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The Effectiveness of Digital Assessment Tools on the Educational Platforms Based on Science Evaluation Standards at the Secondary Stage

[1]Anwar Hasan Gaafar

[1]Lecturer of Remote Sensing, Faculty of Remote Sensing and Geophysics

Abstract

The current research aims to identify the effectiveness of digital assessment tools across educational platforms in light of science evaluation standards in secondary school in Iraq from the point of view of science teachers and supervisors, the descriptive methodology was used to verify the effectiveness of digital assessment tools. The research sample included (87) male and female teachers, (28) male and female supervisors, and the research tool was to identify the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards at the secondary stage. The research reached a number of results, the most important of which are: that the best standards in terms of availability and use are the general standards for the final achievement tests; Where the degree of availability and use was at a "significant" level with a relative weight of (3.71), followed by its technical standards in the educational platform; Where the degree of availability and use was at a "significant" level with a relative weight of (3.64), followed by the general criteria for digital achievement files; Where the degree of availability and use was at the "medium" level with a relative weight of (3.37), followed by the technical standards for it in the educational platform; Where the degree of availability and use came at a " significant " level with a relative weight of (3.14), and there are no statistically significant differences attributed to the taxonomic research variables (job, gender, specialization, years of experience) for the research sample.

Keywords: tools - digital assessment - educational platforms - standards - science evaluation - secondary stage.

INTRODUCTION

The world in which we live is characterized by scientific progress and technological development, and the institutions and bodies of society have been affected by everything that is new, in the face of the crisis of the Corona pandemic that has been witnessed by all countries of the world. This imposed a curfew on citizens, leading educational institutions to move from formal education based on compulsory attendance to e-learning based on distance learning.

Science curricula are among the curricula taught at all levels of study, and many efforts have been made to develop them in recent years in terms of form and content. In terms of form, all science books are characterized by good specifications, and each course has a teacher’s guide and a student guide, and in terms of content, all its curricula are built on scientific and educational foundations that keep pace with international standards for science education. The teacher's role has become a planner, designer, observer, facilitator, mentor and an evaluator for students’ learning. In addition to including applied aspects through which science is linked to technology, and daily practice, which adds fun to science learning, and imposes an urgent need for developing the implementation of science curricula and evaluating the learning of its students with high efficiency (Al-Subaie, 2017).

The digital assessment process is one of the elements of developing the educational process under the current circumstances. To verify the extent to which the cognitive, skill and emotional goals are achieved, and an alternative

to the traditional assessment based on classroom questions in the existing lessons that are concerned with remembering information, and its poor measurement of the general performance level of knowledge, and the skills associated with it; Therefore, there was a need to use modern methods and tools based on an alternative evaluation that focuses on the comprehensive performance-based evaluation (Abdul Qadir, 2020; Allam, 2009).

There are many digital assessment tools for science, including achievement files, note cards, questionnaires, interviews, and achievement tests (Al-Hamshari, 2016, p. 151); In this direction, recent trends in education indicate the use of effective tools to implement the comprehensive performance evaluation process based on performance, including electronic achievement files as an alternative to daily follow-up in schools, and electronic achievement tests at the end of the school year as an alternative to paper exams, and in line with technical developments, especially those related to new applications. For e-learning via social networks (Krkovic, 2014).

The assessment with electronic achievement files (portfolio) is one of the alternative assessment methods for science curricula. It focuses on important processes that can be developed for students within the framework of school work, including identifying the educational needs of students, and acquiring a wide range of knowledge and skills; Where he monitors his performance by himself, it also allows different interests to solve the problems that arouse the student's interest and thinking throughout the school year, in addition to saving the teacher's time and effort in reviewing it (Al-Subaie, 2017; Allam, 2009).

- In this direction, a number of studies have been carried out to demonstrate the importance of electronic achievement files in science, including the study of Al-Subaie (2017), whose results indicated the impact of employing the electronic achievement file to teach chemistry in the learning environment to develop reflective thinking, and the study of Al-Khaibri and Al-Ahmad (2016), the results of which indicate that teachers, students and guardians agree on the effectiveness of the evaluation using the Science Achievement File, by identifying the weaknesses and strengths of female students, increasing self-confidence, diversifying learning methods, developing ways of thinking, creating positive trends towards the future, as well as increasing teacher and guardian knowledge of student level. And the study of Al Misfer, Al-Shayeb and Faraj (2012), whose results indicated the effectiveness of the electronic achievement file over the traditional achievement file in developing students' achievement in chemistry, and developing a positive attitude towards chemistry. The study recommended the importance of using the academic evaluation for various aspects of learning using the electronic achievement file as an alternative to traditional paper-based evaluation tools.

- Therefore, the importance of achievement files, especially electronic, in the evaluation of students' education for secondary science curricula is evident in their different courses of chemistry, physics and biology, under the current conditions of teaching throughout the school year through digital educational platforms, as these materials contain multiple aspects of learning - cognitive, skilled and emotional - and to measure students' achievement in science at the end of the school year using electronic tests.

- Electronic tests are one of the assessment tools in modern trends of learning, through which it is possible to judge the extent to which educational goals have been achieved, and the effectiveness of teaching methods and strategies, activities and teaching aids, and the learner's preparations for learning, as well as on the learning resources used in teaching, and these tests are done by computer technologies, and internet networks (Kapley, 2011).

- In this direction, Zeitoun (2005) clarifies the importance of electronic tests in revealing the strengths and weaknesses in the educational process, and on collecting information about the student's learning achievement of the content of science or any other subject, and providing the student with feedback on achievement, with the aim of improving the teaching and learning process, and to increase the motivation of the learner to learn.

- Electronic tests are distinguished from traditional tests by the ease of reviewing them, detecting mistakes, and correcting their items quickly and with high accuracy, and the ability

to provide dynamic multimedia stimuli such as sound, image, animation, etc. without the need for additional special devices. It is also characterized by its ability to keep records and data for a long time, through which studies, comparisons and policy reviews can be done in an easy and quick way that saves time and effort (Ryan, Scott, Freeman, & Patel, 2000).

• In this direction, many studies and research indicated the importance of electronic tests as a tool for the final evaluation of learning, and the extent of their impact on other variables, including the study of Al-Abri and Salim (2017), whose results revealed the positive impact of electronic tests on cognitive achievement in science and its levels of knowledge, application and inference, as well as reducing test anxiety and its psychological, social, physical and cognitive dimensions.

Despite the importance of the online digital assessment at the present time, some studies confirmed the existence of some problems and obstacles that students and teachers faced in the digital assessment of science curricula in general and physics in particular, as indicated by the results of the study of Bani Domi and Al Shunnaq (2005), which clarified these problems in Weak availability of Internet services in schools and some students, insufficient computers in schools as well as among students, in addition to the technical problems that appear when dealing with computers and the Internet, and the lack of equipment in schools such as printers, headphones and printing paper, and the lack of computer equipment for teachers, and their lack of experience In dealing with it, and the lack of availability of technical assistance when you need it.

• In light of the varying results of previous studies and research that emphasized the importance of benefiting from scientific and technological progress in education to achieve the principle of equal educational opportunities, and to confront the problems facing education in its traditional form, through the use of some digital assessment tools via electronic platforms as a parallel assessment environment or an alternative to the regular assessment, and by reviewing previous studies and research, it was found that there were no studies - within the limits of researcher's knowledge - that were concerned with measuring the effectiveness of digital assessment tools across educational platforms; Therefore, the current studies seek to reveal the effectiveness of digital assessment tools across educational platforms in light of science evaluation standards at the secondary stage.

Research Problem

• Given the urgent need to use digital assessment tools across electronic platforms and the changing difficulties and challenges faced by users due to its modernity and total reliance in times of epidemics, including the spread of the COVID- 19 pandemic, and bringing the world to an unknown state of affairs; There was a need to identify the effectiveness of electronic achievement files to evaluate learning throughout the academic year, and electronic achievement tests at the end of the academic year; In order to confront this pandemic and adapt to it, the results of some educational studies, including the study of Al-Misfer, Al-Shayeb and Faraj (2012), whose results indicated the effectiveness of some electronic assessment tools on the traditional methods of assessment, including the electronic achievement file, and the study recommended the importance of using academic assessment for various aspects of learning using Electronic Achievement File as an alternative to traditional paper evaluation tools.

• In light of the results of some previous studies and research, some of which confirmed the achievement of some successes when using digital assessment tools in the process of evaluating students' achievement in science education, including the study of Al-Abri and Salim (2017), Al-Khaybri and Al-Ahmad (2016), Al-Shayeb and Faraj (2012); But on the other hand, the results of some studies indicated that there are some shortcomings in the digital assessment, including the difficulty of measuring some knowledge and skill areas with it, as well as the unsafe handling of information, including the study of (Dumi and Al-Shanaq (2005), the study of (Oakley, et al, 2014), and the study of (Dermo, 2009).

• Some international conferences have also noted the importance of the gradual transition from traditional to e-education, or the practice of e-education alongside traditional education, including the Fourth International Conference on E-Learning and Distance Learning (2015), the results of which

emphasized the creation of an interactive learning environment conducive to education and creativity, development of skills and experience to generate knowledge, developing productivity in all aspects of learning and ensure high-quality output, and the need to shift from a traditional (paper) to an electronic image in the so-called digital assessment; To reach future learning milestones according to the aspirations of the educational system that seeks efficiency and effectiveness.

