Evaluate Students' Interaction and Happiness in Distance Learning Among Students with Learning-Difficulties During Covid-19 Pandemic

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Abstract

This study aimed at Evaluate Students' Interaction and Happiness in Distance Learning Among Students with Learning-Difficulties, by identifying the level of students' interaction in distance education and differences between them, as well as its impact on their happiness to learn. To achieve the aim of the study, two scales were designed for this purpose and were applied to a sample consisting of (310) individuals. The results showed that the level of students' interaction through the e-learning platform was at a high level. The results also showed that there was no statistically significant difference between the mean scores of males and females in the scale of students' interaction through the e-learning platform. There was no statistically significant difference between them in their happiness for distance learning via the online platform. There were also no statistically significant differences related to the grade variable in the level of interaction through the electronic platform and in the happiness to learn, while there was a positive statistically significant effect of interaction through the electronic platform on students' happiness to learn.

Key words:

Evaluate Students' Interaction; Distance Education; Students with Learning-Difficulties; Happiness

1. Introduction

Considering the scientific and technological revolutions that the world is experiencing today, technological development has become a feature of contemporary societies, and it has resulted in an increase in competitiveness between different countries in the use of technology and its applications in all fields, especially in the field of education. Distance education appeared through electronic platforms to play its basic role in solving problems facing traditional education, such as a shortage of a cadre of teachers, and overcoming the barriers of time and space. With continuous development, e-learning went beyond the mere presentation of courses through websites to including all the requirements of managing the teaching and learning process. Most of the distance education platforms are among the most important e-learning management systems used by most educational institutions around the world because of their excellence in creating interaction between students and their teachers on the one hand and between students and each other on the other hand, through virtual classes, seminars and the ability to send and correct assignments and tests easily [1], [2].

With every crisis, profound challenges and opportunities emerge for transformation, previous education crises have shown that it is possible to rebuild better. If there is a future lesson for education systems in the world, it is that it should work with high flexibility, predicting future scenarios including epidemics, long-term disasters and comprehensive effects and teaching problem-solving skills, crisis management, thinking skills and communication skills which are considered the most important pillars of any successful education. This education must be directed by a flexible, technical citizen who is able to solve problems and communicate as Education will not stop at limits, nor will it stop when students are absent from schools. Rather, it can overcome considerations of time and place, tools, pandemics and crises [3]–[5].

Considering the Corona outbreak, and the measures taken by different countries to protect their citizens, including school and university students, on the list of these measures is the imposition of a complete and partial lockdown, so it has become imperative for educational institutions to replace classroom education with distance education. This rapid and sudden transformation has placed the responsibility on those in charge of teaching different subjects, and it has become imperative for everyone to employ distance learning platforms and the various software needed to teach their courses and communicate with their students efficiently and effectively and try to raise their happiness to learn, especially since it is an unprecedented experience for public education students in most schools [6].

Therefore, distance electronic learning is considered one of the most prominent products produced by the modern revolution in communication and information technology, as the latest findings of these technologies in terms of devices, programs and electronic display methods have been harnessed in the educational process, which provides the opportunity for students to interact directly and indirectly with courses, teachers and colleagues [7], [8].

Distance education means all that is provided to students outside the physical limits of the educational institution, using electronic means that obviate their attendance to the classroom, as is the case in traditional educational institutions (school / university) through live or recorded broadcasts or CDs, or the ability to choose audio-visual programs and applications that contain interactive sites in the field of educational and teaching methods, including: WhatsApp, Google Mate, YouTube, Zoom, Black Power, Microsoft Teams and other modern educational sites that are available on the internet through laptops and smartphones to facilitate the process of communication between teacher and student. Distance education is not based on face-to-face meetings and direct self-communication, as it lacks the element of physical presence and attendance as is the case in traditional education[9]–[22].

The electronic learning platform is also known as the platform or space that allows the electronic content to be displayed to students and allows the management of learning processes electronically starting from the registration of students in the course to the presentation and interaction with the content and the evaluation of the students' performance and the extent of their learning. Examples include: (Moodle), (Black Board) and (Microsoft Teams) systems [3], [23], [24].

