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DESIGNING WEB QUEST BASED ON E-LEARNING IN TEACHING COMPUTER FOR STUDENTS TO DEVELOP REFLECTIVE THINKING AND ACADEMIC ACHIEVEMENT DURING COVID – 19

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Abstract

This study aimed to design a Web Quest based on E-Learning during Covid-19 to activate types of distance education and online learning strategies in teaching educational content and providing teaching and learning opportunities in productive learning environments. That provide opportunities for cooperation, discovery, conclusion and the use of technical methods to perform educational tasks. Which increases the effectiveness of the process this was done by designing a Web Quest to teach the computer in developing reflective thinking and academic achievement among students of the second stage of basic education. The second experimental group ordinary method, the study relied on the quasi-experimental approach on a sample of (60) female students, and they were randomly assigned to two groups, the first experimental group (Web Quest), the second experimental group (the ordinary method). Honesty and persistence. The results showed that there were statistically significant differences at ($\alpha = 0.05$) between

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the average scores of the first and second experimental group students and the average scores of the control group students who studied using web Quest.

Keywords- Web Quest, E-learning, Reflective Thinking, Academic Achievement, Covid – 19.

1. INTRODUCTION

Recent years have witnessed developments in the field of information and communication technology, or the so-called Internet, in order to achieve the goals of education and obtain distinct educational outcomes, the most important of which is the integration of the Internet into the educational process, as the interest in the Internet has increased to serve the educational process around the world, but the beginning was limited to text only. And with the tremendous technological development, its presentation methods have changed to include audio broadcasts, educational videos, and participatory games (1).Strategies must be developed that enable the advancement of the student and make him the focus of the main educational process and direct him to obtain information via the Internet .In order to obtain it with the least possible time and effort in an active educational environment that increases his achievement, such as Web Quest to organize the process of navigation, research, investigation and development of the mental abilities of learners and rely on electronic resources on Internet sites. Web Quest is one of the methods of e-learning that combines careful educational planning on the one hand and the use of the Internet on the other (2).There is a need for meditation as a major part of the education process, as through meditation the student is expected to reflect on his learning and develop his skills and abilities, and the idea of developing reflective thinking has become one of the goals of education in general and scientific education in particular (3).

New programs must be used that contribute to the development of reflective thinking skills and academic achievement and provide a new educational environment that differs from the traditional school environment. A diverse environment in which education depends on exploration that stimulates students' thinking in the sense of giving the student an appropriate opportunity to clarify what has been learned and give a correct logical answer and develop trends Towards him (4).

2.RESEARCH PROBLEM AND QUESTIONS

The Corona pandemic imposed a new reality on education due to the preventive measures to confront it, which prompted the educational systems to confront the Corona delinquency and get rid of the negative effects of this delinquency on education and school learning. Integrating digital tools via the Internet and modern strategies in education, and because the teaching methods used do not suit the interests of students and depend on Memorization and remembrance, which is characterized by retrieval and identification

without paying attention to higher mental processes. And does not fit the era of technology, as we live in an era that has become the technology that has become the demand of societies at all times. This is in addition to what was proven by the results of many studies and research such as the study of Heba Ibrahim (5), Amira Hamdi (6), Vivian Aziz (7) from the lack of thinking skills in general and reflective thinking skills in particular among students of different academic levels. These studies and research recommended the need to develop these skills through the use of modern strategies such as Web Quest. And the current reality of teaching computers and information and communication technology still depends on traditional methods. Where the focus is on transmitting information rather than on generating it, and this has resulted in the role of the learner on listening only and the role of the teacher on indoctrination, and this means the absence of the student's role in the educational process and the limitation of His role is to recall in the tests only. Which all of this prevents him from practicing thinking skills in general and reflective thinking skills in particular (4).Because of the increasing demand of students on the Internet, I propose original methods of teaching that integrate technology into education, such as Web Quest as one of the good teaching strategies that combine educational planning on the one hand and the systematic use of the Internet .Its use in the educational process and its use in teaching as it increases academic achievement and assimilation of information and concepts and self-learning in research, inquiry, knowledge acquisition, development of thinking in general and reflective thinking in particular. In order to develop the outputs of the educational process in the future in the light of e-learning and distance education tools.

The problem of the research is determined in the shortcomings of the current teaching methods used in teaching computer subjects in "developing academic achievement and reflective thinking" among students of the second stage of basic education. To treat this problem, the research problem was determined in answering the following questions:

1- What is the effectiveness of the two chosen units in developing reflective thinking in computer subject for students of the second stage of basic education?

2-The effectiveness of using Web Quest in developing academic achievement in computer subject for students of the second stage of basic education (achievement test).

3.RESEARCH AIMS

The current research aims to employ the Internet in the field of computer discovery and inference and its impact on:

- The effectiveness of using Web Quest in developing reflective thinking in computer subject for students of the second stage of basic education (reflective thinking scale).