• In addition to some remote (unregulated) electronic interviews with some secondary school science teachers and supervisors, the results of which emphasized the importance of the digital assessment in light of some of the problems facing education in its traditional form, including the spread of diseases and epidemics, long distances, and others.

• In light of the varying results of previous studies and research that emphasized the importance of benefiting from scientific and technological progress in education to achieve the principle of equal educational opportunities, and to confront the problems facing education in its traditional form, through the use of digital assessment tools through electronic platforms; Therefore, the current research sought to reveal the effectiveness of digital assessment tools across educational platforms in light of the standards of science evaluation at the secondary stage in Iraq, this was crystallized in the following main question:

What is the effectiveness of digital assessment tools across educational platforms in light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors?

• This main question is divided into the following sub-questions:

1. What are the standards of digital assessment tools across educational platforms in light of the standards of science evaluation at the secondary stage from the point of view of experts and specialists?

2. What is the effectiveness of digital achievement files across educational platforms in light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors?

3. What is the effectiveness of digital achievement tests across educational platforms in light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors?

4. How different are the responses of the research sample of teachers and supervisors of science to the effectiveness of digital assessment tools across educational platforms in light of the standards of secondary science evaluation in light of variables (career, type, specialization, years of experience)?

Research Objectives

The current research sought to verify the following:

1. Determining the standards of digital assessment tools across educational platforms in light of the standards of science evaluation in the secondary stage from the point of view of experts and specialists.

2. Recognizing the effectiveness of digital achievement files across educational platforms in light of the standards of science evaluation in the secondary stage from the point of view of science teachers and supervisors.

3. Recognizing the effectiveness of digital achievement tests across educational platforms in the light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors.

4. Determining whether there are differences between the responses of science teachers and supervisors to identify the effectiveness of digital assessment tools across educational platforms in light of science evaluation standards at the secondary stage, which can be attributed to the variable of (gender, occupation, and years of experience).

The Importance of Research

The results of the current search may benefit the following categories:

- Students: It is represented in improving some general characteristics, and technical digital assessment tools (achievement file - achievement tests) through educational platforms to provide ease of handling, provide equal educational opportunities, and take into account individual differences by moving from

traditional education to distance education using digital platforms.

- Those in charge of the educational process: helping public education officials to provide a modern style of distance education evaluation using digital platforms in light of science evaluation standards for the secondary stage.

- Curriculum designers: Reorganizing the content of science curricula at the secondary stage in light of digital assessment through educational platforms.

Science teachers and supervisors: Providing means of follow-up, guidance and evaluation in light of digital assessment through educational platforms.

- Education developers: Improving and developing the digital education assessment through educational platforms, to suit the current stage of the spread of epidemics and microbes.

- Researchers: by providing a questionnaire for the effectiveness of digital assessment tools across educational platforms in light of the standards of science evaluation at the secondary stage.

Research Limits

The results of the research were circulated to the following limits:

- Objective limits: represented in the effectiveness of digital assessment tools (achievement file - achievement tests) across educational platforms in light of science evaluation standards at the secondary stage.

- Time limits: The first semester of the 2020-2021 school year.

- Spatial boundaries: Research has been carried out in the directorates and schools of public education in Iraq.

- Human limits: some science teachers and supervisors in secondary education schools in the three school stages.

Research Methodology

To achieve the objectives of the research, the descriptive analytical method was used, to reveal the effectiveness of digital assessment tools across educational platforms in light of science evaluation standards at the secondary stage.

Research Tool

The current research tool was a questionnaire to reveal the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards at the secondary stage.

Research Terminology

Digital Assessment Tools:

Cigdem & Oncu, 2015 defined the digital assessment as: to evaluate learners and determine their level of learning and progress in the study of courses through the use of available technologies and programmes, and the devices and networks they need (p972).

The current study defines digital assessment tools as a set of methods, interactive tools based on specific normative bases, including electronic achievement files, and electronic tests used by science teachers as an alternative to traditional assessment tools, and aimed at evaluating students' progress in learning chemistry, physics and biology.

Electronic Achievement File

Gulbahar, & Tinmaz, 2006 defined the electronic achievement file as: a set of learner's actions and reflections that show his growth throughout the educational process, stored in electronic forms, and the main idea behind its use is to make the learner focus on the learning process more than the product, as electronic achievement files are part of the learning process and not a result of it (p. 316).

The current study defines the electronic achievement file procedurally as: the electronic portfolio of the educational platform for the work and activities of secondary school students in science, electronic multimedia (audio, pictures, video, texts) via the Internet; It aims to continuously evaluate the work done by the students to improve their performance.

Electronic Tests

- Clapp (2016) defined electronic tests as: Regular continuous learning process aimed at remote evaluation of student performance using electronic networks.

- The current study defines procedural electronic tests as: The use of electronic learning platforms to assess students' knowledge and skills in science at the secondary level, and it is performed inside the equipped classrooms or remotely through the Internet from home.

Digital Educational Platforms

Ibrahim (2011) defined digital educational platforms: as an educational environment based on the synthesis of a set of teaching and learning tools and means; In order to create a synchronous or asynchronous interactive environment aimed at serving the learner and the teacher and enhancing the learning process; This is to provide programs and courses electronically by relying on multimedia technology and various communication tools such as e-mail, instant chat, mailing lists, forums, and electronic groups (p. 11).

The current research defines it procedurally as: "An integrated environment of interactive educational services via the internet that provides teachers and learners who participate in education, simple technical characteristics, interactive digital content, multimedia and interaction tools to support and enhance the provision and management of educational and pedagogical services, and to evaluate students to achieve the desired educational goals."

The Theoretical Framework of the Research

The theoretical framework deals with the research variables in three main axes, the first of which is related to digital educational platforms, in terms of: what they are, examples of them at the Arabic and English levels, and their benefits. The second of them relates to the criteria for evaluating science, in terms of: their nature, principles, determinants, and standards indicators, and the third of them is related to the digital assessment, in terms of: what it is, its characteristics and features, and tools, including achievement files and digital achievement tests, and we summarize them as follows:

Digital Educational Platforms

Educational literature has identified digital educational platforms as a cross-cutting term that describes a wide range of ICT systems used to deliver and support learning; It combines communication and sharing tools, and provides a secure space for individual work online, to enable teachers to manage and customize content according to their needs, track students' progress, and assess their achievement.

In this direction, Pour (2014) defined digital educational platforms as: a tool of educational technology that helps teachers and students in the teaching and learning processes; Where the individual can use it to improve aspects of their scientific career, study and evaluation.

There are many examples of foreign and Arab educational platforms. At the foreign level, there is the Edunao platform, the free foreign Zoom platform, in addition to the paid Microsoft platform; Each of them provides lectures and educational courses for different age groups, university and school (Mei, 2012); One of the Arab platforms is (Rawafd), and it is unique in its importance as it is the first in the Arab world, and it provides interactive content that serves many curricula. It also provides a system for tests, contributes to raising the level of students' achievement, and increases their motivation towards learning (Khalifa, 2008).

From the above, it is clear that e-learning platforms are a technological tool, used to facilitate the presentation of educational material to the learner, increasing his motivation to learn through easy access to information from multiple sources, because the platforms provide characteristics and advantages in the educational field, and they also help to monitor students' progress in learning, and measure their achievement through the available assessment tools.

Benefits of Digital Educational Platforms

Digital educational platforms contribute to providing an interactive learning environment that employs all kinds of web technologies, combines the advantages of digital content management systems, and social networks, and enables teachers to disseminate lessons and goals, set assignments, exchange ideas and opinions between the student and the teacher, contact and communication support, in addition to electronic tests Allowing students and parents to see the result, which helps to achieve high quality educational outcomes.

Educational platforms have multiple benefits, as indicated by the Rogers Study (2009), which allows students to share their work with their teachers and guardians; It is based on the

distance learning system, which allows the use of e-mail and voice system to explain and allows students to comment, thus providing a flexible e-learning environment for the learner, as well as immediate and deferred evaluation of student learning, and can also be used to measure the student's achievement.

- From the above it is clear that educational platforms are used to display scientific content and follow up on students' learning by presenting their activities and duties, periodic follow-up to them during learning, measuring their learning achievement, and monitoring and storing their grades. The current research focuses on the effectiveness of digital assessment across educational platforms in light of the standards of science evaluation at the secondary stage.

Science Evaluation Standards

The science education standards for the secondary stage are represented in a set of criteria that determine what the student should know and be able to do through the science subject. It is based on four basic principles represented in teaching science to all students, and teaching science is an effective process through mental and practical activity. School sciences reflect the cultural traditions that characterize contemporary science practice, and improving science education is part of the organized educational reform (Al-Najdi, Abdel-Hadi, and Rashid, 2005).

The international standards for science education are defined as indicated by Al-Tantawi (2009) as follows:

- Familiarity with information and knowledge about the natural world, and its understanding.

- Use appropriate scientific processes and principles in making personal decisions.

- Conscious participation in public conversation and discussions on scientific and technological matters.

- Using the information and skills of a scientifically educated person in his future profession.

Science evaluation standards according to the International Standards (NSES) represent the fourth area, and include assessment criteria for measuring and analyzing students' achievement, and the opportunity available to them to teach science. It includes the bases that can be used to judge the quality of assessment practices in science teaching, whether it is formative or an aggregated assessment, and assessment criteria that take place inside and outside the classroom, as indicated by (Al-Rubaa and Al-Ayasra, 2017, p. 182) and summarized as follows:

First Criterion: The assessment must be consistent with the purposes for which it was found, and its performance indicators are:

- Assessment tools are closely related to the objectives.