Distance e-learning aims at several goals, perhaps the most important of which is creating an interactive learning environment using modern technologies, and the diversity in knowledge sources, means and methods of presenting them, taking into account the individual differences between learners. E-learning also seeks to provide learners with the skills of using communication technologies [25], [26]. It also helps the teacher to deliver scientific subjects in various forms and methods by employing modern technology skills. E-learning also supports interaction between students and teachers through educational experiences, discussions and targeted dialogues, using various communication channels such as e-mail, chat rooms in educational platforms and virtual classes [7], [8], [27], [28].

The importance of studying the group of students with academic learning difficulties is that they face problems in employing appropriate strategies to solve various educational problems. They may employ primitive and weak strategies to solve arithmetic problems and comprehend them, as well as in speaking or written expression [29], [30]. A large part of these difficulties is due to the lack of organization processes which enables a person to gain many experiences, so he needs to carry out the process of organizing these experiences in a successful way [31]. They also face language problems where they do not understand the voice messages addressed to them, or vice versa, as they may not be able to send accurate voice messages to others [32], [33].

Given the importance of using technology to improve the learning process for students with learning difficulties, Neroni et al. [7] noted that using technology improves skills and build literacy abilities. Clark [34] also indicated that the use of technology increases the effectiveness of learning, reduces effort and burden for students with learning difficulties, and improves their happiness .

In light of the current circumstances that have made most educational institutions in most countries, including Saudi Arabia, to apply distance education as an alternative to traditional education, and based on the new perspective of education and achievement; we find that the use of technology in education has a clear effect on the performance of the teacher and the learner and their achievements in the classroom [35].

After reviewing the academic literature related to distance education, its patterns and means of activating it, and through the observation of the methods used in distance education through the e-learning platform in public education, whether by students or teachers, and believing in the importance of providing an active learning environment in which the student interacts positively with the course content that he study, with his teacher and with his colleagues in order for him to achieve real learning and acquire knowledge and information; the topic of the current study has been chosen, especially since distance education is considered a new experience for students in the general education stage in the Kingdom of Saudi Arabia, which requires studying and evaluating its effectiveness from several aspects. This study aimed to measure students' interaction in distance education through the electronic platform and to know its impact on their happiness to learn by discussing the following questions:

1. What is the level of student interaction in distance education?
2. Are there statistically significant differences between the averages of students' scores in their interaction on the electronic platform due to the variables (gender, grade) ?
3. What is the level of students' happiness to learn through the electronic platform?
4. Are there statistically significant differences between the averages of students' scores in their happiness for distance learning through the electronic platform due to the variables (gender, grade) ?
5. What is the effect of students' interaction in distance education via the electronic platform on their happiness to learn?

This current study was of great importance because it was a study that focuses on shedding light on the students' interaction in distance education through the electronic platform and measuring the reality of this interaction and evaluating it from the students' own point of view. This in turn reflects positively on improving the quality of students'

education, cognitive achievement, and their achievements. This study reveals specific reasons for students' positive interaction in distance education, which may increase their happiness to learn. The reasons that reduce their happiness for distance learning and limit their enthusiasm for interaction through the electronic platform can also be identified from an objective and realistic point of view. This study may be a new addition to scientific research and studies related to this topic [36], [36].

2. Theoretical Consideration

2.1 Distance Education

Educational systems have witnessed great developments at the level of learning and teaching strategies as a result of the development of the means of communication as well as the revolution of information and technologies. So, it has become imperative to develop educational systems in line with the new technological revolution [3], [35], [37]. Dhawan [23] points out that no educational system can neglect special changes in technological and technical fields, rather it has become necessary to reform the educational system in line with the requirements of the educational process, and with the nature of modern communication and contact tools.

The world is currently witnessing a crisis that may be the most dangerous in recent times, which is the Corona pandemic, which has had a negative impact on all activities and sectors of life, including the education sector. According to the UNESCO report, "Education disruption due to the new Corona virus and its response", more than 100 countries closed schools, which affected more than half of the world's students, and this resulted in the choice of distance education to continue the educational process [5], [38], [39].

Distance learning is a process of interaction between the learner and educational experiences through various educational means. As what it provides in terms of virtual resources and interactive tools enable the students to communicate with the teacher in educational situations directly through technological and virtual means through which he can communicate with educational resources that are not in front of him directly, because modern technology maximizes learning resources and facilitates the process of acquiring them [40]–[42].