- The effectiveness of using Web Quest in developing the academic achievement of computer subject for students of the second stage of basic education (achievement test).

4.RESEARCH IMPORTANCE

The study represents a response to keeping pace with modern trends in teaching and the legal employment of the Internet. The research results may contribute to:

➢ Designing an educational website Web Quest using the (ADDIE) model using a model in the design of the lessons of my units for the units "Websites" and "Introduction to the Java language" of the computer subject for students of the second stage of basic education, the computer course, which benefits teachers in designing the Web Quest in other subjects.

➢ Providing a teaching guide for the teacher according to the Web Quest when teaching the computer.

➢ Providing a reflective thinking questionnaire to measure the levels of reflective thinking.

➢ Developing academic achievement in computer subject.

➢ Developing educational systems based on networks and keeping pace with modern trends in teaching and developing higher-order thinking skills through Web Quest.

5.SEARCH LIMITS

- This research is limited to students of the second stage of basic education at Dakahla Preparatory School for Girls - Zarqa Center - Damietta Governorate. Experimentation is limited to the year 2020/2021.

- Experimentation is limited to two web sites and an introduction to the Java language, which are two courses for students of the second stage of basic education in computer and information and communication technology using Web Quest.The Research consisted of (60) female students of the second cycle of basic education at Dakahla Preparatory School for Girls, an experimental group of (30)

female students, and a control group of (30) female students, and the research group was chosen randomly for the two experimental groups.

6.RESEARCH HYPOTHESES

1) There is no statistically significant difference at the level of significance ≤ (0.05) between the mean scores of the students of the control and experimental groups in the pre-application of the reflective thinking scale.

2) There is no statistically significant difference at the level of significance ≤ (0.05) between the mean scores of the students of the control and experimental groups in the pre-application of the academic achievement test.

3) There is a statistically significant difference at the level of significance ≤ (0.05) between the mean scores of the students of the control and experimental groups in the post application of the reflective thinking scale in favor of the experimental group due to students' learning using Web Quest.

4) There is a statistically significant difference at the level of significance ≤ (0.05) between the mean scores of the students of the control and experimental groups in the post application of the academic achievement test in favor of the experimental group due to the students' learning using Web Quest.

7.RESEARCH METHODOLOGY AND TOOLS

- Descriptive Analytical Method: It aims to collect, analyze and interpret data by presenting relevant literature and previous studies.

-Semi-Experimental Method: To study the effectiveness of Web Quest in developing academic achievement and reflective thinking by applying the pre and post study tools to the two research groups "experimental and control".

- Web Quest according to the ADDIE design model and an educational web design for the units "Websites" and "Introduction to the Java Language" in the computer course.

- Teacher's guide - Student's handbook and the reflective thinking scale.
- An achievement test for the content of the units Websites and Introduction to the Java Language.

8. RESEARCH TERMS

- E-Learning

A method of education using modern communication mechanisms such as computers, networks, multimedia, search mechanisms, and electronic libraries in delivering information to the student in the shortest time and least effort(8).

- WEB QUEST

Web Quest Actively employing the Internet in the classroom by students, and investigating through tasks and activities, encourages students to work and think, individually and collectively, taking advantage of the great and abundant resources and capabilities of the Internet (9).

It is defined procedurally as educational activities that are carried out using educational websites on the Internet according to studied steps to achieve pre-defined goals and in a way that encourages cooperative work, saves time and develops reflective thinking skills.

It is defined procedurally as educational activities that are carried out using educational websites on the Internet according to studied steps to achieve pre-defined goals and in a way that encourages cooperative work, saves time and develops reflective thinking skills.

- REFLECTIVE THINKING

An active and conscious mental process about an individual's beliefs and experiences so that he can reach results and solutions to problems he encounters (10).

It is procedurally defined as the thinking in which the student reflects on the situation in front of him, and analyzes it into its elements, with the aim of reaching the results required by the situation, and evaluating the results in the light of the plans laid down, and it is measured through the reflective thinking scale.

- ACADEMIC ACHIEVEMENT

Academic achievement is the result of what takes place within the educational institution of various learning processes of different skills, knowledge and sciences that indicate his cognitive mental activity (11).

It is procedurally defined as the amount of information acquired by the students of the second stage of basic education during their study of the two units Websites and Introduction to the Java Language from a computer course using the Web Quest strategy, and it is measured by the degree that students obtain in the achievement test.

- COVID -19

Covid -19 was defined by the World Health Organization as an infectious disease caused by the last virus that was discovered from the strains of Corona in the Chinese city of Wuhan, and it turned into a delinquent affecting many countries of the world (12).

