Adopting the Online Multiple Intelligences Based Approach for Developing the Academic Achievement of the English Language Students

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Abstract

The present study tried to investigate the impact of a proposed online multiple intelligences based program on developing the academic achievement of the English language students. Declining English language academic achievement among schools students have been reported over many years in Egypt. This study proposes using the multiple intelligences (MIs) theory in combination with the online learning approach as a remedial solution to overcome this problem. The researcher tried to integrate the benefits of MI approach with the advantages of online learning as an attempt to develop the students' English language academic achievement. The quasi- experimental design (control group and experimental group) was adopted for conducting this research. The participants of the study were 60 students randomly selected from the third year preparatory students. The study instruments were the online MI questionnaire and the pre-posttest English achievement test. Reliability and validity of the study instruments were proved. The highest intelligences according to the results of the study online MIs questionnaire were the linguistic, visual-spatial, logical-mathematical and musical intelligences. That's why the researcher tried to make use of these intelligences in order to improve the students' academic achievement in English learning. The control group studied through the traditional instruction using the traditional methods of teaching, while the experimental group participants were taught through the proposed online multiple intelligences program with the designed MIs activities in light of Bloom's taxonomy of cognitive levels in order to evaluate the students' academic achievement. Results revealed that the experimental participants' academic achievement in English was significantly developed. They outperformed their counterparts in the control group. Therefore, it could be concluded that the implementation of the online multiple intelligences program was very effective in developing the English language for the preparatory school students. In light of the study findings, a set of recommendations and future research suggestions were highlighted.

Keywords: Online learning, Multiple Intelligences Theory, English language, academic achievement, preparatory school students.

1. Introduction

Teaching English requires the application of effective teaching and learning strategies which have positive impacts on enhancing students' academic achievement and success. Learning English has become an important means of communication and access of knowledge whether in books or virtually through online resources. Students should be aware of the essential language learning strategies and their multiple intelligences (MIs) profile in order to achieve success and mastery in English language learning. Effective learning strategies have a positive impact on developing students' academic achievement.

Multiple Intelligences (MIs) theory is one of the most effective approaches in education. Howard Gardner proposed the notions inherent in multiple intelligence in the early 1980s suggesting that the there are many different ways to test intelligence. The core of MI theory depends on the personal differences, individualization and recognition of divergent abilities (Gardner, 1983).

Howard Gardner (1993, 1999) advocates that each human being has multiple intelligences profile in different levels which can be strengthened or weakened. Gardner proposes that we can develop the educational process through addressing the different MIs of the students. Gardner pinpoints nine types of intelligences which are linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, interpersonal, intrapersonal, naturalist, and existential.

These nine intelligences can be explored as follows (Gardner 1983, 1999, 2004):
- Linguistic Intelligence which is the ability to manipulate oral and written language effectively, and to have well-developed language skills.
- Logical-Mathematical Intelligence which is the ability to manipulate mathematical operations, thinks logically, and distinguishes patterns.
- Visual/Spatial Intelligence which is the ability to pinpoint colors, visual images and scenes accurately enjoying good artistic and graphic skills.
- Bodily-Kinesthetic Intelligence which is the ability to manipulate and manage bodily movement with well-developed mental and physical skills.
- Musical Intelligence which is the ability to identify and generate musical tones, melodies, and rhythms with the talent for singing and playing musical instruments.
- Interpersonal Intelligence which is the ability to recognize others

feelings and intentions including the ability to communicate effectively using verbal and nonverbal communication skills.

- Intrapersonal Intelligence which is the ability to communicate and respond effectively to other persons.
- Naturalist intelligence which is the ability to understand and classify living creatures like animals, and to be sensitive to the natural world.
- Existential Intelligence which is the ability to recognize profound questions that deal with human existence, such as the meaning and purpose of life.

The Multiple Intelligences can be defined as a learner-based approach which portrays human intelligence as having multiple dimensions which should be recognized and improved. Among the greatest contributions of this theory is the identification of the students' intelligence profile and its applications for developing the learning process. Armstrong (2008) states that each person has all types of intelligences but in different levels. The English teacher in MI classes differs completely from a teacher in the traditional classes. The teacher in MI classroom should keep in mind the educational objective. He should always vary the teaching methods from logical to visual to bodily and so on. He should often integrate intelligences in creative methods paying attention to the individual differences among the learners. The (MI) theory has supported the English language teachers to better distinguish the different ways their students learn in addition to fostering the intelligences which they need for English learning (Botelho, 2003 and Christision, 2005).

Some researchers indicated that intelligence improves academic achievement. Adane (2013) identifies academic achievement as a successful performance in a certain subject area which is reflected in many ways such as scores, marks, and grades. Academic achievement is a significant indicator of a successful future (Habibollah et al., 2008; Farhat Jamil and Ruhi Khalid, 2016). It is measured by the total grade earned at the end of the course. Studies proved that academic achievement is effective on students' multiple intelligences especially in English language classes (Ayesha and Khusrshid, 2013; Mimid, Kasmaini and Elfrida, 2020).

Moreover, Internet becomes one of the dynamic tools for teachers and learners in order to acquire information (Richard and Haya, 2009; Tagoe, 2012; Mankad, 2015). Technologies and smart tools afford convenient and easy education in an effective way overcoming the place and time barrier. Online learning offers various benefits and advantages such as simplicity, consistency, flexibility, remote operability, cost effectiveness,

and others. Online learning is defined as utilizing interactive technologies and communication systems to develop the study sample English language skills. It includes employs e- techniques such as websites, chatting rooms and e-mail to enhance English learning and teaching.

Thus, students' learning styles and individual differences should occupy the priority in order to upgrade the learning process and to achieve effective teaching. Gardner proposes that not only all humans have multiple intelligences, but there are different levels in each intelligence which make each individual uniquely different from the others. As students learn differently, it is not fair to teach all of them in the same method. Teachers should provide their learners with a range of learning options and activities in order to cope with their learning styles and individual differences. MI theory affords the individual student with many alternatives and options for learning. It generates the supportive environment which is essential for developing the students English language skills.