Distance education is a type of education in which educational subjects are re-produced electronically and then published using any technical means to enhance communication between teachers and learners and the educational institution as a whole. It is where students can interact with educational content at any time in relation to their educational needs [43]. It is a type of e-learning characterized by the absence of direct communication between the teacher and the student, as educational subjects are prepared electronically and then published using any technical means and the student is left free to choose the appropriate time to interact with the educational content [44].

Distance education can be implemented through several technical means such as the Internet, telephone, radio, television, messages, or e-mail communication during crises. However, the problem is that the current curricula are not designed for this type of education, but rather they are designed for traditional education, which reduces the effectiveness of distance learning in this case [36].

Distance education includes various types of education, including computer education, education using the MICROCOMPUTER, which includes mobile phones, computers, etc., and which also includes other types of education; including direct education through direct broadcasting on Google applications and others, including indirect education through reordering lectures and upload them to YouTube for students and everyone who needs to watch them [25], [26].

Distance education is sometimes a strategic option for some educational institutions, but the most prominent development that pushed institutions to adopt distance education was the Coronavirus (COVID-19) pandemic, as the pandemic led to the closure of schools during the pandemic to stop the spread of the virus [5], [45].

Among the methods that have received approval during distance education and learning in light of the Corona pandemic is the use of video conferencing programs such as: Google Meet, Black Board, Zoom Meeting, Microsoft Teams because these programs offer the ability to share the entire screen or a specific window, which allows the sharing of presentation information such as documents, presentations, spreadsheets, interactive electronic software, and more [35], [37], [46], [47].

2.2 Interaction in the E-Learning Process

There is no doubt that the education process is a continuous process of communication and interaction between each teacher and his students on the one hand, and the students themselves on the other hand. This interaction in the classroom is the backbone of e-learning. Through interaction, the student can fully immerse himself in the electronic learning environment. The nature of student interaction in the e-learning environment varies according to the type and nature of interaction as well. Interaction also depends heavily on the available techniques in designing student interaction with interfaces [48], [49].

There is no doubt that effective communication of students in educational situations increases their happiness to learn. It can be said that the diversity in methods of presenting the course subject and educational activities is one of the factors that leads to attracting students' attention, keeps them away from distraction, reduces feelings of boredom and increases

their feelings of enthusiasm, especially in distance education, which may make the student feel somewhat isolated from the learning environment. This confirms the importance of integrating him through positive interaction with his teacher and colleagues, in order to stimulate their desire to learn [50], [51].

Hence, the importance of the teacher's role and the contribution that he provides in terms of educational practices and situations in creating different interactions between learners and educational subjects, and between learners each other is emphasized. In addition, good experiences and a positive educational environment, which is free from negative repellents, stimulates students' happiness to learn. This would help the students to develop their own happiness in order to succeed, and to integrate into the educational process with happiness that emanates from the student, not imposed on him from outside [52], [53].

Several studies have identified the types of electronic learning interactions in e-learning environments, such as the studies of Ebner et al [54], Favale et al [55], Radha et al [56] and Aboagye et al [57]. All previous studies agreed on the types of electronic educational interactions, which are the interaction between the learner and the content, the interaction between the learner and the teacher, the interaction between the learner and the learner.

2.3 Interaction between the student and the content in the electronic educational environment

This type of interaction aims to deal with the goal of the interaction directly, which is to achieve the educational objectives contained in the content. This type of interaction is the basis for all other interactions. This type occurs when students study content, take exams, or participate in classroom activities.

The interaction between the student and the content is more interactive and positive within the virtual classroom if written, audio or visual educational materials are used that excite their senses, such as involving the learner in actively thinking about a specific content in order to understand and remember the information. The learner can be involved individually or in groups through questions, exercises and activities that stimulate thinking and constructive interaction with the materials [8].

The availability of this type of interaction in the e-learning environment encourages students to experiment and learn, and helps them to identify different points of view, develops their thinking through open discussions on the web, and also contributes to the development of assessment tools for the knowledge acquired through participation and discussion [58].

2.4 Interaction between the student and the teacher in the electronic learning environment

This type of interaction aims to simplify the educational subject through continuous instructions and guidance of the teacher with the simultaneous and asynchronous tools present within the electronic learning environment states that the teacher should organize the educational subject in e-learning in a way that raises students' thinking by asking interesting and exciting questions with the necessity to involve students in investigating questions of deep thinking, which has a great role in exchanging ideas between students and providing opportunity for them to express their ideas, in order to help them study and discover the information or concepts and skills to be acquired [10], [11], [59].