9.THEORETICAL FRAME WORK

9.1 E-LEARNING

E-learning is one of the best ways to employ technical innovations, multimedia and the Internet to raise the quality of education. Provide students with modern learning skills based on knowledge and the search for information in line with the demands of learning .In the twenty-first century, centered on the student whose role changes from the recipient to an active participant in the process Education in an environment rich in information and communication sources (13).The role of the teacher is a facilitator of learning, a guide for students, and a guide for them in how to obtain knowledge, not the source of knowledge (14).

- TYPES OF E-LEARNING

- *E-learning is divided into two types (15).*

1- Synchronous E-Leading

The Internet is employed in providing educational content to the student, and through it the opportunity for active interaction with the content, the teacher, and colleagues is provided. This type of e-learning can be divided into:

- *Local Area Network - LAN*

It is the type in which the local network is employed in the process of education and content delivery.

- *World Area Network – WAN*

The global network is employed in the education and content delivery process.

One of the advantages of (direct and simultaneous e-learning) is that the student can obtain direct feedback from the teacher.

- *Asynchronous E-Leading*

In which the student receives lessons or educational courses according to a planned study program in which times and places are determined that suit the student's circumstances by employing some e-learning

methods such as (e-mail - video tapes - CDs) and computer software such as (simulation software - teaching software private) and Learning Management Systems (LMS).It depends on the time spent by the student to reach the skills that are intended for the teaching session or the training course. It allows interaction with the content without interacting with the teacher, trainer and colleagues.

❖ *Advantages of E-learning* (16), (17)

- Encouraging self-education and supporting the dissemination of a broader concept of continuing education.

- Contributes to increasing the effectiveness of trainers and trainees, and benefiting from information at any time and place.

- Helping trainers and teachers to benefit from technological progress in achieving the quality of the educational process.

- Overcoming the limitations of time and place in the educational process.

❖ *The Teacher's Role in E-Learning(18)*

- Works efficiently as a guide, guide and facilitator of the educational content.

-Follows teaching skills that fit the diverse needs and expectations of students.

- Transforms his classroom from a place where information is transferred steadily and in one direction from the student to the teacher into a dynamic and student-centered room.

❖ *The Student's Role in E-learning*

The student in e-learning bears a large part of the responsibility for his learning. HE must carry out the activities and assignments provided to him by the teacher, through the program, and he must interact with the learning resources .He available through an intermediary and e-learning techniques such as (playing CDs - using Internet browsers or programs For interaction through the Internet (such as chat programs - programs for sending and receiving files) (19).Study Baghzou Sabrina (20) It aimed to identify the opinions of English language teachers in secondary schools in order to determine their attitudes towards integrating e-learning into the subjects they study. The study used a questionnaire to collect data. The results of this study revealed that teachers have a positive attitude towards the potential effectiveness of e-learning in teaching English, and the level of technology use among teachers is the most important factor that affects teachers' use of technologies and controls their attitudes towards the application of e-learning. Adel akram Study (21) .It aimed to provide a presentation on the pros and cons of e-learning from the

students' point of view in the scientific and humanities faculties at Mu'tah University. The questionnaire was used as a tool for data collection, and the study sample consisted of (759) students. Regarding the advantages of the e-learning system, while there are no statistically significant differences between the answers of students in the scientific and humanities faculties with regard to the negatives of the e-learning system. Amal .M study (22): The study aimed to identify the importance of using the e-learning system to teach mathematics using the constructivist model, and a questionnaire was used to find out the viewpoint of mathematics teachers in the Amman schools in the Hashemite Kingdom of Jordan on the importance of applying the constructivist model to teaching mathematics. The study sample consisted of (70) A teacher and a teacher from the security of the Kasbah of Amman, and she concluded that the extent of mathematics teachers' knowledge of the constructivist model and its principles in education corresponds to an estimate of a medium degree, and that the importance of mathematics teachers' use of e-learning in teaching mathematics with the constructivist model corresponds to an estimate of a small degree.H. Elsharkawy Study (23) it aimed to develop the writing skill and reduce the fear of it among secondary school students who study English through the use of some e-learning tools and the use of the writing processes entrance. Confirms the effectiveness of the proposed program. Most of the previous studies confirmed the effectiveness of using e-learning in the different stages of education, as it is one of the most important e-learning techniques.

9.2 Web Quest

The main idea of the web Quest is for students to search for a question and its appropriate solution; and making the student able to pass judgment, analysis and installation. Web Quest consists of the web and requires the availability of a connection to the international information network, and Quest is a question about which the journey revolves, which prompts the student and falls into the necessity of answering (24).

(25) defines web quest as one of the teaching methods used by the teacher, and the student performs the activities required of him based on research from the Internet and in cooperation with his colleagues and the cooperation and participation that exists among students and this leads to the development of thinking about the research topic in a critical manner Which leads to the development of their mental skills.

From the foregoing, we see that web Quest is a new educational strategy that aims at the necessity of providing a structured environment for the computer and the Internet that serves as a supportive structure for learning through the use of a set of basic sources on the international information network predetermined by the teacher in order to codify the research process to avoid searching in a random and unstructured manner. Motivate me to research, investigate and participate in cooperative learning

environments to develop the concept of cooperative learning among students on the one hand, and on the other hand, to develop their intellectual abilities.