- The purposes of the assessment for students are determined in advance.

- Assessment tools are intentionally prepared.

Second Criterion: evaluation includes achievement and opportunities for students' learning, and its performance indicators are as follows:

- The assessment focuses on the scientific content in student learning.

- The assessment focuses on students' achievements (realistic evaluation).

- The assessment balances learning opportunities with student achievement.

Third Criterion: Assessment practices must be fair, and its performance indicators are as follows:

- The assessment takes into account the diversity of evaluation strategies and tools.

- Assessment tools use statistical means and methods.

- Assessment tools are appropriate to students' abilities.

Fourth Criterion: The inferences reached through the assessment data must be accurate and solid, and its performance indicators are as follows:

- Assessment tools are honest and consistent.

- Assessment tools are comprehensive.

- Assessment tools are continuous.

- The Assessment develops self-assessment skills in students.

From the foregoing, it is clear that the criteria for evaluating science in accordance with the International Standards (NSES), is that the assessment must comply with the objectives for which it was established, and the assessment also includes achievement and opportunities for students' learning, and its practices must be fair and honest, in addition to the inferences that are being reached to through the assessment data should be accurate and robust, and these qualities can be available through online educational platforms through the digital assessment.

Digital Assessment

Digital assessment is one of the branches of educational evaluation science that reflects the complete interaction between evaluation and technology, as many areas of evaluation have been affected by the computer, but they are more affected and related to evaluation in the areas of building testing tools, conducting them, and analyzing their data. The digital assessment is preferred over the traditional evaluation; As it helps in assessing students' comprehension, recording their responses, analyzing them, showing their results, and storing them.

Abdul Aziz (2008) defined the digital assessment as: the continuous and regular process that aims to evaluate the student's performance remotely using the electronic network (p. 26).

Ismail (2009) defined it as: a technical process represented in the employment of information networks, computer equipment, software accessories, and multi-source educational material, using assessment to collect and analyze students' responses in a way that helps the teacher determine the effects of educational programs and activities to reach a codified judgment based on quantity data or quality related to academic achievement (p. 393).

From the above it is clear that the digital assessment includes the use of information technology in any activity that involves assessing skills, knowledge or achievement, and it is a continuous and regular process that aims to evaluate the student's answer remotely using the Internet instead of a written assessment or on paper.

Characteristics and Features of the Digital Assessment

There are many characteristics of the digital assessment, as indicated by Ismail (2009, p. 412), Nacheva & Green, (2016), and (Tomas, et al, 2015), and we summarize them as follows:

- Building, modification and development: the teacher can design and produce the electronic calendar easily, and modify it flexibly through ready-made software and open internet sites, as well as through question banks.

- Interactive: which means the learner's response to the digital assessment environment by pressing one of the keys through the mouse, writing text, specifying a specific place, and other responses.

- Diversity in multimedia elements: which can include tasks of evaluating a lot of information and in which text, audio and image are integrated.

- Instant test correction: In which modified copies of the same test can be prepared by randomly rearranging the test questions in order to save time and effort.

- Availability: which is the possibility of applying it without specifying a specific place or time for its completion and delivery.

- Keeping special records of students' answers and the possibility of printing them on hard copies when needed.

- Question bank: which is the use and analysis of data and the ability to store questions on storage media.

- Comprehensiveness and integration: covering most of the course objectives in addition to its use in measuring the higher levels and abilities of students.

- Diverse and immediate feedback: enables the teacher to employ various forms of feedback; Such as: (texts - images - sounds - videos, etc.), and they are immediate for all learners.

- Extreme accuracy in assessment and grade monitoring, and test validity and reliability.

Objectives of the Digital Assessment Application:

The objectives of the digital assessment as indicated by Hung (Hung, 2007, p 56) are as follows:

- Effectively employing digital technology in the educational process to achieve quality standards in the assessment.

- Spreading the culture of employing digital technology in education, to create an electronic society that keeps pace with the developments of the times.

- Reducing material costs in the educational process, such as papers, printing, and others.

- Training teachers to build modern digital assessment methods to measure all aspects of the educational process.

Digital Assessment Tools:

There are many methods or tools for evaluating students' education through digital platforms, and they are divided into methods for electronic formative evaluation during learning, the most important of which are digital achievement files, which are the collection of students' work that illustrates their achievements, progress in education and their reflections on them, and may include learning projects etc. While the electronic diagnostic and summative assessment methods are among the most important of which are digital achievement tests, in which students show what they have achieved in their learning, through their written answers to electronic questions in which international standards for formulating questions and the way to answer them are met.

A. Digital Achievement File

The achievement file is a digital record or portfolio for collecting the best works and outstanding tasks for the learner, including lessons, assignments, projects, and various exercises in a course or curriculum. These works are presented through multimedia such as texts, sounds, video scenes, still images, graphics and presentations, and the components of the file are navigated using links, and it can be published on the Internet or downloaded on a CD, showing the learner's ability to use and apply scientific knowledge in life situations.

Gulbahar & Tinmaz (2006), explain that the electronic achievement file is a set of students' work and activities that show their educational growth throughout the school year and are stored in electronic forms. The main idea behind its use of technology is to make the learner focus on the learning process more than the output. It is a part of the learning process, not a result of it.

There are many advantages of using digital achievement files in education, as indicated by Rabat and Al-Masry (2011), and we summarize them in the possibility of storing its contents and appendices on compact tapes, and the presence of an electronic index that helps the evaluator to identify the sections he is interested in, and the dynamism of the presentation of information, and does not need to turn pages when examining it's components; It can be revised visually from the computer screen without trouble, and the possibility of presenting information in a variety of forms, such as: animation, simulation, television imagery, multimedia projects and presentations.

B. Digital Achievement Tests

Digital tests are one of the digital calendar tools through which the student's learning or acquisition of the content of the scientific material can be diagnosed electronically, and it contributes to overcoming the negatives of paper tests such as cheating and high cost, in addition to the transmission of diseases through papers as well as through merging with others in the current circumstances.

Ismail (2009) explains that digital tests are a continuous and codified evaluation process that aims to measure the student's performance electronically using software synchronously with direct connection to the Internet or asynchronously in the electronic classroom.

The digital tests are characterized by many advantages as indicated by Al-Balawi (2013) in the effectiveness in application and correction, low cost, maintaining the confidentiality of the tests for a long period, the increase in the extent of validity and reliability of electronic tests, lack of comprehension errors resulting from the test process, which leads to accurate comprehension and understanding and good communication between the student and the electronic test program.

While Mandour (2013, p. 41) pointed out some of the difficulties facing electronic assessment in general in the weakness of the technological skills of the teacher in preparing digital assessment tools, the weak skills of the student in responding to them, and the lack of computers or good internet connection in some places.

Also, the difficulty of correcting essay questions, the possibility of failures during the assessment, cheating by others, and cheating from unauthorized sources, some students answering the test impersonating another, measuring higher skills is difficult in objective tests.

These difficulties can be overcome through the provision of a range of training courses for those in charge of the test including teachers, technicians, observers and students to ensure that the test is performed properly. To continuously improve the quality and maintenance of the network to avoid failures that may hinder students while performing the test, to provide a technical support team with sufficient expertise to deal with devices and networks, and to provide adequate protection to the database of digital platforms to prevent access by anyone without access or open the camera while students respond to the digital assessment, especially in the final exams.

Field Research Procedures and Results

In achieving its goals, the current research relied on a tool for secondary school teachers and supervisors, the main objective of which is to reveal the effectiveness of digital assessment tools across educational platforms in light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors.

First: A questionnaire to reveal the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards at the secondary stage.

The purpose of the questionnaire:

The current research tried to use this questionnaire to answer the field questions, which states:

1. What are the standards of digital assessment tools across educational platforms in light of the standards of science evaluation in secondary school from the point of view of experts and specialists?

2. What is the effectiveness of digital achievement files across educational platforms in light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors?

3. What is the effectiveness of digital achievement tests across educational platforms in light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors?

4. To what extent are the responses of the research sample of science teachers and supervisors different towards the effectiveness of digital assessment tools across educational platforms in light of science evaluation standards at the secondary stage in light of the variables (job, gender, specialization, years of experience)?

In order to answer the previous questions about the effectiveness of digital assessment tools across educational platforms in light of the science evaluation standards at the secondary stage, the following was done:

The results of the first question:

The first question states: What are the standards of digital assessment tools across educational platforms in light of science evaluation standards at the secondary stage from the point of view of experts and specialists?

The list of standards for digital assessment tools was built across educational platforms in light of the standards of science evaluation at the secondary stage from the point of view of experts and specialists; It was converted into a questionnaire in light of the list of criteria, and by taking advantage of the questionnaires in previous studies, including the study of Al Misfer, Al-Shayeb and Faraj (2012), Bani Doumi and Al-Shanaq (2005), Al-Roqi and Al-Turki (2017), Al-Subaie (2017), and the effectiveness of the evaluation tools was reached across digital educational platforms in light of the standards of science evaluation at the secondary stage, consisting of two main topics, and four sub-axes as follows:

The first axis: the effectiveness of digital achievement files.

The second axis: the effectiveness of digital achievement tests.

Level of Response to Questionnaire Statements

The responses of the research sample in the light of the level of availability test included five responses (very large - large - medium - weak - very weak); to clarify the opinions of the research sample about the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards at the secondary stage.