The study of Pianta et al [60] indicated that there is a positive relationship between the positive interaction between the student and the teacher and between educational achievement and students' behaviour in the classroom. There is a negative relationship between the late interaction between the student and the teacher and between the educational attainment and the behaviour of the students as it leads to a decrease in the level of achievement and negatively affects the student's behaviour.

Despite the importance of student interaction with the teacher in the electronic learning environment; the student misses some of the skills that he may acquire through his interaction with the teacher in the traditional classroom, such as learning good manners of talking, good appearance and personality [61].

This type of interaction in the electronic educational environment provides timely feedback, which helps to develop models for general learning and activate active learning, and to build electronic tests that allow giving the opportunity to submit the test more than once [62].

3.5 Evaluation tools and methods for students with learning difficulties

There are many methods and tools for evaluating students with learning difficulties, as the Ministry of Education has worked to allocate some evaluation methods and tools in proportion to the characteristics of each category. The evaluation process for those with learning difficulties should be based on the needs of each student according to the type of disability and to reveal the performance and level of the student. Among the most important methods and tools for evaluating students with learning difficulties are performance evaluation, achievement portfolios, cognitive tests, observation, and the provision of additional time [12], as these tools are the most used in the field of special education, which directs the current research to focus on them, and among the most important of them are:

A. Achievement tests

There are several roles that achievement tests play, including essay tests, objectivity, editorial work, oral tests, and homework in the educational process. As the periodic application of these types helps to reveal weaknesses in previous learning and provides directions for later learning, in addition it may stimulate the happiness of the learner. Achievement tests provide a means of adapting the learning process to the needs of students, so making sure of the students' performance is done through applying the tests at the beginning of the school year, then teachers can take constructive steps through them to fill the gaps in knowledge revealed by these tests [63]–[67]

With the advancement of information technology, measurement processes and its psychometric theories, it became possible to select items that fit the capabilities of the student who performs the test, using item response theory, in this type of tests the items are detailed to the students, so that the items are selected from a bank of questions that have been calibrated and then the items are presented on the computer screen one by one according to the extent to which it is compatible with the ability of the student [68]–[70]. Standardized achievement tests are characterized by objectivity and reduce the influence of inappropriate and chance factors on grading procedures [71], [72]. By looking at the nature of achievement tests in previous studies, it was found that they are based on computerized adaptive tests for students with learning difficulties, according to the study of Krischler and pit [73] which recommended the need to add such tools and train teachers about them. The integration of technology and information technologies is used to support the learning process for the accurate diagnosis of students with learning difficulties, it is also useful in facilitating and improving the work of teachers and effective treatment of the skills presented to students, so that an accurate path is determined for each student through the adaptive computerized test, which is characterized by containing sound and video, Three-dimensional models fit with the characteristics of this class, and work to increase memorization, focus and attention of students with learning difficulties.

The computerized adaptive test in the mathematics course contributed to improving the skill of solving arithmetic problems for students with learning difficulties in mathematics, which include basic skills such as addition and subtraction, the skill of representing quantities and mental arithmetic, the skill of reading and writing quantities, as well as the ability to perform addition and subtraction operations of graded difficulty, which was a hindrance for students. The researcher recommended the necessity of diversity and merging between tools and activities aimed at academic improvement of students with learning difficulties [28], [74].

As a result of the adoption of distance education due to the current conditions of the Corona pandemic, reliance on such tests is due to their accuracy in assessing the capabilities of students with learning difficulties during learning and to measure learning outcomes after the process of students mastering the skills set on them [75], [76].

B. Evaluation based on the use of portfolio

The achievement portfolio is considered one of the most important modern educational evaluation methods, as it gives an integrated perception of the learner's performance, skills, progress, and overall achievement in a specific field of study, in addition to the strengths and shortcomings of each learner. The achievement portfolios have emerged as an effective tool for collecting information and give vivid examples of student work and monitoring his growth continually as a part of the growing interest in the methods and tools of modern educational evaluation. It is considered a compilation of the learner's work that shows his efforts, progress, and achievement in one portfolio. By monitoring his growth in knowledge, skills and trends in a specific field or fields of study, these works must include the learner's participation in selecting the content of the portfolio, the guidelines for this selection, and the criteria for judging the quality of work, and evidence of the learner's reflections or self-reflections on these works [29], [33], [64], [67], [77]–[80].