- *Types of Web Quest*

1-Short Term Web Quest

The time range is from one to four lessons, the educational objective of which is to access, understand and retrieve sources of information. It is limited to one article. The results of the Short term web Quest are in a simple form like a list of URLs.Web Quest is used by beginners who are not familiar with the techniques of using search engines. And as an initial stage to prepare for the Long term web Quest.

2- Long term web Quest

Ranging between a week and a full month, and contains questions that require advanced mental operations such as analysis, synthesis, and evaluation. The Long term web Quest is presented in the form of oral presentations or in the form of research, and a worksheet for presentation on the network. These presentations may require, in addition to answering the central questions of the task, control of advanced computer tools such as presentation programs such as PowerPoint, or image processing programs, HTML markup language, or multimedia application development programs (26).

- *Components of a web Quest(26),(27)*

1- ***Introduction:*** Depends on the experiences, knowledge and skills previously available to the learners, in which the preparation for the lesson is made and a clear idea of the subject and its elements is given, and the teacher tries in an implicit manner to introduce some new terms, to prepare the learners for the lesson.

2-***Tasks***: It is given an accurate description of what he is expected to accomplish at the end of the cognitive journey, and it includes main and sub-tasks related to real-life situations, and it is required that they be short and based on the learner's previous knowledge, and among the tasks that the student performs during the cognitive journey (collection, tracking, browsing.

3- ***Recourses:*** The teacher provides learners with a specific and carefully selected group, appropriate to the level of learners to help they navigate, including: (web pages, experts that can be made available via e-mail, searchable databases over the Internet, e-books).

4- ***Processes:*** the activity in which the steps of work on the cognitive journey are described and the nature of the work (individually or collectively) determined. If the work is (collectively), the learners are divided into groups, the work is distributed among them, and the specific and clear steps that each student will take to reach the achievement of the task determining the time to complete the task.

5- Evaluation: The main criterion for measuring the skills that the learner will master through activities through modern assessment methods in light of e-learning environments and evaluating his performance, and the extent of his cooperation with his colleagues.

6 ***Conclusion***: A summary of all the previous steps in the form of statements about the task, what was accomplished in it and the extent to which it is possible to extend the questions asked.

7-***Teacher Page:*** A separate page to guide other teachers to design a web quest for other lessons, where the teacher can mention the lesson plan, and the expected results after the lesson is implemented.

- *Web Quest Advantages*

The presence and availability of motivational elements, such as giving a specific role to the learner, or presenting a specific situation and scenario that increases the learner's motivation.

- It saves the student's time while learning as it makes the student not take a long time while surfing and searching online (28).Developing the student's mental abilities, and creating a researcher who is able to investigate the information by himself (29). Successful cooperative learning, which enhances their communication and communication (30).The aim of the study was to find out the effect of teaching using the Web Quest on the achievement of secondary school students in the subjects of history and geology, using the experimental method and achievement test tools. Which studied using web Quest and the study of M. Massad (31): entitled: The effectiveness of web Quest in developing programming skills for third year middle school students. The researcher used the quasi-experimental approach and the study sample consisted of (40) male and female students. Third year middle school students. Mustafa. S study (32).It aimed at developing achievement and students' attitude towards using web quest in learning English. The researcher used the quasi-experimental approach. The study sample consisted of (60) female students of the second year of middle school, who were divided into two groups (experimental and control). Achievement and students' attitudes towards using web quest in learning English for the benefit of the experimental group.

Hanna Ahmed's study (33) aimed at developing mathematics teaching skills among female students at the College of Education in Abha, using the web Quest and relied on the quasi-experimental approach. The study sample consisted of (58) students at the seventh level in the College of Education, and the results showed that there are statistically significant differences at the (0.05) between the mean scores of the students of the experimental and control groups in favor of the students of the experimental group.

And the study of Amira Hamdi (34). It aimed to use the web Quest strategy in developing reflective thinking skills and achievement in psychology for second-grade female students, and the research group

consisted of (61) students, and the results resulted in a statistically significant difference between the mean scores of the experimental group students. Which was studied using the web Quest strategy for the benefit of the experimental group, and the results of the research indicated the effectiveness of web Quest in developing reflective thinking skills and cognitive achievement among students.

And Ahmed Kateh's study (35). It aimed to identify the effectiveness of teaching social subjects web Quest in the achievement of first-grade intermediate students. Quest in teaching social sciences, and the experimental group excelled in the post-achievement test.Most of the studies confirmed the effectiveness of the web Quest strategy in the academic achievement of students and the development of reflective thinking.