Moreover, online learning asserts that all learners are engaged completely in the learning process together with videos, text, audio, and cooperative activities. It improves the quality of teaching and learning. It provides students the flexibility to take follow their classes anytime and anywhere. That's why the researcher attempted to integrate the MI learning theory with the online learning in order to combine the advantages of both approaches. As a result of the essential role of the MI theory in improving the English learning and teaching, a host of studies has been carried out to that effect. Below is a review of a series of studies dealing with the impact of multiple intelligences theory on students' academic achievement.

2. Review of the Related Literature

Al-Jarf (2004) studied the impact of technology on teaching and learning writing skills for EFL college students in Saudi Arabia using the quasi- experimental design. The experimental group students studied through the internet and computers to examine and evaluate their writing skills. The study results proved that the experimental participants surpassed the control group students in the writing skills. Furthermore, the findings proved that technology affected positively the students' motivation towards writing.

Dillon (2006) studied the impact of the MI theory on the first year students who study a course for English composition. Dillon get out the school borders with the students asking them to "write from their senses" with regard to what they were experiencing (naturalistic intelligence). Then, he asked the students to share their drawings and merge their writings

(interpersonal intelligence). Moreover, students were asked to play some educational games like giving the correct answer to some questions and run to the board to write their answers (bodily-kinesthetic intelligence). Also, they were asked to discuss some topics while playing soft music in the background (musical intelligence). Dillon examined the MI experiment by surveying students' opinions regularly. Findings asserted the students higher enjoyment and learning improvement in the MI classes relative to traditional classes.

Abdulkader, Gundogdo and Eissa (2009) investigated the effectiveness of MI-based programme on developing word recognition and reading comprehension skills of the fifth year students in Egypt. The study followed the quasi-experimental design, control and experimental groups. The study used a pre/posttest to check the potential differences in the two groups' achievement, if any. The study results proved that the experimental group achieved better and surpassed the control group.

Ahmadian and Hosseini (2012) examined the relationship between MIs theory and EFL learners' writing performance. Findings proved that linguistic intelligence can enhance the EFL students' writing performance. Isa (2012) studied the effect of online learning on developing the EFL students writing skills and their attitudes towards writing in Palestine. Findings proved significant differences between the participants' performance and attitude before and after the experimentation of the online program in favor of the post-administration. Hence, using internet enhanced both the EFL students' writing skills and their attitude towards writing.

Ahvan Yaghoob (2015) examined the correlation between MI and the academic achievement of high school students. The findings proved that all types of multiple intelligences have a positive association with academic achievements in English language class.

Ernawati, Tsurayya, and Ghani (2019) studied the relationship between the different types of students' multiple-intelligences in order to determine an effective teaching method for young learners who study English. The study reached the conclusion that students have different interests that some of them prefer singing, others like role-playing and, some students prefer drawing. Thus, multiple-Intelligence assessment improved the identification of students' interests which improved their English academic achievements.

Alilateh and Widyantoro (2019) compared between the impact of MI activities and the conventional activities in listening comprehension, and in the students' interest in learning English. The findings proved that the use of

MI activities in listening comprehension is more effective than the traditional activities. In addition, the multiple intelligence activities in English learning proved to be more effective than traditional activities.

Wu and McMahon (2019) examined the impact of musical intelligence on enhancing the English pronunciation of Chinese students. The study proved that the musical intelligence e-learning approach improved the English language skills and the pronunciation of the Chinese students.

Utomo (2020) investigated the impact of MIs on developing students' mastery of vocabulary. The study results proved that MI theory developed students' mastery of vocabulary. Moreover, students were motivated to learn and reported positive responses toward the learning process.

Bhatti, Teevno, Bukhari (2021) examined the effect of employing the MIs approach on the students' academic achievement in English classes. Results proved that students who learned reading comprehension through the MI approach surpassed their counterparts who learned through the traditional methods.

Based on the previous studies above, it could be concluded that resulted that prior research focused on the relationship between multiple intelligences and different variables of teaching and learning. Hence, based on reviewing related literature, there is a gap in studying the relationship between multiple intelligences and online in English language learning. There is little to no research on the application of the MIs theory in online English learning environments. That's why the researcher tried to integrate the benefits of the MIs approach with the advantages of the online learning as an attempt to develop the students' academic achievement in English language classes.

3. Problem of the Study

In spite of the significance of the English language in the Egyptian society, most students suffer weaknesses in English classes. This can be due to the dominance of the traditional teaching methods and the negligence of the individual differences among the students. Deteriorating English skills among preparatory students was reported along years in Egypt. Many suggestions were introduced to overcome this problem such as the implementation of remedial courses, establishment of support centers, and providing advanced training for the English teachers. However, with the application of all these remedial procedures, the English levels of the preparatory schools students' still becoming progressively worse for years,

and the English skills gap among the students has extended. That's why the present study proposes adopting online learning approach in combination with the multiple intelligence (MI) theory as an effective radical measure in order to respond to these difficulties. The multiple intelligence theory is supposed to offer an efficient approach to English language teaching and learning, however such an approach is rarely applied at the preparatory level in Egypt. Moreover, the study adopts the online learning approach in order to acquire the benefits and advantages of e-learning and new technology in education.

4. Questions of the Study

The present study attempted to investigate why the majority of the preparatory school students are not doing well in English as a Second Language (ESL) exams in Egypt through investigating the following main question:

"What is the effectiveness of the proposed online multiple intelligences based program on developing the 3rd year preparatory school students' academic achievement in English?"

For research purposes, this main question can be divided into the following sub questions:

1. What are the 3rd year preparatory school students' MIs profiles?
2. What are the appropriate online MIs activities for developing the 3rd year preparatory school students' academic achievement in English?
3. To what extent will the proposed online MIs based program be effective on developing the 3rd year preparatory school students' academic achievement in English?

5. Purposes of the study

This study aimed at:

1. Identifying the MIs profiles for the 3rd year preparatory school students.
2. Investigating the effectiveness of the proposed online multiple intelligences based program on developing the preparatory students' academic achievement in English.

6. Hypotheses of the Study

To examine the effectiveness of the present study proposed program, five hypotheses were formulated and tested as follows:

1. There will be statistically significant differences at 0.05 levels between the post-test mean scores of the control and the experimental groups in the English academic achievement in favor of the experimental group.