3. Methodology

This study used the descriptive approach, for its suitability in answering the study questions and by measuring the interaction of students in distance education via the electronic platform and describing this reality accurately and clearly.

3.1 Population

The current study population consists of all intermediate school students in the first semester of the academic year 2020.

3.2 Sample

The study tools were applied in a preliminary form to a pilot sample of (80) intermediate school students, with the aim of verifying the psychometric properties of the tools and ensuring their clarity and clarity of instructions. After that, the study tools were applied to the main sample of (310) intermediate school students in order to answer the study's questions. Table 1 illustrates the description of the main sample.

Table 1: Table 1: Distribution of Sample According to Gender and Grade

Grade	Gender		Total sample
	Male	Female	
1st	45	61	106
2nd	54	50	104
3rd	48	52	100
Total sample	147	163	310

3.3 Measures

A. students' interaction through the e-learning platform scale.

This scale has been prepared in light of the definition of students' interaction through the e-learning platform, which states: Everything that happens between the student and the content of the educational subject, between the student and the teacher, or between the students and each other, including the participation, the presentation of the performances and point of views through the e-learning platform in order to create a kind of regularity and interaction directed to effective learning.

After reviewing the educational literature and previous studies that dealt with the subject of students' interaction through the e-learning platform, as well as the scales used in these studies; the students' interaction through the e-learning platform scale was built and consisted of 13 statements used four points Likert scale response options. The value of the reliability coefficient was (0.90), which is a high and very acceptable reliability coefficient, which indicates the quality of the scale and the reliability of its results.

B. Happiness to Learn Scale

The happiness scale was used, consisting of (11) statements, and the scores for each statement on the scale ranged between (1-5) degrees: strongly agree (5), agree (4), undecided (3), disagree (2), strongly disagree (1)

The value of the reliability coefficient was (0.845), which is a high and very acceptable reliability coefficient, which indicates the quality of the scale and the reliability of its results.

4. Results

Question 1: What is the level of students' interaction in distance education through the electronic platform Among Students with Learning-Difficulties?

To answer this question and to know the level of interaction through the electronic educational platform among the members of the study sample, the arithmetic means, and standard deviations were calculated for the scale statements and its total score, and the level of interaction through the electronic educational platform was interpreted based on the following criterion:

Table 2. The Standard Adopted in Explaining the Level of Interaction through the E-Learning Platform

Mean		The level of interaction through the electronic educational platform
From	To	
3.25	4	Very high
2.50	3.24	High
1.75	2.49	Average
1	1.74	Low

Table 3: The Arithmetic Means and Standard Deviations of The Sample Responses on The Interaction through the E-Learning Platform Scale

Statement No.	M	SD	Interaction Level
1	3.12	0.794	High
2	2.43	1.046	High
3	2.65	1.055	High
4	3.38	0.849	Very high
5	3.65	0.906	Very high
6	2.89	1.099	High
7	3.32	1.012	High
8	3.80	0.952	High
9	3.76	0.933	Very high
10	3.50	0.850	Very high
11	2.67	1.095	High
12	2.20	1.149	High
13	3.16	0.927	High
Total	3.07		High

Table 3 shows that the level of student interaction through the e-learning platform was within the high and very high level, as the arithmetic mean ranged between (2.20-3.80), and these values are similar to each other, which indicates that the study sample respondents have a high level of interaction via the electronic instruction platform. This indicates that the virtual classroom enables students to actively interact in educational situations.

Question 2: Is there a statistically significant difference between the averages of the students' grades in their interaction through the electronic platform due to the variables of gender and grade?

To answer this question, the t- test was used to indicate the differences. Table 4 shows that there is no statistically significant difference at the level of (0.05) between males and females in the scale of students' interaction through the e-learning platform.

Table 4: Students' Interaction through the E-Learning Platform

Gender	M	SD	df	t	Sig.
Males	38.998	7.89	308	0.235-	0.6741
Females	41.345	6.26			

To find out if there are statistically significant differences between the averages of the students' scores in their interaction via the electronic platform according to the grade variable, one-way ANOVA was used. Table 5 shows that there were no statistically significant differences at a level of (0.05) in the interaction of intermediate school students through the e-learning platform according to the educational grade of the sample members. Which means that the educational level had no effect on the students' interaction through the electronic educational platform among the sample members.