9.3 *Reflective Thinking*

And defined (34) as a mental process through which the mental processing of sensory input and information retrieved to form ideas and judge them. It is procedurally defined as the thinking in which the student reflects on the situation in front of him, analyzes it into its elements, and draws the plans necessary to understand it with the aim of reaching the results required by the situation, and evaluating the results in light of the plans laid down and measured through the reflective thinking scale (22).

- *Reflective thinking skills*

Classifies reflective thinking skills into two groups:

Investigation skills

It includes the skills of data collection and analysis, careful examination of information, forming appropriate hypotheses, drawing appropriate conclusions, and providing convincing explanations.

- *Critical thinking skills*

It includes deduction, inference, conclusion, evaluation of arguments and discussions.

And he divided (30) the skills of reflective thinking into five skills, which are:

1-The skill of contemplation and observation: a critical visual vision; It means the ability to meditate, analyze and present the aspects of the problem, identify its content through its components, and visually discover the existing relationship.

2-The skill of detecting inaccuracies: the ability to clarify the gaps in the problem by identifying incorrect relationships and error in accomplishing tasks.

Ahmed Essayed study (30).It aimed to identify the availability of reflective thinking skills among student teachers specializing in the English language and to present a proposed scenario based on the reciprocal teaching strategy to develop those skills at the Faculty of Education in Arish. The study sample consisted of (60) students. Reflective thinking skills and the need for training to use and apply reflective thinking skills in studying and developing the English language. Study (31) it aimed to determine the impact of problem-based learning while teaching the micro-teaching course for students of the second year, primary education division, majoring in English, on the development of students' reflective thinking and their attitudes towards the course. The study sample consisted of (60) male and female students who were divided into two groups, one experimental and the other controlling. The results of the study revealed a statistically significant difference between the mean scores of the experimental and control groups in favor of the experimental group in the post-measurement of the reflective thinking test)(.

Study of Sally Mohamed (33).It aimed to measure the effect of a model in reflective thinking in reading on the development of interpretation skills of secondary school students in language schools. The research sample included (60) and the results showed the effectiveness of using the reflective thinking model in developing the interpretation skills of second year secondary students in language schools.

10..Experimental processing materials and tools

1- Reviewing the literature and studies that dealt with reflective thinking skills and academic achievement in various fields in general and in the field of computer and information technology in particular.

2- Determining the skills of the reflective thinking scale necessary for the students of the second stage of basic education according to the following steps:

-*Determining the goal of the list:* The list aims to identify the most important skills of the reflective thinking scale that are suitable for students of the second stage of basic education and which they should acquire.

- *Derivation of skills:* The skills of the reflective thinking scale were derived by referring to the following sources Computer teachers' guides, thinking books, curricula books, teaching methods, and technological resources

- *Adjusting the list:* to adjust the vocabulary of the reflective thinking scale, it was presented to a group of arbitrators specialized in curricula and teaching methods, psychology, and computers, to express their opinion on the extent to which skills are related to reflective thinking, and their suitability for students of

the second stage of basic education, and modifications have been made. Which the arbitrators referred to, and accordingly.

3- Web Quest for the two units "Web Sites", Introduction to the Java Language" In light of studies and educational design models, a Web Quest design was proposed that consists of six main stages as follows:

* *Analysis phase:* This phase included: analysis of the target group, determining the general goal of the trips, defining the learning tasks and activities, and an analysis of the educational structure.

* *Design and preparation stage*: This stage included: defining educational goals, defining the content of trips, organizing content elements, choosing educational media, designing a list of educational tasks, defining calendar methods, and preparing a map of the flow of knowledge trips across the web.

* *Production phase*: It included: Determining the appropriate design language for the educational site, writing texts, inserting images and graphic forms, and making links between pages.

* *Experimentation phase*: Through two steps: applying the Web Quest evaluation form to a group of specialists, and the second is showing the trips to a sample of students and analyzing the results. The appropriate modifications have been made.

* *Presentation stage*: Uploading the Web Quest to the Internet and updating the information from time to time.

* *Evaluation stage*: It includes: Evaluation of students' learning, and evaluation of the Web Quest

4- The teacher's guide to using cognitive learning journeys via the web to teach the two units "Websites", an introduction to the Java language" from the academic year (2020/2021), and it includes directions for the teacher to use the Web Quest in teaching for the study sample

5- Preparing the study tools

First: The reflective thinking test was prepared as follows

- Determine the objective of the test. It is to measure the availability of reflective thinking skills (the skill of contemplation and observation, the skill of detecting inaccuracies, the skill of reaching conclusions, the skill of giving convincing explanations, the skill of developing suggested solutions) the second episode of basic education in the two web sites units, an introduction to the Java language.

-The initial form of the test: The test was built in its initial form, which contains (33) items of the type of multiple choice distributed over the five skills of reflective thinking for each skill.

TABLE 1: *SPECIFICATIONS TABLE FOR THE REFLECTIVE THINKING SCALE*.