2. There will be statistically significant differences at 0.05 levels between the posttest mean scores of the control and experimental groups who have linguistic intelligence on the English academic achievement in favor of the experimental group.
3. There will be statistically significant differences at 0.05 levels between the posttest mean scores of the control and experimental groups who have logical-mathematical intelligence on the English academic achievement in favor of the experimental group.
4. There will be statistically significant differences at 0.05 levels between the posttest mean scores of the control and experimental groups who have visual-spatial intelligence on the English academic achievement in favor of the experimental group.
5. There will be statistically significant differences at 0.05 levels between the posttest mean scores of the control and experimental group who have musical intelligence on the English academic achievement in favor of the experimental group.

7. Methodology of the Study

A. Design

The present study employed the quasi-experimental design. It involved two groups, the control group and the experimental group. The control group was taught through the traditional methods of teaching and the traditional activities of the course book "New Hello", while the experimental participants received treatment through the proposed online multiple intelligences program with the MIs activities which activate a variety of students' intelligences designed by the researcher.

B. The study Sample

The population of the study was a random sample of the third year students at the preparatory stage, Al Montazah School for Girls, Damietta Governorate, Egypt, who study the academic book "New Hello"(N. =60 student). The study sample was equivalent in the English achievement level and it was divided randomly into two equal groups, each group consisted of 30 students. The study was carried out during the first term of the academic year 2020.

C. The Study Instruments

The study depended on two instruments for collecting the required data which are:
1. The MIs online questionnaire to determine the students' MIs profile. This questionnaire was carried out online (Appendix 1).

2. The online pre / post English achievement test to compare the progress level of the study students before and after the experimentation (Appendix 2).

The study instruments will be explained as follows:

1. The Online MIs Questionnaire

The MIs questionnaire was developed by the researcher in light of reviewing related literature and MIs-based questionnaires. The study questionnaire aimed at identifying the study sample MIs profiles in order to be considered while designing the proposed online MIs program. The questionnaire is characterized by its simple language and suitability for the study sample.

The questionnaire consisted of 90 statements, 10 statements for each type of intelligences. The student has to choose only one alternative from five alternatives (Strongly Agree, Agree, To some extent, Disagree, and Strongly Disagree). Their evaluations were (5, 4, 3, 2, or 1) respectively. The obtained results from the returned questionnaires were statistically analyzed using the (SPSS). More importantly, the questionnaire was applied electronically online as shown in the following (Figure1).

Figure (1): The Online Multiple Intelligence Questionnaire

1.1 The Online MI Questionnaire Validity

The study questionnaire was submitted to jury members of (6) TEFL experts to investigate how far the questionnaire measures the intended

intelligences and to apply the essential suggestions and modifications. The jury designated that the questionnaire was valid.

1.2 The Online MI Questionnaire Reliability

In order to verify the questionnaire reliability two methods were used; the test re-test method and the internal-consistency reliability.

1.2.1 The test-retest questionnaire reliability

The questionnaire was applied twice to a random sample (N= 30) of the students studying at Al Montazah Preparatory School, Damietta Governorate, Egypt. Then, it was applied again on the same sample with a time interval of two weeks. Then, the Pearson product-moment correlation coefficient was calculated between the scores of the two applications, it was (0.86) which is statistically significant at (0.01) which prove the questionnaire reliability. Thus, the questionnaire is reliable.

1.2.2 The questionnaire internal consistency reliability

The questionnaire was applied twice to a random sample of the students (N= 30) studying at Al Montazah Preparatory School, Damietta Governorate, Egypt. The obtained results were treated statistically using the Cronbach's alpha coefficients method. The obtained result was (0.79). Thus, the questionnaire is reliable.

The MI questionnaire was administered online through the present study program website available at: http://staff.mans.edu.eg/facsed/int. Identifying the students MIs profiles is very noteworthy because it represents an important consideration in designing the proposed program activities with the objective of developing the students' academic achievement in English. The results of the MIs questionnaire were as follows:

Figure 2: Results of the Online MI-Based Questionnaire

The questionnaire results can be illustrated statistically in figure (3) below:
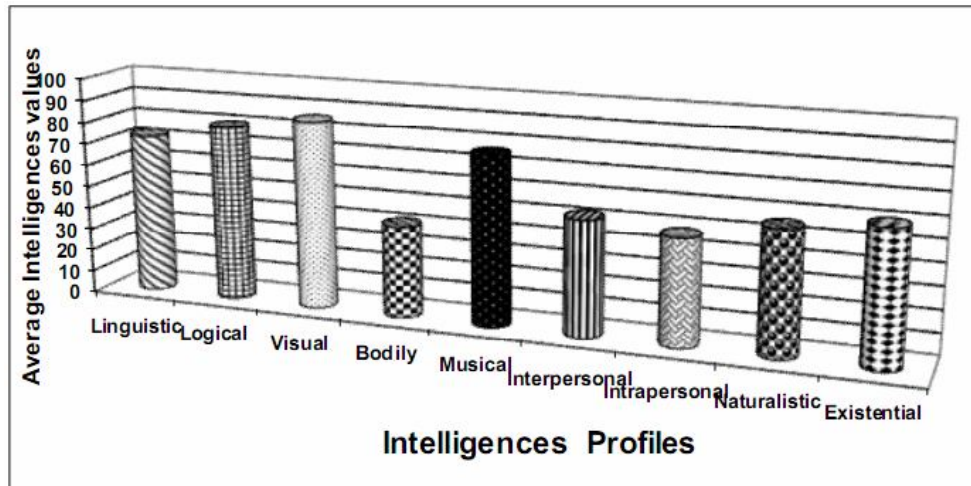
Figure 3: Statistical Results of the MIs Online Questionnaire Administration

Figure (3) illustrated a summary of the students' MI profiles. The data enlightens that from 205 respondents, the highest scores were as follows: visual intelligence with percentage 85.60%, followed by logical Intelligence 80.1%, linguistic 73.2%, musical 76.4%, existential 63.3%, while the naturalistic intelligence was 56.1%, the interpersonal intelligence was 52.3%, the intrapersonal 48.3%, and the bodily-kinesthetic was 41.7%.

As illustrated in the figure above, the intelligences with the highest frequencies were the visual-spatial, logical-mathematical, linguistics, and musical intelligences. Thus, the obtained results came up with an illuminative and revolutionary notion that the experimental students enjoy these intelligences with high frequencies. That's why the researcher tried to make use of these intelligences in order to improve and develop the students' academic achievement in English language classes. The results also showed that some students have more than one type of intelligences.

