One of the applications of e-learning is the techniques of e-learning, which are defined as: The organized cognitive construction of theories, research and practices of learning and education processes, and the sources of learning and their application in the field of human learning and the efficient employment of human or non-human elements, to analyze the system and the educational process and study its problems, and the design of appropriate processes and resources as practical solutions to these problems and their development (Al-Muhaisin,2002: 4) The development and progress in the field of educational technologies has led to the emergence of many innovations and technical applications whose employment has become an urgent necessity in the educational process to benefit from them in raising the efficiency of the educational process and among these innovations is e-learning, which indicated that the process of learning and receiving information is done through the use of devices and innovations of multimedia technology in isolation from both sides of space and time, where communication between teachers and learners is made through multiple means of communication and communication technologies play a major role in it.Al-Muhaisen, 2002 : 4). The appropriate use of ICT in e-learning makes education a more effective and efficient social activity, and educational institutions, when adopting an e-learning system, are able to create e-learning environments that in turn improve their strengths and reduce weaknesses at the same time. His definition (Al-Awaid,2003) is education that aims to create an interactive environment rich in applications based on computer and Internet technology and enables the student to access learning resources at any time and from anywhere. (Al-Awaid,2003 : 98).

It is "an innovative way to communicate accessible learning environments, characterized by good design, interactivity and learner-centeredness, to any individual at any time by taking advantage of the diverse characteristics and sources in many digital technologies together with other types of educational materials suitable for open and flexible learning environments." (Al-Khazaala, 2015: 37). Arafa Salem (2014) "It is an educational system to provide training or educational programs for learners or trainees at any time and anywhere using interactive information and communication technologies such as: (Internet, radio, local and satellite channels for television, telephone, e-mail, computers) to provide an interactive, multi-source learning environment in a remote manner without committing to a specific place based on self-learning and interaction between the learner and the teacher." Salem, 2014 : 289).

One of the most important applications of e-learning as mentioned by (Tariq Abdel Raouf in his book E-Learning and Virtual Education, 2014: 165) are (Computerized Education, Internet Education, Interactive Video, Electronic Course, Interactive Education).

A - Objectives of e-learning applications: -
- Provide educational strategies to suit all age groups.
- Taking into account the individual differences of students among them .
- Supporting the process of interaction between students and teachers through the exchange of educational experiences, opinions, discussions and dialogues aimed at exchanging opinions using various communication channels such as e-mail, conversation and virtual classes.
- Modeling education and presenting it in a standardized form.
- Creating educational networks to organize and manage the work of educational institutions.
- Strengthening the relationship between students' parents and the school. (Tarek Abdel Raouf, 2014: 168)

B - Types of e-learning applications:

Simultaneous e-learning: - It is live or live education, which requires the presence of learners at the same time in front of computers, to conduct discussion and conversation between the learners themselves, and between them and the teacher, and this discussion is done by means of e-learning tools such as(whiteboard – virtual classes - conferences via(video and audio, chat rooms – satellite programs). One of the pros of this type of education (getting the learner immediate feedback, reducing the cost, dispensing with going to the study headquarters). The cons are (needs modern devices and a good communication network, adhering to and adhering to the time specified for lessons, the presence of the teacher and the learner at the same time, conducting research outside the learning area because the learner is distracted from the study) .

Asynchronous e-learning: - It is an indirect education that does not require the presence of learners at the same time as the learner is able to obtain a study according to the times suitable for him and the effort he wishes to provide, and tools such as (e-mail, web, mailing lists, file transfer, CD-ROM, interactive video and textile network) are used. One of the advantages of this type of education (the learner's access to study according to the appropriate times for him, receiving education according to the effort that the learner wishes to provide, being able to re-examine the subject and refer to it electronically as needed) and its disadvantages (the learner's lack of immediate feedback from the teacher, leads to introversion in education because he isolates it from society and friends in terms of education, leads to depriving the learner of asking the teacher about a point within the educational process), which makes him restricted by his information.

Mixed education: - The synchronous is used once and the asynchronous again, according to the activities proposed by the teacher, it gives the learner more freedom and achieves a kind of social in education .

C – **Employing e-learning applications in the educational process: Educational**
applications and techniques provide many roles, benefits and advantages for the teaching and learning processes:
- Provide time for the teacher when explaining the scientific material.

- Contributes to the communication and communication of facts and information to students that are difficult to understand using traditional methods
- It provides students with a variety of experiences that provide opportunities to watch, listen, reflect and think.
- Helps students discover and innovate by dealing with teaching aids .
- It develops the spirit of joint work between teachers and students by participating in the design and production of teaching aids.
- It leads to a variety of reinforcement methods that prove the right answers and emphasize learning, such as watching an educational film to answer questions or solutions to educational problems and situations.
- It helps to stabilize, remember, and recall information when needed because it stays in the student's mind with a clear picture.
- It helps the teacher in the process of adjusting the class as he faces most of the time towards the students.
- Helps overcome the problem of individual differences between learners.