Skills	Vocabulary	Total
visual vision	1,2,3,4,5,6,7,8, 9	9
Detecting fallacies	10,11,12,13,14 ,15,16	7
Come to conclusions	17,18,19,20,21 ,22,23,24	8
Giving convincing explanations	25,26,27,28	4
Develop suggested solutions	29,30,31,32,33 ,34,	5

-The validity of the test: it was presented to specialists in the field of curricula and teaching methods, and in the field of teaching and computer technologies. The amendment was made and the test became valid for application to the exploratory sample

-The exploratory experiment of the test: the test was applied to a survey sample consisting of (30) students from the second stage of basic education from outside the study sample, with the aim of calculating the test stability coefficients

- Stability coefficients of the test: Calculating the stability of the test reflective thinking and its sub-skills

The value of the stability coefficients for the reflective thinking scale and reflective thinking skills ranged between (0.75-0.81) for skills, and the reliability coefficient for the scale as a whole was (0.83), which is an acceptable stability ratio, which reassures researchers of the results of applying the scale Table (2)

TABLE 2: *CRONBACH'S ALPHA TEST RESULTS FOR THE REFLECTIVE THINKING AND SKILLS SCALE*.

Skills	Cronbach's alpha test	Number of Questions
visual vision	0.75	9
Detecting fallacies	0.76	7
Come to conclusions	0.74	8
Giving convincing explanations	0.81	4
Develop suggested solutions	0.75	5
Reflective Thinking Scale	0.90	33

Test discrimination coefficients: between (0.47- 0.87), and a paragraph is good if its discriminatory strength is (0.30) according to the AIBEL standard. The higher the positive paragraph discrimination coefficient, the better the paragraph indicates that the discriminatory ability of the scale is appropriate.

TABLE 3: *CORRELATION COEFFICIENTS BETWEEN THE TOTAL SCORES FOR EACH OF THE REFLECTIVE THINKING SKILLS AND THE TOTAL SCORES ON THE SCALE*.

Skills	Correlation coefficient	Level of Significance	Statistical significance
visual vision	0.85	0.01	significance
Detecting fallacies	0.81	0.01	significance
Come to conclusions	0.88	0.01	significance
Giving convincing explanations	0.82	0.01	significance
Develop suggested solutions	0.71	0.01	significance

Table (3) shows the correlation coefficients between the total scores for each of the reflective thinking skills and the total scores for the scale between (0.71 - 0.88), all of which are statistically significant, and indicate the validity and homogeneity of the reflective thinking skills, and thus the skills are considered valid for what they were designed to measure.

-The final form of the test: the test in its final form consists of 33 questions, and a score was given for the correct answer and zero for the wrong answer, thus the final score for the test is 33.

Scond: Preparing the achievement test in the two websites units and the entrance to the Java language

An achievement test has been prepared that measures the cognitive aspects included in the units "websites" and "an introduction to the Java language" to be developed for students of the second stage of basic education in the light of the behavioral goals expected to be achieved by the sample members, and in light of the learning content of the units "websites entrance to the language" In Java, where the test consists of (40) items of the multiple-choice pattern, and each item includes (4) alternatives, only one alternative is chosen, through the following steps:

- Determining the objective of the test: measuring the cognitive aspects associated with the two web sites and an introduction to the Java language

- Preparing the achievement test specification table and formulating test vocabulary formulating the test vocabulary in a multiple-choice style, and the number of test items reached 40 items.

-Discrimination coefficient for achievement test vocabulary:

Between (0.47 - 0.93), which are acceptable discrimination coefficients because they are higher than (0.1) and the paragraph is also good if its discriminatory power is (0.30) according to the Aibel) standard. It indicates that the paragraph is good if its discriminatory strength is (0.30 and that the discriminatory ability of the test is appropriate.

TABLE 4: *IT SHOWS THE RESULTS OF THE CRONBACH'S ALPHA TEST FOR THE ACHIEVEMENT TEST AND ITS SUB-COMPONENTS.*

Achievement levels	Number of Questions	Cronbach's alpha test
Rememberin g	17	0.87
Comprehens ion	7	0.72
Applying	7	0.79

Analyzing	1	-
Synthesis	6	0.73
Evaluation	2	0.61
Achievement Test	40	0.91

Table (4): shows the value of the stability coefficients for the achievement test between (0.61 - 0.87) for the levels of achievement, and the reliability coefficient for the test as a whole was (0.84), which is an acceptable stability percentage.

The validity of the test

It was presented to a group of arbitrators, and the arbitrators agreed on the appropriateness of the achievement test to develop academic achievement, and this is a good indication that the achievement test enjoyed an acceptable degree of validity that allows it to be used to achieve the objectives of the research.

•*Pre-application of the research tool:* The study tools of testing reflective thinking skills and academic achievement were applied to the experimental group and the control group to ensure that the two groups were equal. At the level of significance (0.05), this shows that there is no statistically significant difference between the experimental and control group in the reflective thinking skills test, and therefore we find that the experimental and control groups.