2. The pre/posttest

The researcher prepared the online pre/post achievement test in order to evaluate the students English language level before and after the experimental treatment. The achievement test addresses the various cognitive levels which are (knowledge, comprehension, application, analysis, synthesis and evaluation). The MI questionnaire results indicated that the students' enjoy very high levels of intelligences in the linguistics, visual-spatial, logical-mathematical and musical intelligences. Thus, the

researcher designed the online pre/post achievement test in order to examine and evaluate the students' achievement level with regard to these intelligences before and after the experimentation.

2.1 Designing the pre/posttest achievements test:

Designing the test followed the steps below:

2.1.1 Aims of the pre/post test

The pre/posttest aimed at evaluating the academic achievement of both the control and experimental groups. It was used as a pretest to verify that both groups were equivalent in their English academic achievement prior to the experiment. Then, it was used as a post-test to assign any possible progress of both groups in the English academic achievement after the experimentation, if any.

2.1.2 Description of the pre/post test

The final version of the achievement test was modified after the pilot study to make sure of the test readability and instructions clarity. The test consists of a reading passage for comprehension followed by varied exercises which address the target measured intelligences. The pre-posttest was carried out online. The allowed time was two hours. The researcher was the admin. She held an introductory meeting online with the students to explain the exam instructions illustrating how to deal with the online exam. The researcher met the student online synchronously to explain how to deal with the program website and the online exam illustrating how to submit their answers. The test shuts down automatically after the allocated time (2 hours). The total marks of the test were (45). The marks of each question were illustrated in front of the question. The student result was the total of the correct answers. The objective questions were corrected electronically through the program website database, while the subjective ones were sent electronically to the researcher e-mail to be corrected. The student's score was the total of the subjective and objective questions. The test was carried out online through the program website.

The pre-posttest aims at evaluating the students' academic achievement through questions that deal with the assigned intelligences (linguistic, visual-spatial, logical mathematical and musical) in light of Bloom's taxonomy which include (knowledge, comprehension, application, analysis, synthesis and evaluation) in order to evaluate the participants achievement before and after the experimentation. The test includes a reading for comprehension passage entitled (FOOD) followed by different exercises that measure the students' academic achievement as shown in figure 3:

Figure 3(a): The Online MI Pre-posttest	Figure 3(b): The Online MI Pre-posttest
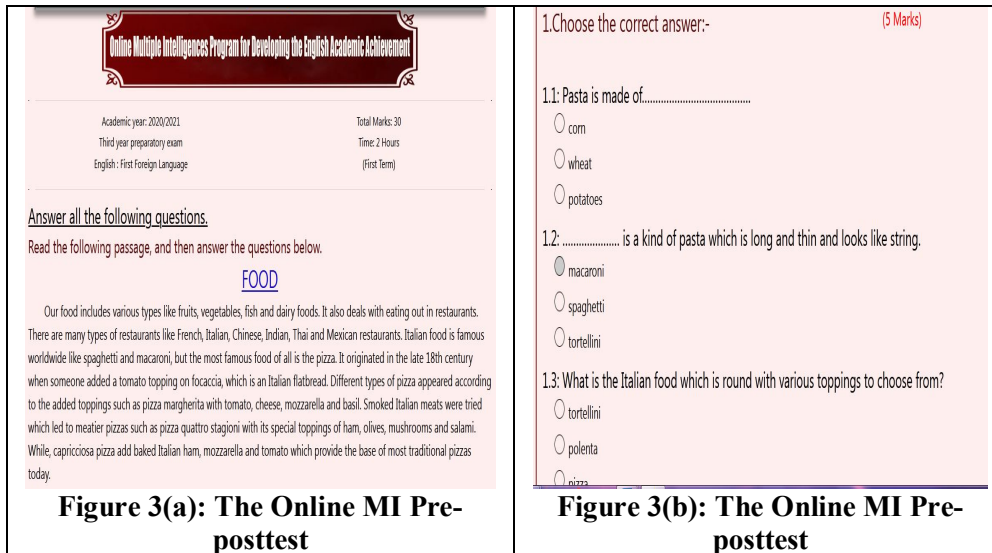
2.1.3 Validity of the pre-post test

The pre-post achievement test was submitted to jury members of (6) TEFL experts in order to check its validity. In light of the jury members' opinions some items were modified and other items were added. Then, the test was formed in its final format and the electronic online version was designed. The test electronic online version was submitted to a jury members of (6) experts in Educational Technology to check its design, usability, and ease of communication. The jury members (TEFL and Educational Technology experts) agreed that the final electronic version of the test was valid.

2.1.4. Reliability of the Test

In order to verify the pre-posttest reliability two methods were used; the test re-test method and the internal-consistency reliability, as follows:

a- The test-retest reliability

The pre-posttest was applied twice to a random sample (N= 30) of the students studying at Al Montazah Preparatory School, Damietta Governorate, Egypt. Then, it was applied again on the same sample with a time interval of two weeks. Then, the Pearson product-moment correlation coefficient was calculated between the scores of the two applications, it was (0.82) at the significance level of (0.01) which prove the pre-posttest reliability.

b - The internal consistency reliability

The pre-posttest was applied twice to a random sample (N= 30) of the students studying at Al Montazah Preparatory School, Damietta Governorate, Egypt. The obtained results were treated statistically using the Cronbach's alpha coefficients method which equals (0.80) at the significance level (0.01). Thus, the pre-posttest is reliable.

8. Materials of the Study

The material of the study is the proposed online MI-based program for developing the academic achievement of the third year Preparatory schools students. The study identified the students' MIs profiles in order to design the suitable activities for the students to develop their academic achievement in English in light of Blooms' taxonomy of cognitive levels which are: knowledge, comprehension, application, analysis, synthesis, and evaluation. The students' academic achievement was measured through examining these cognitive levels. The researcher tried to evaluate the students' academic achievement through measuring and comparing these cognitive levels using the proposed program online MI-based activities. The students' MIs profiles were identified through the study MI questionnaire. Then, the researcher designed the proposed online activities which address both the different Bloom's cognitive levels and the participants varied MIs profiles in order to evaluate the students' academic achievement before and after the experimentation. The study groups were divided in light of their intelligences into four subgroups (linguistics, logical, visual, and musical).