Validity of Questionnaire

After completing the preparation of the initial image of the questionnaire, procedures were taken to legalize it, and to ensure scientific accuracy, and to make the necessary adjustments, the following was calculated:

The Authenticity of the Content or Purport

In determining the validity of the questionnaire, it was based on logical honesty, which means the extent to which the questionnaire represents the objective that it measures. It was taken into account during the preparation of the questionnaire phrases that they represent the goal it measures, which is the effectiveness of digital assessment tools across educational platforms in light of the standards of science evaluation in the secondary stage, it also relied on apparent honesty in determining its sincerity on the development of an initial vision of it, After preparing the initial picture of it, its validity was verified by the arbitrators, from the professors of education and psychology, in order to judge the suitability of the different dimensions and the clarity of the vocabulary and its relevance to the axis to which it belongs. In light of the opinions expressed by the arbitrators, the necessary amendments were made, and the final image of the questionnaire was presented to a group of specialized arbitrators, some phrases were reformulated, others were deleted, and new phrases were added in order for the questionnaire to fit with the nature of the current research and become valid for application.

Internal Consistency

It intends to determine the internal homogeneity of the questionnaire, meaning that each phrase aims to measure the same function measured by the other phrases in the questionnaire, and the internal consistency validity is used to exclude invalid statements in the questionnaire. In order to determine the internal consistency, the correlation coefficients were calculated between each phrase and the total score of the questionnaire. The correlation coefficients showed statistical significance at the level (0.01), and thus the questionnaire had a high degree of internal consistency.

Questionnaire Stability

The stability of the questionnaire means the accuracy of this questionnaire in measurement, observation and not contradicting itself, or that the questionnaire gives the same results if it is used more than once under the same conditions, or similar conditions, and there are different ways to calculate its stability, and the stability was calculated to verify the following:

- The clarity of the questionnaire's instructions.
- - The extent of the integrity and clarity of the wording of its vocabulary.
- The suitability of the questionnaire's vocabulary to the environment and culture of the field and for the purpose for which it was prepared.

The stability of the questionnaire was calculated using the Krum Bach alpha coefficient, using the statistical program (SPSS, V23) by applying the questionnaire to a survey sample consisting of (30) teachers and supervisors. The results are clear from the following table:

Table 1 *Shows Cronbach's alpha stability index for the sub-axes of the resolution*

Cronbach's alpha coefficient	number of paragraphs	Standards	axles
0.865	**20**	**General**	**The first axis: the effectiveness of digital achievement files**
0.782	**10**	**Technical**	
0.832	**20**	**General**	**The second axis: the effectiveness of digital achievement tests**
0.851	**10**	**Technical**	
0.811	**60**	**Total resolution**	

Statistical Processing

The questionnaire data was unloaded using iterative tables for each single, which included the responses (very large - large - medium - weak - very weak) in light of the level of availability criterion, then frequencies, percentage, relative weight and standard deviations were calculated, and the statistical program (SPSS) was used to perform these operations.

Statistical Equations

The responses obtained in aggregate for the sample members were unloaded in tables specially prepared for this purpose, and the following statistical methods were used in data processing:

- Iterative tables: which are used to obtain the percentages of iterations of responses (very large, large, medium, weak, very weak), in front of each of the questionnaire terms to compare them with the total sample members; Where percentages are more expressive than raw numbers.

- Relative weight: It is a numerical estimate on the total sample members; Where the relative weight helps determine the level of availability on each of the questionnaire terms, and the numerical estimate for the statements was calculated by giving a score for each of the five responses according to the Likert method from the responses of the current research sample for the questionnaire. The response (very large) takes the score (5) and the response (large) gets a score (4), response (medium) gets a score of (3), response (weak) gets a score of (2), and response (very weak) gets a score of (1), and the numerical estimate for each statement can be calculated as follows:

$$\frac{\text{very weak repetition x 1 + repetitions weak 2x + medium repetitions x 3 + large repetitions x 4 + very large repetitions x 5}}{\text{total sample members}} \quad \text{Numeric rating for each phrase}$$

The level of availability is determined by the following relationship:

$$\text{is (n) where number of responses the (5) and is equal to} \quad \frac{\text{1 - n}}{\text{n}} = \text{Availability level}$$

$$0.8 = \frac{\text{1 - 5}}{\text{5}} = \text{Availability level}$$

The following table shows the level of availability for each of the five responses in the questionnaire:

Table 2 *Availability level and extent for each of the responses of the current research sample on the questionnaire*

Range	Availability level
4.20 - 5	very large

3.40 – 4.20	large
2.60 – 3.40	medium
1.80 – 2.60	weak
1 – 1.80	Very weak

Research Sample:

The research sample consisted of (115) of two categories:

The first category: science teachers in the secondary stage, and their number is (87) male and female teachers, and the science supervisors in the secondary stage numbered (28) male and female supervisors. The following table shows the numbers according to their different variables. The following table shows the distribution of the sample members according to the academic average variable:

Table 3 *Shows the distribution of the sample members according to the research variables*

The ratio	**the number**	**Category**	**variable**	**Total**	**their number**	**the sample**
41%	**68**	**male**	**Type**	**115**	**87**	**teachers**
59%	**47**	**female**				
36%	**41**	**chemistry**	**Specialization**			
33%	**38**	**physics**			**28**	**Supervisors**
31%	**36**	**alive**				
26%	**30**	**1-5 years**	**Years of Experience**			
32%	**37**	**6-10 years**				
42%	**48**	**11 - and over**				

First: the results of the questionnaire

The following results provide a detailed presentation of the opinions of the research sample from secondary school science teachers and supervisors on the two questions of the questionnaire, in order to answer the previously mentioned field research questions, in order to reveal the effectiveness of digital assessment tools across educational platforms in light of the standards of science evaluation in secondary school, and below are the results in details:

The First Axis: The Effectiveness of Digital Achievement Files in the Assessment across Educational Platforms

The results of the second question (its discussion and interpretation):

The second question states: What is the effectiveness of digital achievement files across educational platforms in light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors?

First: General Standards for Digital Achievement Files

Table 4 *Frequencies, percentages, relative weight, standard deviation, and level of availability associated with the general standards of digital achievement profiles in the assessment across educational platforms*

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
large	0.47	3.89	-	-	2.6	3	9.6	11	84.3	97	3.5	4	The achievement file contains the CV of the student who .owns the file	1
weak	0.66	2.24	5.2	6	72.2	83	15.7	18	7.0	8	-	-	The student designs the home page to indicate his personality and the content of the .file	2
medium	0.94	3.00	7.8	9	13.9	16	54.8	63	17.4	20	6.1	7	There are specific and clear procedural objectives for the portfolio .environment	3
large	1.10	3.63	7.0	8	11.3	13	9.6	11	55.7	64	16.5	19	The assignments in the portfolio environment are derived from the course .objectives	4
large	1.02	3.66	6.1	7	7.0	8	16.5	19	55.7	64	14.8	17	The portfolio environment includes a map of assignments that includes the topics of the course	5

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
large	**0.95**	**3.70**	**5.2**	**6**	**5.2**	**6**	**16.5**	**19**	**60.0**	**69**	**13.0**	**15th**	**The portfolio's tasks vary between answering achievement questions, research questions, and others**	**6**
weak	**0.89**	**2.37**	**9.6**	**11**	**59.1**	**68**	**18.3**	**21**	**10.4**	**12**	**2.6**	**3**	**The achievement file includes a practical aspect based on the processes of science defining the problem, observation, imposing hypotheses, ,conclusion .....**	**7**
large	**1.06**	**3.63**	**6.1**	**7**	**10.4**	**12**	**13.9**	**16**	**53.9**	**62**	**15.7**	**18**	**The forms for answering the tasks are supported with pictures, ..videos, etc**	**8**
medium	**1.04**	**3.11**	**9.6**	**11**	**10.4**	**12**	**48.7**	**56**	**21.7**	**25**	**9.6**	**11**	**The student reduces the sound and visual effects and inappropriate colors with the answers to the tasks in .the file**	**9**

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
large	0.98	3.70	4.3	5	7.8	9	18.3	21	53.0	61	16.5	19	In group sessions, the teacher discusses the pros and cons of the students' .answers	10
weak	0.84	2.34	8.7	10	61.7	71	18.3	21	9.6	11	1.7	2	The teacher sends individual directions to each student based on the assignments sent from .them	11
medium	1.12	3.17	10.4	12	11.3	13	41.7	48	24.3	28	12.2	14	There are specific criteria for publicly evaluating students' work within the portfolio .environment	12
large	0.96	3.67	4.3	5	7.0	8	20.9	24	53.0	61	14.8	17	Works are evaluated by science teachers and supervisors to ensure the validity of the .evaluation	13
medium	1.06	3.16	8.7	10	12.2	14	44.3	51	24.3	28	10.4	12	The teacher provides feedback to the students based on the work submitted by .them	14

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
large	0.91	3.68	4.3	5	5.2	6	20.9	24	57.4	66	12.2	14	The grades of the year's work are distributed in a equitable manner to the tasks of the achievement .file	15
large	0.87	3.73	3.5	4	5.2	6	18.3	21	60.9	70	12.2	14	Specific criteria are set for the specifications for answering the tasks of the completion file (topic elements, number of lines, type of font, ...)	16
large	0.93	3.65	5.2	6	4.3	5	21.7	25	57.4	66	11.3	13	The teacher sets a timetable for handing in the assignments file	17
large	0.83	3.65	4.3	5	6.1	7	13.0	15th	73.0	84	3.5	4	The achievement file shows the experiences, tasks, activities, and participations that the student has .undertaken	18
large	0.60	3.78	-	-	6.1	7	13.0	15th	77.4	89	3.5	4	The portfolio contributes to	19

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
													highlighting the student's creative .abilities	
large	**0.79**	**3.71**	**5.2**	**6**	**1.7**	**2**	**13.0**	**15th**	**76.5**	**88**	**3.5**	**4**	**The portfolio reflects each student's strengths and .weaknesses**	**20**
medium	**7.80**	**3.37**	**6%**	**133**	**16%**	**369**	**22%**	**514**	**47%**	**1073**	**9%**	**211**	**Total**	

Looking at the detailed statistical data for the opinions of the research sample from secondary school science teachers and supervisors on the effectiveness of the general standards of digital achievement files in the evaluation across educational platforms, the following becomes clear:

- The focus of the general standards for digital achievement files in evaluating science at the secondary level came at an “average” level with a relative weight of (3.37), which is an average indicator of the effectiveness of digital achievement files in evaluating science across educational platforms from the point of view of science teachers and supervisors at the secondary level.