• *Post-application of study tools:* The study tools represented in testing reflective thinking skills and academic achievement were applied on the experimental group and the control group afterwards, in order to compare the results of the two groups to calculate the significance of the difference between them.

•*Statistical processing*

To test the hypotheses of the study, arithmetic means, standard deviations, and t-test for two independent samples were used to compare the scores of the reflective thinking test for the two study groups and to find the effect size to know the contribution of the experimental variable to the dependent variables.

TABLE 5: *THE SIGNIFICANCE OF THE DIFFERENCE BETWEEN THE MEAN SCORES OF THE EXPERIMENTAL GROUP STUDENTS IN THE PRE AND POST APPLICATIONS OF THE REFLECTIVE THINKING SCALE*

Skills	**Scale application**	**Average Score**	**Standard Deviation**	**T-Test**			**Statistical Significance**
				T Values	**Degrees of Freedom**	**Level of Significance**	
visual vision	Pre application	2.80	1.13	14.58	29	0.001	Significant
	Post application	7.37	1.16				
Detecting fallacies	Pre application	2.17	0.87	12.82	29	0.001	Significant
	Post application	5.40	0.13				
Come to conclusions	Pre application	2.63	1.00	19.41	29	0.001	Significant
	Post application	6.20	1.37				
Giving convincing explanations	Pre application	1.50	0.51	13.73	29	0.001	Significant
	Post application	3.23	0.73				
Develop suggested solutions	Pre application	1.90	0.88	10.83	29	0.001	Significant
	Post application	4.00	0.87				
Reflective Thinking Scale	Pre application	11.00	2.32	27.98	29	0.001	Significant
	Post	26.20	2.93				

	application						

11. RESULTS

Test the validity of the study's hypotheses, which states that: There is a statistically significant difference between the mean scores of the experimental group students and the control group students in the post application to test reflective thinking skills. The "t" test was used for two unrelated averages to find out the significance of the statistical differences.

From Table (5) there is a statistically significant difference between the scores of the experimental group students in the reflective thinking scale (skills and total score) in favor of the post-application.

- The level of the experimental group students in the post-application increases significantly if compared to their level in the pre-application of the scale.

- The results of the "T" test to indicate the differences between the mean scores of the experimental group students in the two applications before and after the reflective thinking scale. All the mean scores of the experimental group students in the post application of the reflective thinking skills are higher than in the tribal application, and the "T" values are between (10.83 - 19.41), all of which are significant at the significance level (0.01).

- The reflective thinking scale as a whole, the average total score of the experimental group students in the pre-application was (11.00) and their average score in the post-application was (26.20), and the T-value was (27.98) and the significance level was (0.01), which indicates the existence of a statistically significant difference. Between the scores of the experimental group students in the reflective thinking scale in favor of the post-application.

TABLE 6: *IT SHOWS THE SIGNIFICANCE OF THE DIFFERENCES BETWEEN THE AVERAGE SCORES OF STUDENTS OF EXPERIMENTAL GROUP IN THE PRE AND POST APPLICATION OF THE ACHIEVEMENT TEST*

Achievement Levels	**Study Groups**	**Average Score**	**Standard Deviation**	**T-Test**			**Statistical Significance**
				T Values	**Degrees of Freedom**	**Level of Significance**	
Remembering	**Pre applicatio**	**6.10**	**1.99**	**20.88**	**29**	**0.001**	**Significant**

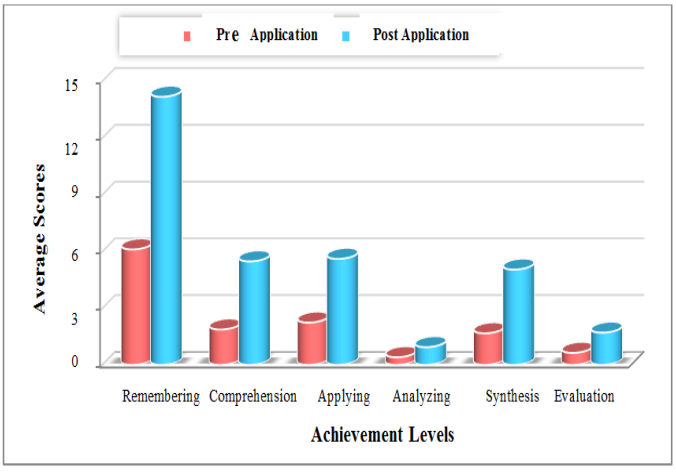
	n						
	Post application	**14.17**	**1.42**				
Comprehension	**Pre application**	**1.87**	**0.90**	**15.46**	**29**	**0.001**	**Significant**
	Post application	**5.47**	**0.94**				
Applying	**Pre application**	**2.23**	**0.97**	**14.49**	**29**	**0.001**	**Significant**
	Post application	**5.60**	**1.07**				
Analyzing	**Pre application**	**0.40**	**0.50**	**5.75**	**29**	**0.001**	**Significant**
	Post application	**0.93**	**0.21**				
Synthesis	**Pre application**	**1.67**	**1.09**	**12.72**	**29**	**0.001**	**Significant**
	Post application	**5.03**	**0.81**				
Evaluation	**Pre application**	**0.63**	**0.61**	**8.45**	**29**	**0.001**	**Significant**
	Post applicatio	**1.70**	**0.47**				