D – teacher role in e-learning applications:

The teacher as an educational mediator. Teacher as a pedagogical mentor. Teacher as leader and driver of classroom discussions.
As for a course in the computer and the Internet : . Education design. Recruitment of technology   . Encouraging student interaction
. Developing students' self-learning. (Abdulraouf, 2014 : 67).

E- learner role in the applications of e-learning: -
- The learner learns through practice and self-research .
- Learns in a group and interacts with others .
- Learner has access to education and knowledge without spatial or temporal barriers and for life
Learn in a way that is independent of others and according to their circumstances
. (Hamdi Abdulaziz,2011)

Indicators on previous studies related to e-learning applications: -

Most of the previous studies that dealt with e-learning applications were dealt with from different and varied angles, with some similar aspects and some different aspects in these studies, including: -
1- Academic stages: - The studies mentioned in the subject of e-learning applications for multiple and different educational stages, which can be limited to second and university education.
2- Research   sample: -
Th
ese studies mentioned a difference in the number of samples targeted in the research, including the category of students, the sample of teachers, teachers, and educational supervisors.
3- Statistical methods: - Despite the diversity and diversity of studies that specialized in e-learning applications, their means and statistical tools were fairly close, as most of them were the arithmetic average, a square like any, percentages, and the T-test of one sample and two samples.

4- The research tool: - The majority of previous studies adopted the questionnaire as a tool for their research, except for the study of Al-Musa, which adopted an analysis of results .

5- research tool validaty - The most prominent methods of researchers in obtaining validity for the study tool based on the face validity method, by presenting the measurement tool to a number of arbitrators in order to make observations and obtain approval about it.

6- The reliability of the research tool: - The reliability of the tool was verified by extracting the alpha-cronbachcoefficient.

Chapter Three : - Research Methodology and Procedures

This chapter includes a description of the research procedures in terms of its methodology, society, sample and method of selection, as well as the tool used, the steps of its construction, the procedures for its application, and the statistical methods used in processing data and analyzing results .

Research Methodology

The descriptive correlational approach was chosen as the most appropriate method to study the relationship between the variables that are interested in describing the demands of the use of e-learning applications and their relationship to scientific values among students of the Faculty of Education for Pure Sciences – Ibn Al-Haytham at the University of Baghdad, as the descriptive approach is considered one of the scientific research methods that is interested in describing the phenomenon or event that is the focus of the researcher's attention as an accurate scientific description. (Al-Jabri & Abu Al-Helu, 2009 : 197).Here, all persons or individuals who are part of the subject of the problem that the researcher seeks to circulate his results to him. (Obaidat et al., 2003: 11).

Research procedures: First: - Research community

The research community includes students of the Faculty of Education for Pure Sciences – Ibn Al-Haytham / Department of Chemistry – University of Baghdad - Phase Four - Morning Study divided into four study divisions (A, B, C, and D). A task facilitation book was obtained as an annex (1).

Second: - The research sample
The research sample included students of the Department of Chemistry at the Faculty of Education for Pure Sciences – Ibn Al-Haytham at the University of Baghdad for the academic year (2021-2022), where students of the fourth stage – morning study were selected, where the research tool was distributed to (200) students.

Third: - Research tools: 1– The scale of e-learning applications

The researcher used the scale of e-learning applications to collect and prepare research data. The researcher built a scale of e-learning applications that the researcher defined as "the set of means and methods used by students of the Department of Chemistry / Faculty of Education for Pure Sciences/ Ibn Al-

Haytham more freely to acquire information and under more precise supervision by the professor, in order to achieve the educational goals and evaluate them." Through the previous literature and studies and through the procedural definition, the researcher identified six areas around which the necessary demands for e-learning applications revolve. These areas are (means and methods used in e-learning, the role of the teacher in e-learning, the role of the learner in e-learning, the presentation of educational content, the achievement of educational goals, and the evaluation of educational goals).The researcher presented the measure to a group of experts and arbitrators specialized in curricula, teaching methods and educational psychology. The total number of items for e-learning applications reached (40) items, and the construction of the scale took into account their suitability for the sample in terms of language formulation and clarity of what the items ask, and these areas were defined as follows: -

The first area: The means and methods used in e-learning applications: - It is the use of all applications and electronic networks such as computer applications and the Internet in the process of teaching and learning, and multimedia in order to deliver information to learners as quickly as possible and less costly in a way that can manage and control the learning process and measure and evaluate the performance of learners.
The second area: The role of the teacher in the applications of e-learning: - He is the teacher who supervises the e-learning process, interacts with the learners, guides their learning and performs their performance.
The third area: The role of the learner in the applications of e-learning: - A student who learns through the method of teaching and e-learning by receiving or studying all means and applications and acquiring knowledge.