8.1 Objectives of the program

By the end of the experimentation, the students will be able *to:*
- Use new vocabulary associated with Science and Technology.
- Write a correct title of the text.
- Distinguish between facts and opinions.
- Summarize a text including important details.
- Write paragraphs about Technology.
- Expressing certainty and uncertainty using might / must / can't be.

8.2 Content of the Online MIs-based Program

The researcher attempted to provide a proposed model of varied activities making use of the students' highest intelligences in order to develop their academic achievement in English. The highest intelligences in the students MIs profile were the linguistics, logical-mathematical, visual-spatial, and musical intelligences. Thus, the researcher tried to make use of these intelligences to develop the students' academic achievement in English

through developing activities and exercises that address these intelligences in combination with the different cognitive levels of Blooms' taxonomy.

The experimentation was carried out in the first term of the academic year 2020/2021. The researcher analyzed the activities and exercises of the students' book "New Hello" and found that these exercises neglect the students' individual differences and their various MIs profiles. The activities are very associated with the traditional view of intelligence and IQ tests that the linguistic and logical intelligences are dominant. These findings are in agreement with Abdulkader et al. (2009) that the curricula planners in Egypt believe that the different levels of learning are directed to linguistic and logical abilities. Thus, the researcher paid the main consideration to the students' diverse MIs profiles in order to make use of these intelligences in developing their academic achievement in English.

The content of the online MI-based program centered on unit (4) as an example from the student's book "New Hello" of the third year preparatory stage. The unit entitled "Science and Technology". This unit consists of four lessons followed by some exercises but they are presented in a traditional way neglecting the students' individual differences and their various multiple intelligence profiles. In addition, the adopted teaching methods depend only on the traditional methods of teaching abandoning any e-learning techniques which became a must in our educational system nowadays. That's why the researcher developed the exercises of this unit in a way that cope with the students individual differences, varied MIs profiles in addition to adopting the online techniques with all its advantages and facilities. Each participant in the experimental group has his user name and password in order to log in the program website (www. http://staff.mans.edu.eg/facsed/int.) (Figure 4).
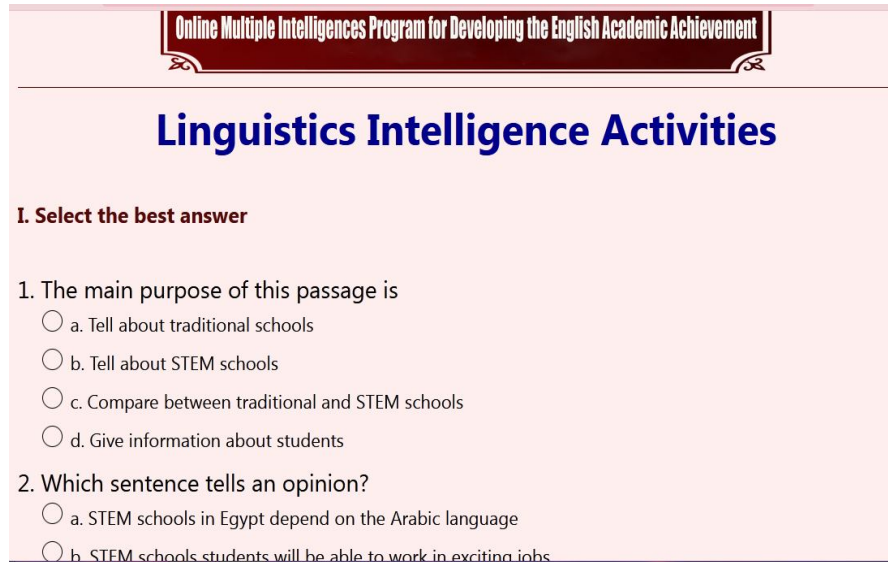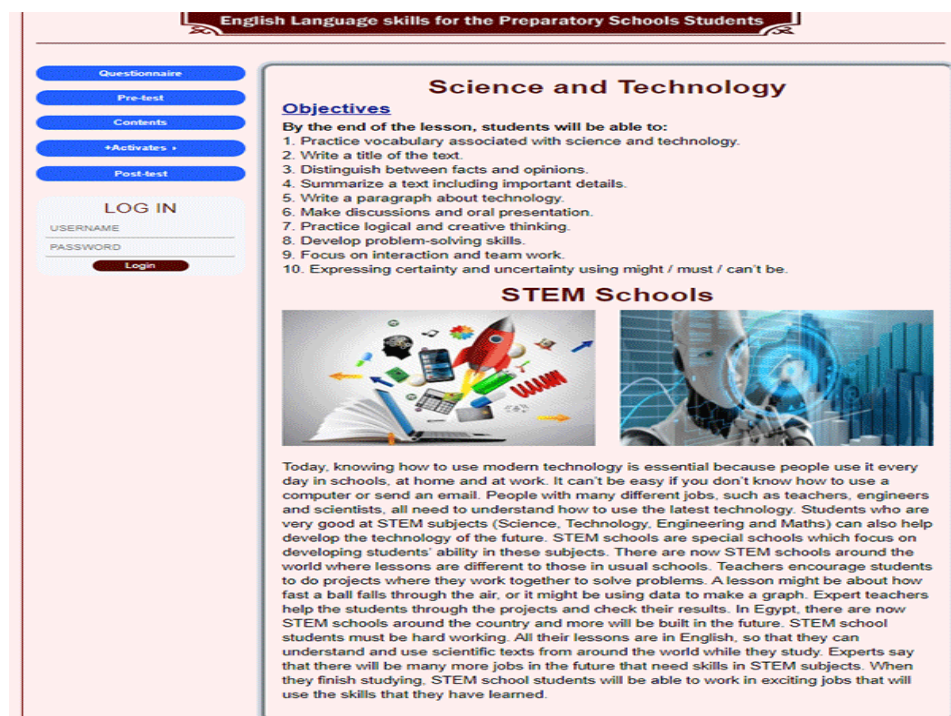
Figure 4: The Online MI Program Content

The two groups (control and experimental) were taught by the researcher. The experimental participants were taught through the online MI-based program, whereas the control group students were taught the traditional course-book with the traditional activities in the traditional face-to-face teaching methods. The researcher designed varied activities which address the target intelligences in light of the results of the students' MIs profiles in combination with the various cognitive levels. These activities will be explained in details as follows:

- The linguistics intelligence activities, the researcher presented and explained the program content for the students illustrating what they are supposed to do (The Intended Learning Outcomes). The content was displayed for the students on their computers through the program website and the researcher explained each point in details. Each student has his ID and password in order to be able to log in the website. The program is characterized by its multimedia effects (colors, motion, sounds, etc.) which were very attractive to the students. The linguistics activities dealt with varied exercises such as multiple choices, defining terms and expressions, grammar, sentences completion, discussion,

giving opinions, summarizing, and paragraph writing as illustrated in figure (5) below.