Table 5: One Way ANOVA of Different Students' Interaction through the E-Learning Platform

Variance source	SS	df	F	Sig.
Between groups	129.432	2		
Within groups	14062.502	307	1.260	0.4290
Total	14192.875	309		

Question 3: What is the level of students' happiness to learn through the electronic platform?

To answer this question, arithmetic means, and standard deviations were calculated to determine the level of students' responses to each of the scale phrases, and on the scale as a whole, to judge the level of students' happiness to learn through the electronic platform. The arithmetic averages were divided into categories according to the criteria as shown in Table 6.

Table 6. The Criterion Adopted in Explaining the Level of Happiness to Learn

M		Happiness to learn Level
From	To	
4.3	5	Very high
3.5	4.2	High
2.7	3.4	Average
1.9	2.6	Low
1	1.8	Very low

Table 7 shows that the arithmetic means on the scale statements and the overall score were also high. This indicates that the level of students' happiness to learn through the electronic platform is considered at a good level, especially since distance education is a new experience for most students.

Table 7: The Arithmetic Means and Standard Deviations of The Sample Responses on The Happiness to Learn Scale

Statement No.	M	SD	Happiness to Learn Level
1	3.648	1.12	High
2	3.432	1.13	High
3	3.762	1.65	High
4	3.126	1.01	High
5	4.764	0.23	High
6	4.987	0.65	High
7	4.234	0.01	High
8	4.654	0.02	High
9	4.235	0.04	High
10	4.761	0.11	High
11	4.098	0.10	High
Total	4.875		High

Question 4: Is there a statistically significant difference between the averages of students' grades in their happiness for distance learning through the electronic platform according to the gender and grade variables?

To answer this question, (t- test) for independent samples were used to test the differences between the averages of the two groups after they were classified into a male and female

group. Table 8 shows that the value of(t) was not statistically significant. This indicates that there is no difference between males and females in their responses to the scale statements, and therefore there is no difference in their happiness to learn through the electronic platform.

Table 8: The Value of (t) and Its Statistical Significance between The Mean Scores of Males and The Mean Scores of Females on The Happiness to Learn Scale

Gender	M	SD	df	t	Sig.
Males	44.432	5.43	308	0.341-	0.4675
Females	44.654	5.45			

To find out if there are statistically significant differences between the averages of students' scores in their happiness for distance learning via the electronic platform according to the grade variable, the One-Way ANOVA test was used to find the significance of the differences between the three grades (1st intermediate – 2nd intermediate – 3rd intermediate) that exist in the study sample, based on the total score of the scale. Table 9 shows that the value of F was not statistically significant. This indicates that there are no differences between the different grades (1st intermediate – 2nd intermediate – 3rd intermediate) in their responses to the scale statements, and there are no differences between them in the happiness to learn through the electronic platform.

Table 9. One-Way ANOVA Test to Denote Differences between Different Grades in Their Responses to The Happiness to Learn Scale

Variance source	SS	df	F	Sig.
Between groups	164.346	2	2.871	0.0752
Within groups	7563.453	307		
Total	7431.653	309		

Question 5: What is the impact of students' interaction in distance education through the electronic platform on their happiness to learn?

To answer this question, the correlation coefficient between the two variables was first calculated, and then the correlation coefficient square was calculated to find out the effect, and the value of the Pearson correlation coefficient between the interaction of students in distance education through the electronic platform and their happiness for learning and the effect size evident in Table 10.

Table 10: Pearson Correlation Coefficient and Effect Size between The Two Variables

Pearson's Correlation Coefficient	Sig.	Effect Size
0.863**	0.000	0.463

It is evident from the table 10 that the value of the Pearson correlation coefficient is statistically significant at the level of 0.000 and this indicates that there is a statistically significant relationship between the two variables

(interaction through the electronic platform and the happiness to learn). By multiplying the value of the correlation coefficient, the effect size was (0.463), which is considered significant effect based on criteria for interpreting effect size values. This means that positive interaction through the electronic platform affects approximately 47% of the students' happiness for distance learning.

5. Conclusion

According to the results of the statistical analysis, we find that the level of student interaction through the e-learning platform was at a high level. This indicates that the virtual classroom enables students to actively interact in educational situations. This result is somewhat compatible with the study of Abu Shkheidem et al., (2020), which indicated that the interaction of Palestine University students with e-learning was average at the time of the onset of the pandemic and at the beginning of the shift to distance learning through electronic platforms.