	n						
Achievement Test	**Pre application**	**12.90**	**2.98**	**32.77**	**29**	**0.001**	**Significant**
	Post application	**32.90**	**2.12**				

In Table (6) shows T-test results of the significance of the differences between the average scores of students of experimental group in the pre and post application of the achievement test; where all the average scores of the experimental group students in the post application of the achievement levels were higher than in the pre application as well as the "T" values ranged between (5.75-20.88) for achievement levels, all of which are statistically significant at the level of significance of (0.001).

The total scores average of the experimental group students in the pre application were (32.90) and the total scores average of the post application were (21.37), while the “T” value was (20.95) and the level of significance was (0.001); which indicates there is statistically

Figure1*: shows that the averages scores of the experimental group students in the post application of achievement levels are higher than the averages of their scores in the pre- application.*



12. RECOMMENDATIONS

- A study of the use of web quest in developing innovative thinking among talented and talented people.

-Studying the effectiveness of web quest in developing reflective thinking and academic achievement in computers for secondary school students.

-A training program to qualify student-teachers to design and use modern strategies in teaching, such as the web Quest.

SCREENS OF THE PROPOSED SYSTEM

Figure 2: *log in screen*

Figure 3: *Intro screen of Interface*

Figure 4: *First activity screen*

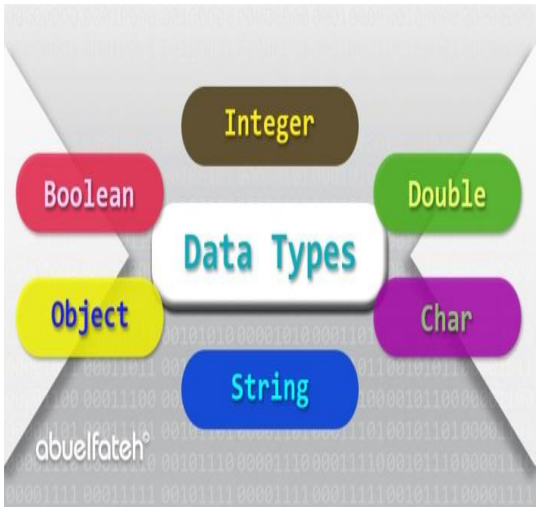
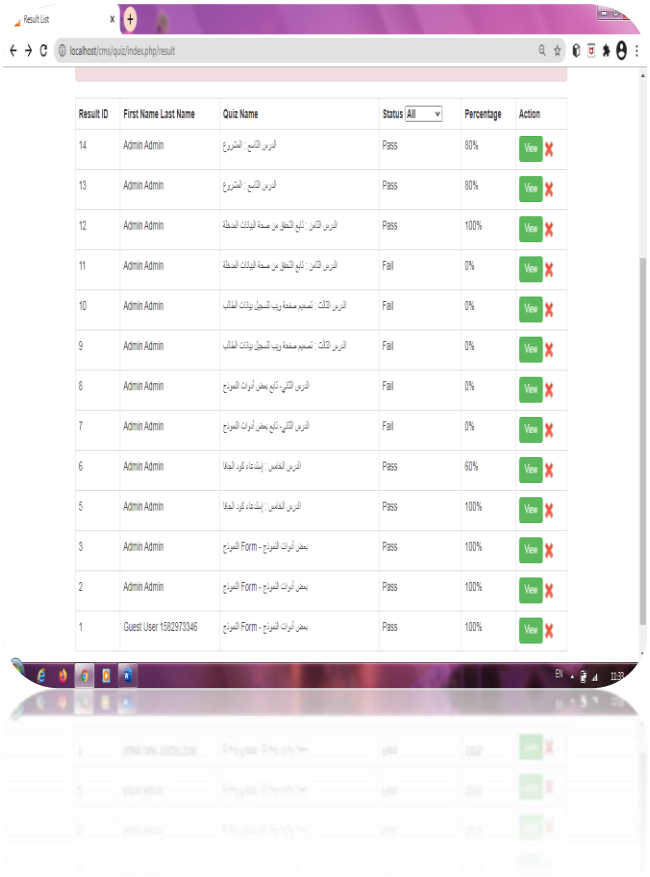


Figure 5: *Third activity screen*

Figure 6: *Tests screen*

Figure 7: *Test results screen*



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