Figure (5): The Program MIs Online Linguistic Activities

- The visual-spatial intelligence activities, the study program made use of the images, colors, motion, etc. These activities included asking the students to compare between pictures, matching scientific terms with their correct images, using grammatical forms to describe pictures, completing a diagrams with the appropriate terms, vocabulary map to encourage the students to elicit more associated words with the main terms, mind map exercises which ask the students to design a mind map for different terms associated with the unit topic in addition to extracting answers from a drawn mind map to recognize the relationships between its parts. Besides, there were some questions that ask the experimental participants to describe images related to the unit topic, making dialogues out of a picture, and to write paragraphs out of pictures as illustrated in figure (6) below. All activities made use of the visual intelligence to develop the students' academic achievement.

Figure (6): The Program MIs Online Visual Spatial Activities

- Logical-mathematical intelligence activities, these activities include the following exercises: a crossword puzzle exercise about technology to develop the students' vocabulary and terminology, words rearrangement exercise asking students to form meaningful sentences, filling gaps in a diagram to recognize the relationship between its different parts as illustrated in figure (7) below.

Figure (7): The Program Online MIs Logical-mathematical Activities

- The musical intelligence activities, the researcher turned the written text into a song in order to be easy and interesting to the students and to develop their pronunciation and understanding. The researcher developed some pre-listening activities, and the students listen to the text in the song form, then they were asked the same questions once again in addition to some post listening questions. The students became familiar with the rhythmical words. The teacher asked the participants to sing the song many times melodically. They created rhythmic patterns and sang songs. Moreover, there was an exercise about minimal pairs asking the students to repeat the correct pronunciation as they hear it through the program website in addition to defining the meaning of each minimal pair. This exercise was followed by different questions asking the students to identify and give definition for the pronounced terms. Then, the teacher pronounced words with similar pronunciation asking the students to choose and underline the words they hear. Moreover, another exercise dealt with role playing, the students were asked to play the teacher's role and ask their colleagues. The last question asked the participants to get more pairs of words that have similar pronunciation except for one sound as illustrated in figure (8) below.

Figure (8): The Program Online MIs Musical Intelligence Activities

All these activities were carried out online through the program website with its interactive multimedia facilities (images, audio, colors, etc.) which arouse the students' motivation and interest in language learning. The various multiple intelligences activities played a vital role in making the English learning environment very interactive and effective. The most important impact of MIs activities is enhancing the learners' motivation and enthusiasm towards learning a language, especially for learners who may find traditional activities difficult and indigestible. In addition, the multiple intelligences activities enabled the teacher to employ a variety of activities which enable her to touch upon the different types of intelligences among students, which in turn facilitate learning and upgrade academic achievement. In accordance with the MIs theory, intelligences are interconnecting and interacting with each other, no single intelligence work alone by itself which enhance the learning process outcomes.

9. The Experimentation

The MI questionnaire was administered online through the program website for the experimental group, while it was administered traditionally for the control group. The questionnaire results were analyzed statistically to classify the MI profiles of the students. Both groups received six-week instruction. The researcher gave the students some instructions about the MI theory and its advantages in helping them achieve their lessons. The study online program was designed and the activities were formed, modified and others were added in order to address the students' multiple intelligences profiles. Then, the proposed program activities and website were submitted to jury experts (TEFL and Education Technology) to check their suitability for the students and the intended intelligences. In light of the jury members' remarks, some modifications were made.

The proposed program was experimented during the first term of the academic year 2020/2021. The researcher was meeting the experimental participants two classes online a week. The researcher explained to the study groups what they are supposed to do during the experiment. The pre-test was administered to both groups. It was administered traditionally to the control group and online to the experimental group through the program website.

During the experiment, the researcher applied the online MI-based program to the experimental participants. The control group students were taught the traditional course book "New Hello" in the traditional teaching methods with the traditional book activities. While the experimental group studied completely online with the teacher. The program was available to the students online anytime and anywhere. The participants submit their

activities online through the program website. The objective questions were corrected automatically, while the subjective ones were sent to the researcher on the e-mail to be corrected and sending the feedback to the students. The objective of applying the MIs-based activities aimed at motivating and enhancing the students with diverse MIs profiles and diverse learning styles. Besides, the online environment enjoys many facilities which encouraged students learning, interaction and motivation.

At the end of the experimentation, the posttest was administered. The control group was post tested traditionally, while the experimental group was post tested online through the study website. The results of the experimental participants were registered in the program website database. Then, the obtained results were treated statistically in light of the study hypotheses.

10. Results and Discussion

10.1 The Results

Prior to examining the study hypotheses, the t-test for independent samples was calculated between the mean scores of the control and experimental groups on the pretest to check the consistency between the two groups in order to get sure that any differences which may be found on the post test, if any, are owing to the effectiveness of the study proposed program. The table below shows the mean scores, standard deviation and the t-test values for the study groups on the pretest with regard to the cognitive levels and the total test scores to evaluate the students' academic achievement in English as shown in table (2) below.