The researchers believe that the high level of student interaction can be explained by the fact that the electronic educational platform provided the possibility of learning in the appropriate place for students, which created psychological comfort for them during learning. The researchers noted that the electronic educational platform provides multiple capabilities in presenting scientific subject topics in various forms (video, PowerPoints, links, pictures, movies). It also allows students to do voice and text conversations, and the access and use of it are easy. These educational methods adopted in the electronic educational platform may help to develop the way in which students learn and the way in which the teacher teaches, which may have a role in motivating students to learn and have interest in the educational subject other than abstract and symbolic methods as in explaining the teacher in the usual way. This is confirmed by the results of the level of happiness to learn science through the electronic platform, where the level was also high. This high level is a good indicator of the effectiveness of distance learning through the electronic platform, especially as it is a new experience of learning for intermediate school students and in its early experimental stages, which were imposed because of the Corona pandemic in a surprising way and was adopted to continue the educational process.

It can be said that the high level of interaction among students through the electronic educational platform and the high level of their happiness to learn may be due to the fact that the electronic educational platforms made the student the center of the educational process and moved the teacher from the role of direct guidance to the role of assistant to students. Thus, the student became more active and energetic and assumed new roles that encouraged him to interact, learn and participate positively in educational activity.

On the other hand, the results did not indicate that there are statistically significant differences between the mean scores of males and females in the scale of student interaction through the electronic educational platform. As well as there are no statistically significant differences between them in their happiness to the distance learning of science through the electronic platform. This can be explained by the fact that learning through the electronic educational platform has become the main source of learning for the students at present. All students, whether female or male, realize the importance and necessity of interacting through the educational platform in the learning process. Also, the sample members are intermediate school students, and the majority of this age group have high skills and ability to deal with digital platforms and technologies in education. This new technology is not only directed to the males more females. The researchers believe that the absence of the differences between them is due to the speed of adaptation of students in this particular age group to any development or change that may occur, and their love and passion for new experiences. The e-learning experience is a new challenge for them because they were not accustomed to this method of learning, and at the same time it is a happiness and a catalyst for them to achieve success in various ways, especially if the method is compatible with technological developments that are considered attractive methods for them.

The results of the statistical analysis indicated that there were no statistically significant differences related to the grade variable, meaning that the student, whether he was in the first, second or third intermediate grade, this did not affect the level of his interaction through electronic educational platform. At the same time, the results did not show statistically significant differences between the three grades in happiness to learn as well, and this is a logical result because, in the opinion of the researchers, there are no breaks or obstacles in the level of interaction through the educational platform where the student in the first, second or third intermediate grade can obtain an equivalent ability to the other in the level of interaction through the electronic educational platform if he directs his energies and thoughts in the right destination. The researchers believe that the reason for this is the very close age of each group, as they are of the same generation, have the same interests, and have the same thinking styles that affect their electronic interaction as well as their happiness to learn and achieve.

When measuring the effect of distance learning via the electronic platform on students' happiness to learn, the result was statistically significant in a positive way. This may be due to the reliance of distance learning through electronic platforms in modern technologies that are considered the language of the new era and that are compatible with the interests of the new generation and their

skills. So, learning through the electronic platform enables them to use their skills and interests in something useful, and at the same time electronic learning is more attractive and more enjoyable for them. This result is consistent with the study of Humeid (2020), which indicated that the teaching of two units of physics course through the strategy of probe thinking in electronic groups is an effective method and has a positive effect on the development of achievement happiness among the students of the study sample. The results also consistent with the results of the study of Al-Akkiah and Al-Baradei (2019), which concluded that the method of participatory electronic interaction (within and between groups) with the mechanism of organizing learning projects (organized) leads to an increase in the level of students' happiness to learn. In addition to Darwish study (2019), which indicated that the use of the Web Quest strategy is an effective method and positively affects happiness to learn physics. The results are also consistent with the results of Anseo (2018) study, which indicated the positive effect of employing the blended learning strategy of the life sciences course in increasing students' happiness to learn, as well as Fouda study (2012), which indicated that the adoption of the integrated strategy that was proposed in the study and based on interactive electronic activities affects very positively and increases the happiness for learning and self-learning among students.

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