- Most of the overall criteria for digital achievement files were at a “large” level, which is considered to be a high level of effectiveness; Where their relative weights ranged between (3.89) to (3.63), and these criteria are: (The achievement file contains the curriculum vitae of the student with the file), the educational tasks in the achievement file environment are derived from the course objectives, the achievement file environment includes a comprehensive assignment map of all subjects of the course. The assignments of the achievement file vary between answering achievement and research questions, forms for answering assignments are supported with pictures and videos. the teacher discusses in group sessions the pros and cons of students’ answers, the works are evaluated by science teachers and supervisors to ensure the validity of the assessment, the grades of the year’s work are distributed in a fair manner on the tasks of the achievement file. specific criteria are set for the specifications for answering the tasks of the achievement file. The teacher sets a timetable for handing over the tasks of the achievement file. The achievement file shows the experiences, tasks, activities and participations made by the student. The achievement file contributes to highlighting the student’s creative abilities. The achievement file reflects the strengths and weaknesses for each student. This could be due to the fact that they are the basics by which the owner of the achievement file is identified, as well as the foundations for its construction and follow-up by teachers.

- Four general criteria for digital achievement files came at a "medium" level, which is considered medium effectiveness; Where their relative weights ranged between (3.17) to (3.00), and these criteria are represented in: (Procedural objectives are available for the environment of the achievement file in a specific and clear way, the student reduces the sound and visual effects and inappropriate colors with the answers to the tasks in the file, there are specific criteria for publicly evaluating students’ work within the achievement file environment, the teacher provides feedback to students based on the work submitted by them); The weak provision of the

objectives of the procedural environment and the determinants of colors in the environment, and the weakness of follow-up and providing feedback can be attributed to the large burden of teachers.

- Three general criteria for digital achievement files came at a "weak" level, which is considered weak effectiveness; Where their relative weights ranged between (2.37) to (2.24), and these criteria are: (The student designs the home page to indicate his personality and the content of the file. The achievement file includes a practical aspect based on science processes (problem identification, observation, hypothesis, and conclusion), the teacher sends individual instructions to each student based on the tasks sent from him; This could be due to the poor availability of the platform for the student to design his/her page and the lack of capabilities in it.

Second: Technical Standards for Digital Achievement Files

Table 5 *Frequencies, percentages, relative weight, standard deviation, and level of availability associated with technical standards for digital achievement profiles in the assessment across educational platforms*

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
large	0.88	3.68	6.1	7	3.5	4	13.0	15th	71.3	82	6.1	7	Each student's achievement file is accessed with a name .and password	21
large	0.91	3.60	7.0	8	4.3	5	13.9	16	71.3	82	3.5	4	A digital environment for the portfolio is simple and .straightforward	22
large	0.83	3.66	5.2	6	3.5	4	14.8	17	73.0	84	3.5	4	The portfolio environment is interactive and .engaging	23
large	0.89	3.66	7.0	8	1.7	2	14.8	17	71.3	82	5.2	6	The portfolio environment allows feedback from teacher .to students	24
medium	1.08	3.13	9.6	11	13.0	15th	42.6	49	24.3	28	10.4	12	The portfolio environment includes various interaction modes (forums) for discussion, comment .and feedback	25
weak	0.66	2.26	5.2	6	70.4	81	17.4	20	7.0	8	-	-	Availability of creating collaborative discussion groups for students in the .portfolio environment	26
medium	1.05	3.19	7.8	9	13.0	15th	41.7	48	27.0	31	10.4	12	the Achievement File Environment supports standard formats of	27

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
													multimedia files (DOC, PDF, MP3, MPG)	
weak	**0.74**	**2.31**	**5.2**	**6**	**69.6**	**80**	**13.9**	**16**	**11.3**	**13**	**-**	**-**	**Availability of an appropriate space in the achievement file environment to upload the student's .work to**	**28**
weak	**0.73**	**2.33**	**5.2**	**6**	**67.0**	**77**	**17.4**	**20**	**10.4**	**12**	**-**	**-**	**The learner's control over the update of his personal data on his .achievement file**	**29**
large	**0.88**	**3.61**	**7.0**	**8**	**1.7**	**2**	**18.3**	**21**	**69.6**	**80**	**3.5**	**4**	**Availability of channels through which the teacher informs the students of the task grades .periodically**	**30**
medium	4.81	3.14	**7%**	**75**	**25%**	**285**	**21%**	**239**	**44%**	**502**	**4%**	**49**	**Total**	

Looking at the detailed statistical data for the opinions of the research sample from secondary school science teachers and supervisors on the effectiveness of the technical standards for digital achievement files in the assessment across educational platforms, the following becomes clear:

- The focus of the technical standards for digital achievement files in evaluating science at the secondary level came at an "average" level with a relative weight of (3.14), which is an average indicator of the effectiveness of digital achievement files in evaluating science across educational platforms from the point of view of science teachers and supervisors at the secondary level.

- Most of the technical standards for digital achievement files were at a "large" level, which is considered to be highly effective; Where their relative weights ranged between (3.68) to (3.60), and these criteria are represented in: (The achievement file for each student is entered with a name and password, the digital environment for the achievement file is characterized as simple and clear, the achievement file environment is characterized as interactive and participation, the achievement file environment allows feedback from the teacher to the students. Availability of channels through which the teacher is informed of the grades of the assignments periodically); This can be due to the technical fundamentals and degrees of protection of user rights and data confidentiality, and providing appropriate means of contact and communication.

- Two of the general criteria for digital achievement file came at the "medium" level, which is considered to be medium effectiveness; Where their relative weights ranged between (3.19) to (3.13), and these criteria are: (The achievement file environment includes various interaction patterns (forums) for discussion, comment and opinion. The achievement file environment supports standard formats of multimedia files (DOC, PDF, MP3, MPG); This could be due to the limited capabilities in the educational platform environment.

- Three general criteria for digital achievement files came at a "weak" level, which is considered weak effectiveness; where their relative weights ranged between (2.33) to (2.26), and these criteria are represented in: (the availability of the

possibility of creating collaborative discussion groups for students in the achievement file environment, the availability of an appropriate space in the achievement file environment to upload the student's work on it, the learner's control to update their personal information on their own achievement file); This could be due to the restriction of some of the capabilities available so as not to clutter the platform and make it a mechanism for public communication and storage.

By analyzing the opinions of the current research sample of secondary school science teachers and supervisors on the effectiveness of digital achievement files across educational platforms in light of the science evaluation standards in the secondary stage, it becomes clear that:

The degree of effectiveness in terms of availability and use of general and technical standards for digital achievement files in science evaluation at the secondary stage "Medium." The general criteria for the effectiveness of the achievement file came first with a relative weight of (3.37), which is considered close to the degree of high effectiveness, whose relative weight is (3.40) or more, followed by the technical standards with a relative weight of (3.14); These results are in agreement with many studies such as the study of Al-Mohammadi (2013), whose results confirmed the effectiveness of achievement files in evaluating the learning of concepts in biology, and the study of Al-Misfer, Al-Shayeb and Faraj (2012) on the effectiveness of using achievement files in evaluating students' achievement in chemistry, as well as with the study of Lirola and Rubio (2009), the results of which confirmed the importance of using the achievement files in the evaluation, and also agreed with the study of Al-Massad (2012), which emphasizes the effectiveness of the achievement files, and with the presence of some obstacles in the student's design of the home page him/herself, and the inclusion of the file on a practical aspect based on the processes of science, and the control of the learner in updating their personal life.

The Second Axis: The Effectiveness of Digital Achievement Files in the Final Evaluation across Educational Platforms

The results of the third question (its discussion and interpretation):

The third question states: What is the effectiveness of achievement tests across educational platforms in light of science evaluation standards at the secondary stage from the point of view of science teachers and supervisors?