Table (2): The t-test values for the mean differences between the control and experimental groups on the pretest

Cognitive Level	Study Group	No.	Mean	Standard Deviation	Freedom Degrees	t - Value	Significance level
Knowledge	Control	30	2.451	1.551	78	0.81	0.41 No. sign
	Experimental	30	2.761	1.272			
Comprehension	Control	30	3.221	1.412	78	0.42	0.67 No. sign
	Experimental	30	3.61	1.183			
Application	Control	30	3.415	1.699	78	1.33	0.18 No. sign
	Experimental	30	3.727	1.301			
Analysis	Control	30	2.116	0.981	78	0.23	0.82 No. sign
	Experimental	30	2.416	0.871			
Synthesis	Control	30	3.118	1.524	78	0.71	0.44 No. sign
	Experimental	30	3.421	1.308			
Evaluation	Control	30	4.189	1.867	78	0.67	0.52 No. sign
	Experimental	30	4.467	1.567			
Total Test Scores	Control	30	18.513	3.058	78	1.43	0.16 No. sign
	Experimental	30	20.402	1.927			

As shown in the table above, there are no statistical significant differences between the mean scores of the control and experimental groups at (0.05) levels on the pretest concerning the cognitive levels and the total test scores. These results prove the equivalency of the control and experimental groups prior to the experiment.

For more confirmation that both groups are equivalent in their academic achievement level in English before the experimentation, the researcher divided each study group (control and experimental) into four subgroups. Each subgroup combined the top ten students in each group of the control and experimental who have the highest scores in each type of the four intelligences (linguistic, verbal-spatial, logical-mathematical and musical) according to the results of the MIs questionnaire. Thus, each subgroup was designated for a specific type of the four intelligences. The researcher examined the equivalency between the experimental and control groups in each type of the four intelligences using the Mann-Whitney correlation coefficient for independent samples which is suitable for small groups as follows:

- Examining the equivalency between the control and experimental subgroups with regard to the linguistic intelligence.

The two subgroups were pretested and the results were calculated using the Mann-Whitney correlation coefficient for independent samples in light of the cognitive levels and the total test scores as shown in table (3) below:

Table3: The Mann-Whitney test for the mean ranks between the control and experimental groups with linguistic intelligence on the pretest

Cognitive Level	Study Group	No.	Mean ranks	Sum of ranks	U - Value	Signif. level
Knowledge	Control	10	9.35	93.5	38.50	0.34 No. sign
	Experimental	10	11.64	116.4		
Comprehension	Control	10	10.40	104.0	49.00	0.93 No. sign
	Experimental	10	10.60	106.0		
Application	Control	10	9.05	90.5	39.00	0.36 No. sign
	Experimental	10	11.23	112.3		
Analysis	Control	10	8.42	84.2	46.00	0.88 No. sign
	Experimental	10	9.21	92.1		
synthesis	Control	10	9.89	98.9	43.5	0.81 No. sign
	Experimental	10	11.02	110.2		
Evaluation	Control	10	12.36	123.6	40.50	0.72 No. sign
	Experimental	10	10.63	106.3		
Total Test Scores	Control	10	9.07	90.7	28.5	0.16 No. sign
	Experimental	10	12.98	129.8		

The table above proves that there are no statistically significant differences at the (0.05) level between the mean ranks of the control and experimental groups students with linguistic intelligence in the pre-application of the achievement test concerning the academic achievement (cognitive levels and total test scores) which indicates the equivalence of the two groups.

- Examining the equivalency between the control and experimental subgroups with regard to the visual- spatial intelligent.

The two subgroups were pretested and the results were calculated using the Mann-Whitney correlation coefficient for independent samples in light of the cognitive levels and the total test scores as indicated in table (4) below:

Table 4: The Mann-Whitney test for the mean ranks between the control and experimental groups with visual-spatial intelligence on the pretest

Cognitive Level	Study Group	No.	Mean ranks	Sum of ranks	U - Value	Signif. level
Knowledge	Control	10	10.05	100.5	45.00	0.71 No. sign
	Experimental	10	10.95	109.5		
Comprehension	Control	10	9.89	98.9	46.00	0.77 No. sign
	Experimental	10	10.70	107.0		
Application	Control	10	10.66	106.6	42.50	0.54 No. sign
	Experimental	10	12.18	121.8		
Analysis	Control	10	9.11	91.1	37.00	0.29 No. sign
	Experimental	10	11.61	116.1		
synthesis	Control	10	10.81	108.1	43.5	0.62 No. sign
	Experimental	10	12.01	120.1		
Evaluation	Control	10	10.06	100.6	35.00	0.27 No. sign
	Experimental	10	12.91	129.1		
Total Test Scores	Control	10	10.08	100.8	41.5	0.46 No. sign
	Experimental	10	11.99	119.9		

The table above shows that there are no statistically significant differences at the (0.05) level between the mean ranks of the control and experimental groups students with visual intelligence in the pre-application of the test concerning the academic achievement (cognitive levels and total test scores) which indicates the equivalence of the two groups.

- Examining the equivalency between the control and experimental subgroups with regard to the logical-mathematical intelligence

The two subgroups were pretested and the results were calculated using the Mann-Whitney correlation coefficient for independent samples in

light of the cognitive levels and the total test scores as indicated in table (5) below:

Table 5: The Mann-Whitney test for the mean ranks between the control and experimental groups with logical-mathematical intelligence on the pretest

Cognitive Level	Study Group	No.	Mean ranks	Sum of ranks	U - Value	Signif. level
Knowledge	Control	10	10.79	107.9	45.00	0.71
	Experimental	10	9.88	98.8		No. sign
Comprehension	Control	10	12.36	123.6	39.50	0.36
	Experimental	10	10.14	101.4		No. sign
Application	Control	10	10.11	101.1	35.5	0.27
	Experimental	10	12.89	128.9		No. sign
Analysis	Control	10	9.84	98.4	34.00	0.24
	Experimental	10	12.93	129.3		No. sign
synthesis	Control	10	10.08	100.8	47.5	0.85
	Experimental	10	10.49	104.9		No. sign
Evaluation	Control	10	9.86	98.6	42.00	0.51
	Experimental	10	11.42	114.2		No. sign
Total Test Scores	Control	10	9.86	98.6	37.00	0.29
	Experimental	10	12.34	123.4		No. sign

The table above proves that there are no statistically significant differences at the (0.05) level between the mean ranks of the control and experimental groups students with logical-mathematical intelligence in the pre-application of the achievement test concerning the academic achievement (cognitive levels and total test scores) which indicates the equivalence of the two groups.

- Examining the equivalency between the control and experimental groups with regard to the musical intelligence.