The fourth area: Presentation of educational content: - It is the presentation, design, implementation, evaluation and evaluation of educational content in e-learning and the implementation of all e-learning requirements and investing them positively and effectively.
Fifth area: Achieving educational goals: - These are the goals that e-learning seeks to implement and achieve and help to support, interact, organize and encourage communication between students and teachers through the exchange of educational experiences, opinions and meaningful discussions.
The sixth area: Evaluation of educational goals: - It is the most important means through which to ensure the achievement of goals and identify the strengths and weaknesses in the educational process. The following pentagram system was used (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree). Adopt the scores (5, 4, 3, 2, 1) for the items in the scale from right to left.

A - Validity scale : (face validity)

Both (Al-Duhayan and Hassan, 2002) believe that validity must measure the characteristic or phenomenon under study, and does not measure others or another phenomenon with it. (Al-Duhayan and Hassan, 2002 : 197). The validity of the tool was verified by presenting it to a group of arbitrators specialized in curricula, teaching methods and educational psychology, Appendix (2). Their opinion on the tool was taken to ensure its validity in measuring what it was

prepared to measure, and in Appendix (9) the tool in its initial form, and the number of items of the scale was (40) items, and it was modified according to the opinions of the arbitrators, as the scale of e-learning applications included six areas.

B – The exploratory sample

The scale of e-learning applications was applied to the exploratory sample of (40) male and female students from the research community and the scale was applied to them on Tuesday,14/12/2021.For the purpose of calculating the time required to answer, as the general average of the time taken to answer the first (3) students, and another time (3) students from that sample, it was found that the time required to answer the items of the scale ranged between (15 – 25) minutes with an average capacity of (20) minutes, and it was found that the items are clear and smooth to individualize the sample,

C – Answer instructions

Complementing the initial formula of the two scales, the researcher prepared the instructions for answering the two scales, taking into account the clarity and accuracy and indicating that the information obtained is for the purpose of scientific research only. It thus included the selection of only one of the five alternatives allocated to each item, by placing a (/) check mark in the appropriate place in front of the appropriate alternative.

d - construct validity (internal consistency of the test)

In order to obtain a measure of e-learning applications characterized by validity and for the purpose of homogeneity of items in their measurement of the phenomenon, internal consistency is the one that achieves the validity of the building by applying it to the sample of statistical analysis of (40) male and female students from the Department of Chemistry at the Faculty of Education for Pure Sciences - Ibn Al-Haytham, and the researcher calculated the vertebrae validity through :

The relationship of the item to the total score of the test

The relationship of the degree of the item to the total score of the scale means that the item measures the same concept as the total score, (Lindquist, 1976: 286). Using the Pearson correlation coefficient for each item with the total of the test, this indicates the internal consistency of the test items, as the values of the correlation coefficient ranged between (0.39-0.91) at a degree of freedom (38). It was found that all the items are indicative at a level of significance (0.05) and the tabular value was (0.30). In light of this, the items whose correlation coefficients with the total degree of scale are significant were retained.

The relationship of the degree of item to the total score of the field

When calculating correlation coefficients between the degree of each item and the total degree of the field to which it belongs and using the Pearson correlation

coefficient, it was found that the results of the statistical values of the correlation coefficients ranged between (0.40-0.92)at a degree of freedom (38), which are good correlation coefficients,

Relationship of the field to the total score:

The correlation coefficient between the values obtained by students on each field of the e-learning applications scale was calculated, and the use of the Pearson correlation coefficient (between the field score and the total score of the scale) found that the results of the statistical values of the correlation coefficients ranged between (0.88 – 0.96), which are excellent values

The distinctive strength of the items: - The strength of the distinctiveness of the items indicates the ability of the item to distinguish between strong and weak individuals in the phenomenon (Al-Najjar, 2010: 254) The sample was divided into high and low halves because the number of the sample is small, and the distinctive strength of each item of the e-learning applications was calculated using the test that used two extremist samples, so the value ranged between (3,002 – 12,951) Table (6), which is greater than the tabular value (2,045) at the level of significance (0.05), so all the items are valid for their ability to distinguish between students.

B- Reliability: - (Al-Duhayan and Hassan, 2002) believes that Reliability means"the Reliability of the data collection tool and not contradicting it with itself", which means that the data collection tool is stable measurements if it is applied more than once. (Al-Duhaian and Hassan,2002: 197).

 Statistical means : - 1- Chi-squared test 2- Alpha-Cronbach equation 3- Percentage 4- Analysis of variance .