Third: General Standards for Achievement Tests

Table 6 *Frequencies, percentages, relative weight, standard deviation, and level of availability associated with general standards for achievement tests in assessment across educational platforms.*

Availability level	**standard deviation**	**relative weight**	**Availability level**										Phrase	NS
			Very weak		**weak**		**medium**		**large**		**very large**			
			%	**NS**	**%**	**NS**	**%**	**NS**	**%**	**NS**	**%**	**NS**		
large	**0.56**	**3.92**	**-**	**-**	**2.6**	**3**	**12.2**	**14**	**75.7**	**87**	**9.6**	**11**	**The test is appropriate for the educational stage prepared for it.**	**31**
large	**0.70**	**3.76**	**2.6**	**3**	**3.5**	**4**	**13.0**	**15th**	**77.4**	**89**	**3.5**	**4**	**The test is comprehensive to achieve the behavioral objectives of the course.**	**32**
large	**0.70**	**3.65**	**1.7**	**2**	**5.2**	**6**	**21.7**	**25**	**68.7**	**79**	**2.6**	**3**	**The test questions vary between essay and objective.**	**33**

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
large	0.47	3.89	-	-	2.6	3	9.6	11	84.3	97	3.5	4	The test questions are considered appropriate to the nature of the course.	34
weak	0.79	2.30	11.3	13	57.4	66	21.7	25	9.6	11	-	-	A mechanism is put in place to avoid cheating during the test.	35
large	0.47	3.89	-	-	2.6	3	9.6	11	84.3	97	3.5	4	Be careful to avoid the use of negation in formulating test questions.	36
large	0.78	3.71	4.3	5	2.6	3	14.8	17	73.9	85	4.3	5	Exam instructions are clearly laid out (number of questions, time, how to answer).	37
large	0.89	3.60	6.1	7	5.2	6	14.8	17	70.4	81	3.5	4	A mechanism is developed for the evaluation of the test, indicating the score of each paragraph.	38
large	0.56	3,83	-	-	2.6	3	17.4	20	73.9	85	6.1	7	The grades are distributed equitably between the subjects of the course.	39
large	0.52	3.92	-	-	2.6	3	9.6	11	80.9	93	7.0	8	The test questions are proportional in number and degree of difficulty to the time of the test.	40
large	0.51	3.84	-	-	2.6	3	13.9	16	80.0	92	3.5	4	The wording of the test questions is linguistically and scientifically sound.	41
large	0.59	3.84	-	-	4.3	5	13.0	15th	76.5	88	6.1	7	The test questions vary in terms of ease and difficulty.	42
large	0.64	3.83	-	-	7.0	8	9.6	11	77.4	89	6.1	7	An example is placed at the beginning of the test showing how to answer the test questions.	43
medium	1.10	3.34	7.8	9	10.4	12	36.5	42	30.4	35	14.8	17	The test questions vary to include Bloom's Modified Levels (Remember, Understand, Apply Analysis, Evaluation, Creativity).	44

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
large	0.96	3.55	7.8	9	6.1	7	13.0	15th	69.6	80	3.5	4	The questions are selected objectively to measure the true level of the students.	45
large	0.47	3.89	-	-	2.6	3	9.6	11	84.3	97	3.5	4	There is only one correct answer for each essay or genre question.	46
large	0.55	3.77	-	-	2.6	3	21.7	25	72.2	83	3.5	4	Set clear criteria for answering essay questions (number of lines, clarity of idea)	47
large	0.47	3.89	-	-	2.6	3	9.6	11	84.3	97	3.5	4	Consider starting the questions with verbs that provoke students' thinking.	48
large	0.54	3.87	-	-	2.6	3	13.9	16	77.4	89	6.1	7	Avoid formulating questions that arouse the subjectiveness of the corrector (summarize, speak briefly).	49
large	0.63	3.90	0.9	1	1.7	2	14.8	17	72.2	83	10.4	12	Grouping the questions of each type with each other (completion, true and false, multiple choice).	50
large	8.53	3.71	2%	49	6%	149	15th%	345	71%	1637	5%	120	Total	

Looking at the detailed statistical data for the opinions of the research sample from secondary school science teachers and supervisors on the effectiveness of the general standards for digital achievement tests in the end-of-year assessment across educational platforms, the following is evident:

- The focus of the general standards for digital achievement tests in evaluating science at the secondary level came at a “large” level and with a relative weight of (3.71), which is a high indicator of the effectiveness of digital achievement tests in evaluating science across educational platforms from the point of view of science teachers and supervisors at the secondary level.

- Most of the general standards for digital achievement tests came at a "large" level, which is considered to be highly effective; Where their relative weights ranged between (3.92) to (3.55), and these criteria are represented in: (The test is proportional to the educational stage for which it is prepared. The test is characterized by comprehensiveness to achieve the behavioral objectives of the course. The test questions vary between essay and objective. The test questions take into account their relevance to the nature of the course, taking into account the use of negation in the formulation of the test questions, the instructions of the test are clearly laid out (number of questions, time, how to answer). A mechanism for evaluating the test is established in which the degree of each paragraph is indicated, the degrees are distributed fairly

among the subjects of the course. The test questions are proportional to the number and degree of difficulty with the test time. The formulation of the test questions is linguistically and scientifically sound. The test questions vary in terms of ease and difficulty. An example is placed at the beginning of the test that shows how to answer the test questions. Questions are selected objectively to measure the real level of students, there is one correct answer for each essay or qualitative question, clear criteria are set for answering essay questions (number of lines, clarity of idea), taking into account starting questions with actions that provoke students' thinking, avoiding the formulation of questions that provoke self-corrector (Summarize, speak briefly), group the questions of each type together (completion, true and false, multiple choice); This could be due to the fact that they are very necessary criteria for the final digital achievement test questions in terms of their proportion to the stage, degree of difficulty, ease, diversity, and comprehensiveness.

- One of the general criteria for digital achievement tests came at an "average" level, which is considered medium effectiveness; with a relative weight of (3.34), and these criteria are: (The test questions vary to include Bloom's modified levels of "remembering, understanding, applying analysis, evaluation, creativity"); This could be due to the weak capabilities available on the platform to include a virtual lab, images and videos, graphic analysis and simulation.

- One of the general criteria for digital achievement tests came at a "weak" level, which is considered a weak efficacy; With a relative weight of (2.30), these criteria are: (a mechanism is set to avoid cheating during the test); Weakness may be due to the fact that the tests are applied remotely, and the difficulty in controlling them.

Fourth: Technical Standards for Achievement Tests

Table 7 Frequencies, percentages, relative weight, standard deviation, and level of availability associated with technical standards for achievement tests in assessment across educational platforms

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
large	**0.727**	**3.88**	**1.7**	**2**	**2.6**	**3**	**14.8**	**17**	**67.8**	**78**	**13.0**	**15th**	**It is easy to run the test on more than one browser on the Internet Chrome,) (Firefox,**	**51**
weak	**0.852**	**2.49**	**5.2**	**6**	**58.3**	**67**	**20.0**	**23**	**15.7**	**18**	**0.9**	**1**	**Running the test requires a low speed internet**	**52**
large	**0.695**	**3.99**	**0.9**	**1**	**1.7**	**2**	**13.9**	**16**	**64.3**	**74**	**19.1**	**22**	**It is easy to access the test through the name and password of .each student**	**53**
large	**0.688**	**4.00**	**0.9**	**1**	**1.7**	**2**	**13.0**	**15th**	**65.2**	**75**	**19.1**	**22**	**The student navigates the test with ease**	**54**
large	**0.814**	**3.89**	**2.6**	**3**	**3.5**	**4**	**13.0**	**15th**	**64.3**	**74**	**16.5**	**19**	**The learner is allowed to exit**	**55**

Availability level	standard deviation	relative weight	Availability level										Phrase	NS
			Very weak		weak		medium		large		very large			
			%	NS	%	NS	%	NS	%	NS	%	NS		
													the test at any moment	
large	**0.707**	**4.03**	**0.9**	**1**	**2.6**	**3**	**10.4**	**12**	**65.2**	**75**	**20.9**	**24**	**The test allows the content of the educational material to be printed**	**56**
large	**0.715**	**4.12**	**0.9**	**1**	**0.9**	**1**	**12.2**	**14**	**57.4**	**66**	**28.7**	**33**	**Organizing the test questions in one form in all screens**	**57**
weak	**0.820**	**2.54**	**5.2**	**6**	**50.4**	**58**	**30.4**	**35**	**13.0**	**15th**	**0.9**	**1**	**An icon is placed through which support is requested during the test**	**58**
large	**1.124**	**3.42**	**7.8**	**9**	**8.7**	**10**	**35.7**	**41**	**29.6**	**34**	**18.3**	**21**	**The test environment supports standard formats of multimedia DOC,) files PDF, MP3, (MPG,**	**59**
large	**0.606**	**4.03**	**-**	**-**	**0.9**	**1**	**13.9**	**16**	**66.1**	**76**	**19.1**	**22**	**The test result appears as soon as finishing answering all questions**	**60**
large	**4.491**	**3.64**	**3%**	**30**	**13%**	**151**	**18%**	**204**	**51%**	**585**	**16%**	**180**	**Total**	

Looking at the detailed statistical data for the opinions of the research sample from secondary school science teachers and supervisors on the effectiveness of the general standards for digital achievement tests in the end-of-year assessment across educational platforms, the following is evident:

- The focus of the technical standards for digital achievement tests in evaluating science at the secondary level came at a “large” level and with a relative weight of (3.64), which is a high indicator of the effectiveness of digital achievement tests in evaluating science across educational platforms from the point of view of science teachers and supervisors at the secondary level.

- Most of the technical standards for digital achievement tests came at a "large" level, which is considered to be highly effective; Where their relative weights ranged between (4.12) to (3.42), and these criteria are: (It is easy to access the test through a name and password for each student, the student roams inside the test with simplicity and ease, the learner is allowed to exit the test at any moment, The test allows printing the content of the educational material, organizing the test questions in one form on all screens, the test environment supports standard formats of

multimedia files (DOC, PDF, MP3, MPG), the test result appears immediately after the completion of the answer to its questions); This can be due to ensuring that the student enters and exits by himself to the test page, supporting the test with multiple file formats for the diversity of questions, and instilling reassurance in the hearts of students through the immediate announcement of the result.

- Two of the technical standards for digital achievement tests came at a "weak" level, which is considered to be a weak efficacy; Where their relative weights ranged between (2.54) to (2.49), and these criteria are: (running the test requires a low-speed internet, an icon is placed through which support is requested during the test); This could be due to the possibilities available through the testing platform, and the poor availability of support because teachers are preoccupied with other burdens related to the educational process.

By analyzing the opinions of the current research sample of secondary school science teachers and supervisors on the effectiveness of digital achievement tests across educational platforms in light of the science evaluation standards at the secondary stage, it is clear that: The degree of effectiveness in terms of availability and use of general and technical standards for achievement tests in science evaluation in secondary school is "high." The general criteria for the effectiveness of the achievement file came first with a relative weight (3.71), followed by the technical standards with a relative weight (3.64); These results are in agreement with several studies, such as Al- Ibri study (2017), the results of which confirmed the effectiveness of electronic tests in evaluating science achievement and reducing test anxiety, as well as with the study of Jordan and Mitchell (2009), whose results confirmed the effectiveness of electronic tests in evaluating students by providing some assistance, and differed with the study of Al-Roqi (2017). On the weakness of science teachers' practice of electronic tests in evaluating science, as Mandour's study (2013) agreed with the study of Bani Doumi (2005), which emphasizes the effectiveness of electronic tests in evaluating student education, and with the presence of some obstacles in the difficulty of diversifying test questions to include higher cognitive levels, The difficulty of controlling cheating during the test, and the frequent interruption of the Internet during the test, with the lack of technical support for that.

The results of the fourth question, It's discussion and interpretation:

The fourth question states: How different are the responses of the research sample from science teachers and supervisors towards the effectiveness of digital assessment tools across educational platforms in light of science evaluation standards at the secondary stage in light of the variables (job, gender, specialization, years of experience)?

a) Job Variable:

To find out the extent of differences between the research sample about the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards at the secondary stage due to the job variable. To answer the question, the t-test value of the differences between the mean scores of the research sample was calculated, and the following is a summary of the results:

Table 8 *The results of the value of "t" and the level of statistical significance to clarify the differences between the research sample according to the variable (job) on the identification of the effectiveness of digital assessment tools across educational platforms in the light of science assessment standards in the secondary stage*

Significance level (0.05)	NS	degrees of freedom	average differences	standard error	standard deviation	average	the number	job	Standards	axles
0.898	**0.128**	**113**	**0.218**	**0.796**	**7.422**	**67.43**	**87**	**Teacher**	**General**	**achievement files**
Not statistically significant				**1.702**	**9.07**	**67.64**	**28**	**Supervisor**		
0.817	**0.233**	**113**	**0.244**	**0.504**	**4.702**	**31.49**	**87**	**Teacher**	**Technical**	
Not statistically significant				**0.989**	**5.233**	**31.25**	**28**	**Supervisor**		
0.745	**0.326**	**113**	**0.608**	**0.892**	**8.324**	**74.32**	**87**	**Teacher**	**General**	**Achievement tests**
Not statistically significant				**1.755**	**9.289**	**73.71**	**28**	**Supervisor**		
0.421	**0.807**	**113**	**0.789**	**0.466**	**4.345**	**36.57**	**87**	**Teacher**	**Technical**	
Not statistically significant				**0.936**	**4.954**	**35.79**	**28**	**Supervisor**		
0.752	**0.317**	**113**	**1.423**	**2.108**	**19,660**	**209.82**	**87**	**Teacher**	**resolution**	
Not statistically significant				**4,437**	**23.479**	**208.39**	**28**	**Supervisor**		

By extrapolating the data of the previous table, it becomes clear that there are no statistically significant differences between the average responses of the research sample about the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards at the secondary stage due to the job variable; Where the value of (t) calculated for the questionnaire as a whole was (0.317), and for the axes: criteria (general and technical for the achievement file, general and technical for achievement tests) which are (0.128, 0.233, 0.326, 0.807), respectively, and they are not statistically significant values at the level (0.05) because they are less than the tabular value (2.09), which indicates That there are no differences between the teacher and the supervisor, and this could be due to those who work in the secondary stage of science supervisors teachers who have the advanced technology capabilities to use tools in the use and management of digital assessment tools across educational platforms, in addition to the supervision that should be on a higher level than supervised.

b) Gender Variable:

And to find out the extent of differences between the research sample about the effectiveness of digital assessment tools across educational platforms in light of the standards of science evaluation at the secondary stage due to the gender variable; To answer the question, the t-test value of the differences between the mean scores of the research sample was calculated, and the following is a summary of the results:

Table 9 *The results of the value of "t" and the level of statistical significance to clarify the differences between the research sample according to the variable (Gender) on the identification of the effectiveness of digital assessment tools across educational platforms in the light of science assessment standards in the secondary stage*

Significance level (0.05)	NS	degrees of freedom	average differences	standard error	standard deviation	average	the number	Gender	Standards	**axles**
0.522	**0.643**	**113**	**0.953**	**0.943**	**7.777**	**67.87**	**68**	**male**	**General**	**achievement files**
Not statistically significant				**1.148**	**7.874**	**66.91**	**47**	**female**		
0.771	**0.292**	**113**	**0.268**	**0.605**	**4.985**	**31.54**	**68**	**male**	**Technical**	
Not statistically significant				**0.672**	**4.605**	**31.28**	**47**	**female**		
0.771	**0.292**	**113**	**0.474**	**1.088**	**8.972**	**74.37**	**68**	**male**	**General**	**Achievement tests**
Not statistically significant				**1.157**	**7.935**	**73.89**	**47**	**female**		
0.355	**0.928**	**113**	**0.791**	**0.542**	**4.469**	**36.71**	**68**	**male**	**Technical**	
Not statistically significant				**0.661**	**4.529**	**35.91**	**47**	**female**		
0.526	**0.636**	**113**	**2.485**	**2.542**	**20.962**	**210.49**	**68**	**male**	**resolution**	
Not statistically significant				**2.930**	**20.085**	**208.00**	**47**	**female**		

By extrapolating the data of the previous table, it becomes clear that there are no statistically significant differences between the average responses of the research sample about the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards at the secondary stage due to the gender variable; Where the value of (t) calculated for the questionnaire as a whole was (0.636), and for the axes: criteria (general and technical for the achievement file, general and technical for achievement tests) which are (0.643, 0.292, 0.292, 0.928), respectively, which are non-statistically significant values at the level (0, 05) because it is less than the tabular value (2,09), which indicates that there are no differences between males and females. This could be due to the fact that the use of technology in evaluating students has become a necessary requirement for education, and is no longer limited to the distinguished of both genders. It is a requirement for the learning era in the time of epidemics.

c) Specialization Variable:

And to find out the extent of differences between the research sample about the effectiveness of digital assessment tools across educational platforms in the light of the standards of science evaluation at the secondary stage due to specialization; To answer the question, a one-way analysis of variance was used. The results are shown in the following table:

Table 10 *Averages and standard deviations between the research sample according to the variable (specialization) on the identification of the effectiveness of digital assessment tools across educational platforms in the light of science assessment standards in the secondary stage*

Standard Error	standard deviation	Average	Number	Specialization	Standards	Axles
1.237	7.918	68.37	41	chemistry	General	Achievement Files
1.210	7.460	67.03	38	physics		
1.355	8.127	66.94	36	biology		
0.727	7.796	67.48	115	total		
0.809	5.182	31.46	41	chemistry	Technical	
0.697	4.299	31.82	38	physics		
0.832	4.991	31.00	36	biology		
0.449	4.814	31.43	115	total		
1.350	8.641	74.93	41	chemistry	General	Achievement Tests
1.320	8.137	74.11	38	physics		
1.495	8.967	73.39	36	biology		
0.796	8.531	74.17	115	total		
0.764	4.890	37.12	41	chemistry	Technical	
0.584	3.597	36.37	38	physics		
0.805	4.831	35.56	36	biology		
0.419	4.491	36.38	115	total		
3.355	21.482	211.88	41	chemistry	Resolution	
2.897	17.855	209.32	38	physics		
3.720	22.319	206.89	36	biology		
1.917	20.556	209.47	115	total		

It is clear from the data of the previous table that the differences between the averages of the research sample according to the variable (specialization) on the identification of the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards in secondary school are close, which may indicate that there are no statistically significant differences, and to ensure that these differences are not statistically significant at level (0.05) the value of (P) was calculated between those groups as follows:

Table 11 *The results of the analysis of variance to clarify the differences between the research sample according to the variable (specialization) on the identification of the effectiveness of digital assessment tools across educational platforms in the light of science assessment standards in the secondary stage*