Chapter Four

First: - Presentation and Interpretation of Results:
This chapter includes a presentation of the most important findings of the researcher in the light of his statistical analyses and their interpretation according to the data and discussion of those findings in the literature phase, with the development of conclusions and recommendations, and the submission of some proposals for future studies to complete those findings

1-**The scale of e-learning applications: -** After applying the research tool of (40 items) to a sample of (200) male and female students of the Department of Chemistry - fourth stage in the Faculty of Education for Pure Sciences – Ibn Al-Haytham, the data was collected and analyzed statistically. The researcher found that the arithmetic mean of the scale of e-learning applications was (126.9), with a standard deviation of (26.85). The researcher extracted the hypothetical mean of the tool and reached (120). To know the significance of the differences between the arithmetic mean and the hypothetical mean, it was found that the difference is statistically significant at the level of (0.05), as the calculated value of (3,613), which is greater than the tabular value of (1,960) and with a degree of freedom of (198). Table (10) shows this .

The students of the Department of Chemistry practice e-learning applications widely and much, as the arithmetic average reached (126.9), which is higher than the hypothetical average of (120), and this comes as a result of the provision of many e-learning applications and their differences such as computer, e-mail, and the Internet .

First: - Conclusions: - In light of the research results presented by the researcher, he reached many of the following conclusions: -
1- The large number of students in the Department of Chemistry practice the applications of e-learning .
2- There is a strong correlation and direct relationship between e-learning applications and chemistry students.

Second: - Recommendations : Complementing the research requirements, the researcher recommended some recommendations, including: -
1- Enrol students in courses that develop their knowledge and skills in using the computer because this facilitates the application of e-learning.
2- Holding training courses and workshops for teachers on the use of e-learning applications to acquire knowledge and technical skills sufficient to employ it in the educational process.
3- Developing educational curricula to suit the mechanisms of modern scientific and technical progress, and benefiting from the experiences of others to conform to the determinants of Iraqi society.
4- Activating the applications of e-learning and disseminating it to institutes, colleges and centers within the university and benefiting from media information technologies.

Third: - Proposals: - In continuation of the current research, the researcher proposed some of the following proposals: -
1- Conducting research on (the extent to which electronic applications are activated in schools and educational departments).
2- Developing the objectives of e-learning applications and include broader areas.
3- Conducting development research for e-learning software in an effort to overcome the existing disadvantages.
4- Define the role of total quality standards and e-learning applications.

References

Al-Tayti, Khader Mesbah (2008): E-learning from a commercial, technical and administrative perspective, Hamed Publishing and Distribution House, Amman, Jordan.

Estate, Dalal Melhas and Sarhan (2007): E-Learning Technology, Dar Wael, Amman – Jordan.

Ismail (2003): E-learning from application to professionalism and quality, World of Books, Cairo.

Al-Turudi, Awad Hussein (2004): The e-School and Modern Roles for Teachers, Lebanon Library, Beirut.

Al-Halfawi, Walid Salem (2011): E-learning new applications, Dar al-Fikr al-Arabi, Cairo, Egypt.

Al-Khazaala, Fatima Ahmed (2015): Communication and Education Technology, Ghida for Printing and Publishing.

Dr. Ziad Al-Saqqa (2012): The role of e-learning in increasing the efficiency and effectiveness of accounting education, Amman, Jordan.

Al-Zuhairi, Talal Nazim (2009) : Strategy for the Application of E-Learning Programs in Iraqi Universities, First Scientific Conference of the Iraqi Information Technology Association, Baghdad.

Zeytoun, Hassan Hussein (2005): E-learning, Sound House of Education, Riyadh .

Salem (2014): Demands for the use of e-learning in teaching natural sciences.

Salem, Ahmed Mohammed (2004): Education Technology and E-Learning, Al-Rushd Library, Riyadh, Saudi Arabia.

Suryasa, I.W., Sudipa, I.N., Puspani, I.A.M., Netra, I.M. (2019). Translation procedure of happy emotion of english into indonesian in kṛṣṇa text. Journal of Language Teaching and Research, 10(4), 738–746

Samia Abdullah (2000): E-learning is an urgent necessity in the age of ICT, Issue(32), Faculty of Education, Damietta, Mansoura University.

Al-Shahrani, Nasser bin Abdullah (2009): The demands of using e-learning in teaching natural sciences in higher education, Faculty of Education, Umm Al-Qura University, Saudi Arabia.

Attiya, Reda Abdel Badi '(2007): A proposed vision for e-learning applications in Arab higher education institutions in the light of global trends, Riyadh, National House of Education.

AlAwaid, Mohammed bin Saleh (2003): E-learning at the Faculty of Communications and Information in Riyadh, King Faisal Schools, Riyadh, Saudi Arabia.