Statistical significance	value (P)	mean squares (variance)	degrees of freedom	sum of squares	Contrast source	Standards	axles
0.665	0.410	25.160	2	50.321	between groups	General	achievement files
Not statistically significant		61.414	112	6878.375	within groups		
			114	6928,696	Total		
0.769	0.263	6.178	2	12,355	between groups	Technical	
Not statistically significant		23,481	112	2629,906	within groups		
			114	2642,261	Total		
0.734	0.310	22,803	2	45,607	between groups	General	Achievement tests
Not statistically significant		73,669	112	8250.915	within groups		
			114	8296.522	Total		
0.314	1.170	23.522	2	47.044	between groups	Technical	
Not statistically significant		20.108	112	2252.121	within groups		
			114	2299.165	Total		
572.0	0.562	239,244	2	478,487	between groups	resolution	
Not statistically significant		425.805	112	47690.156	within groups		
			114	48168.643	Total		

Looking at the value of (P) in the previous table, it was found that it is not statistically significant at the level (0.05); The questionnaire as a whole reached (0.562), and for the axes (0.583, 0.147, 0.626, 0.072, 0.012) Digital evaluation tools across educational platforms in the light of science evaluation standards in the secondary stage, respectively, criteria (general and technical for achievement file, general and technical for achievement tests) and each of them is less than the value of the tabular (P) value of (2.02) for the four axes, and accordingly there are no significant differences Statistically, which indicates that the variable of

specialization has no effect on the current research, and this could be due to the fact that the various branches of science, including chemistry, physics and biology, contain similar educational material in general content between theory, process and application.

d) Years of Experience Variable:

And to find out the extent of differences between the research sample about the effectiveness of digital assessment tools across educational platforms in light of the standards of science evaluation at the secondary stage due to years of experience; To answer the question, a one-way analysis of variance was used. The results are shown in the following table:

Table 12 *Averages and standard deviations between the research sample according to the variable (years of experience) to identify the effectiveness of digital assessment tools across educational platforms in the light of science assessment standards in the secondary stage*

standard error	standard deviation	average	the number	Years of Experience	Standards	Axles
1.498	8.203	68.40	30	1-5 Years	General	Achievement files
1.247	7.587	67.35	37	6-10 Years		
1.128	7.812	67.00	48	11- and over		
0.727	7.796	67.48	115	Total		
0.967	5.296	31.50	30	1-5 Years	Technical	
0.798	4.857	31.54	37	6-10 Years		
0.659	4.562	31.31	48	11- and over		
0.449	4.814	31.43	115	Total		
1.658	9.082	74.00	30	1-5 Years	General	Achievement tests
1.499	9.116	74.70	37	6-10 Years		
1.133	7.851	73.88	48	11- and over		
0.796	8,531	74.17	115	Total		
0.893	4.891	36.93	30	1-5 Years	Technical	
0.693	4.214	36.49	37	6-10 Years		
0.648	4.491	35.96	48	11- and over		
0.419	4.491	36.38	115	Total		
4.357	23,862	210.83	30	1-5 Years	resolution	
3.112	18.929	210.08	37	6-10 Years		
2.872	19,895	208.15	48	11-15 Years		
1.917	20,556	209.47	115	Total		

It is clear from the data of the previous table that the differences between the averages of the research sample according to the variable (years of experience) on the identification of the effectiveness of digital assessment tools across educational platforms in light of the standards of science evaluation in secondary school are close, which may indicate that there are no statistically significant differences, and to ensure that these differences Not statistically significant at the level (0.05), the value of (P) was calculated between those groups as follows:

Table 13 *The results of the analysis of variance to clarify the differences between the research sample according to the variable (years of experience) on the identification of the effectiveness of digital*

assessment tools across educational platforms in the light of science assessment standards in the secondary stage

Statistical significance	value (P)	mean squares (variance)	degrees of freedom	sum of squares	Contrast source	Standards	axles
0.741	301.0	18,532	2	37.063	between groups	General	achievement files
Not statistically significant		61.532	112	6891.632	within groups		
			114	6928,696	Total		
0.974	027.0	0.630	2	1.259	between groups	Technical	
Not statistically significant		23,580	112	2641.002	within groups		
			114	2642,261	Total		
0.900	0.0105	7.771	2	15,542	between groups	General	Achievement tests
Not statistically significant		73.937	112	8280,980	within groups		
			114	8296.522	Total		
0.642	445.0	9.069	2	18.139	between groups	Technical	
Not statistically significant		20,366	112	2281.027	within groups		
			114	2299.165	Total		
836.0	179.0	76.870	2	153.741	between groups	resolution	
Not statistically significant		428,704	112	48014.903	within groups		
			114	48168.643	Total		

Looking at the value of (P) in the previous table, it was found that it is not statistically significant at the level (0.05); Where the questionnaire as a whole reached (0.179), and for the axes (0.301, 0.027, 0.105, 0.445) for the axes of digital evaluation tools across educational platforms in light of the standards of science evaluation in the secondary stage, respectively, criteria (general and technical for achievement file, general and technical for achievement tests) and each of them is less from the tabular value of (P), which is valued at (2.02) for the four axes, and accordingly there are no statistically significant differences, which indicates that the variable

years of experience has no effect on the current research, and this can be due to the fact that science teachers and supervisors in secondary school have scientific and technological skills which qualifies them to deal well with digital assessment tools because they are among the basics of preparation in universities, whether they are newly appointed or they are experienced for several years.

And by analyzing the opinions of the current research sample of secondary school science teachers and supervisors about the variables affecting the effectiveness of digital assessment tools across educational platforms in the light of science evaluation standards at the secondary stage in light of the variables (job, gender, specialization, years of experience), it is clear that there are no statistically significant differences attributable to the research variables: job (teacher, supervisor), gender (males, females), specialization (chemistry, physics, biology), years of experience (1-5, 6-10, 11-and over); Where (T, P) recorded non-statistically significant values, which are, respectively (0.317, 0.636, 0.562, 0.179), and this is in agreement with the study of Al-Khibri and Al-Ahmad (2016), and the study of Al-Massad (2012), whose results indicated weak differences due to the variable The difference in the type or function of the sample, whether a teacher or supervisor, males or females.

Research Recommendations:

In light of the results of the research, a set of recommendations can be proposed through which to overcome the obstacles facing science teachers and supervisors in the secondary stage while using the digital assessment tools (achievement files - achievement tests) for science in the educational platforms used in distance education in the secondary stage, including recommendations for those in charge of the educational process, one for teachers and supervisors of science, and one for students at the secondary level, and we summarize them as follows:

Those in charge of the educational process (who are responsible for digital platforms), and it requires them to develop digital assessment tools in educational platforms in distance education in some aspects, including:

- Modifying the environment of the achievement file to include various modes of interaction (forums) for discussion and opinion.

- Allowing the creation of collaborative discussion groups for students in the digital achievement file environment.

- Achievement file environment supports standard formats of multimedia files (DOC, PDF, MP3, MPG)

- Availability of an appropriate space in the achievement file environment to upload the student's work on, and the learner's control over updating their personal data on their achievement file.

- Adjusting the platform so that the digital test works on a low-speed Internet.

- Establishing a mechanism through which support can be provided to students, such as an icon through which support is requested during the exam.

- Establishing a mechanism to avoid cheating during the digital test, including opening the camera on the platform during the exam to ensure that the examinee is entered only.

- Take into account the simplicity and complementarity of the presentation of digital test questions on the platform.

- Securing digital platforms with high-quality programs to protect them from hacking and electronic piracy.

- Provide training courses for teachers and supervisors on how to manage the digital assessment across the platform.

- Training students on how to effectively handle and respond to digital assessment tools.

- Generalizing the use of digital platforms for distance education in private schools in Kuwait.

Secondary school science teachers and supervisors, who are required to:

- Providing specific and clear procedural objectives for the achievement file environment and posting them on the platform.

- Setting specific criteria for publicly evaluating students' work within the achievement file environment.

- Providing feedback to students based on the work submitted by them in the achievement file.

- Providing a practical aspect for evaluating science processes, including problem identification, observation, ...

- Sending individual instructions to each student based on the evaluation of their submitted works in the achievement file.

- Diversification of digital test questions to include Bloom's modified levels of: remembering, understanding, applying analysis, evaluation, creativity

- Raising the level of their electronic skills by searching for everything new in science evaluation programs at the secondary level.

- Organizing periodic meetings with students to train them on how to interact with digital assessment tools in science at the secondary level, and to overcome the problems they face during the exam via the platform.

The students, and it is required from them to:

- Adhere to the rules and laws of the digital assessment in the educational platform and not give anyone the password to enter the platform.

- Commitment to the deadlines for the delivery of the tasks of the achievement file, and the dates of the final exams on the platform.

- Permanent correspondence with the teacher about the obstacles and problems you face while sending the work and assignments of the achievement file, and taking the tests via the digital platform.

- Reducing the sound and visual effects and inappropriate colors in the answers to the tasks in the achievement file.

- Following the teacher's instructions in designing the home page of the achievement file to indicate their personality and the content of the file.

- Ensure that the internet is available on the device used to communicate via the platform before taking the exams.

Research Suggestions:

In light of the results of the current research, a set of suggestions can be made as follows:

• The effectiveness of the professional and technological competencies of science teachers and supervisors at the secondary stage for using digital assessment tools in educational platforms in distance education in Iraq.

• Evaluation of digital assessment tools in educational platforms used in distance education from the point of view of male and female science students at the secondary stage in Iraq.

• The effectiveness of digital assessment tools in educational platforms used in distance education in light of comprehensive quality standards from the point of view of experts and specialists.

• The effectiveness of digital achievement tests using digital platforms used in distance education in measuring the higher-order thinking skills of science students at the secondary stage.

• The effectiveness of achievement files on digital platforms used in distance education to develop self-learning skills and critical thinking for science students in the secondary stage.

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