The two groups were pretested and the results were calculated using the Mann-Whitney correlation coefficient for independent samples in light of the cognitive levels and the total test scores as indicated in table (6) below.

Table 6: The Mann-Whitney test for the mean ranks between the control and experimental groups in musical intelligence on the pre test

Cognitive Level	Study Group	No.	Mean ranks	Sum of ranks	U - Value	Signif. level
Knowledge	Control	10	11.80	118.0	36.00	0.28 No. sign
	Experimental	10	9.21	92.1		
Comprehension	Control	10	11.85	118.5	41.00	0.47 No. sign
	Experimental	10	10.01	100.1		
Application	Control	10	11.89	118.9	43.00	0.65 No. sign
	Experimental	10	12.99	129.9		
Analysis	Control	10	9.21	92.1	35.00	0.27 No. sign
	Experimental	10	12.05	120.5		
synthesis	Control	10	11.02	110.2	41.00	0.47 No. sign
	Experimental	10	12.88	128.8		
Evaluation	Control	10	9.78	97.8	34.00	0.24 No. sign
	Experimental	10	12.88	128.8		
Total Test Scores	Control	10	10.21	102.1	40.00	0.39 No. sign
	Experimental	10	12.37	123.7		

The table above proves that there are no statistically significant differences at the (0.05) level between the mean ranks of the control and experimental groups students with regard to the musical intelligence in the pre-application of the test concerning the academic achievement (cognitive levels and total test scores) which indicates the equivalence of the two groups.

Consequently, in light of the tables above results both groups are proved to be equivalent before implementing the experimentation.

Thus, in order to investigate the study hypotheses, the t-test for independent samples was calculated between the control and experimental groups in light of the study variables. The first hypothesis stating that:

- First Hypothesis: There will be statistically significant differences at (0.05) levels between the mean scores of the control group and the experimental group post-test in the English academic achievement in favor of the experimental group.

In order to investigate this hypothesis, the paired samples t-test was calculated. Table (7) shows the means, standard deviations and t-values of the control group and the experimental group concerning the academic achievement (cognitive levels and total test scores) in the post-test.

As shown in the table (7) above, the t-test illustrates that there are statistically significant differences at (0.05) levels between the mean scores of the experimental and control groups in the post-test, the t- value is (7.19) in the knowledge level in favor of the experimental group, the t- value is

(8.69) in the comprehension level in favor of the experimental group, the t-value is (7.23) in the application level in favor of the experimental group, the t- value is (6.34) in the analysis level in favor of the experimental group, the t- value is (8.73) in the synthesis level in favor of the experimental group, the t- value is (9.01) in the evaluation level in favor of the experimental group. Finally, the t- value is (10.13) concerning the total test scores in favor of the experimental group.

In addition to the above, the decrease in the standard deviation between the mean scores of the experimental participants in the post-test indicates the high level of most students, and highlights the closeness and homogeneity of their levels and scores after studying the present study program.

All these results indicate that there are statistically significant differences between the study groups in favor of the experimental group. This means that the experimental participants have achieved highly in the post test. Then, the first hypothesis is supported.

Table 7: The t- test for the mean scores between the control and experimental groups in the post test

Cognitive Level	Study Group	No.	Mean	Standard Deviation	Freedom Degrees	T - Value	Significance level
Knowledge	Control	30	2.817	1.80	78	7.19	0.05
	Experimental	30	5.668	1.27			
Comprehension	Control	30	3.489	1.62	78	8.69	0.05
	Experimental	30	7.412	1.22			
Application	Control	30	3.502	1.81	78	7.23	0.05
	Experimental	30	7.397	1.31			
Analysis	Control	30	2.647	1.91	78	6.34	0.01
	Experimental	30	4.583	1.65			
Synthesis	Control	30	3.608	1.71	78	8.73	0.05
	Experimental	30	6.516	1.34			
Evaluation	Control	30	6.267	1.36	78	9.01	0.05
	Experimental	30	10.192	1.12			
Total Test Scores	Control	30	22.33	7.64	78	10.13	0.05
	Experimental	30	41.743	7.19			

- Second Hypothesis: There will be statistically significant differences at 0.05 levels between the posttest mean scores of the control and experimental groups who have linguistic intelligence on the English academic achievement in favor of the experimental group.

In order to examine this hypothesis, the Mann Whitney (U) test was used to compare the academic achievement between the experimental and

control groups who have linguistic intelligence in the post-test as shown in table (8) below.

Table 8: The Mann-Whitney test values between the experimental and control groups with linguistic intelligent in the post test

Cognitive Level	Study Group	No.	Mean ranks	Sum of ranks	U - Value	Signif. level
Knowledge	Control	10	6.101	64.01	10.5	
	Experimental	10	14.325	143.25		0.05
Comprehension	Control	10	15.00	150.00	10	
	Experimental	10	7.016	70.16		0.05
Application	Control	10	6.051	60.51	6	
	Experimental	10	14.821	148.21		0.05
Analysis	Control	10	7.628	76.28	13	
	Experimental	10	14.806	148.06		0.05
synthesis	Control	10	6.015	60.15	6	
	Experimental	10	14.838	148.38		0.05
Evaluation	Control	10	7.368	77.368	13	
	Experimental	10	14.935	149.35		0.05
Total Test Scores	Control	10	6.982	69.82	11.5	
	Experimental	10	14.592	145.92		0.05

As shown in Table (8), the U-test illustrates that there are statistically significant differences at (0.05) between the mean scores of the experimental and the control groups who have linguistic intelligent in the post-test as far as the cognitive levels and total test scores are concerned in favor of the experimental group.

The U- value is (10.5) in the Knowledge level in favor of the experimental group, the U - value is (10.0) in the comprehension level in favor of the experimental group, the U - value is (6.0) in the application level in favor of the experimental group, the U - value is (13.0) in the analysis level in favor of the experimental group, the U - value is (6.0) in the synthesis level in favor of the experimental group, the U - value is (13.0) in the evaluation level in favor of the experimental group. Finally, the U - value is (11.5) concerning the total test scores in favor of the experimental group.

All these results indicate that there are statistically significant differences between the two groups in favor of the experimental group. This means that the experimental participants have achieved highly in the post test academic achievement with regard to the linguistic intelligent. So, the second hypothesis is verified.

- Third Hypothesis: There will be statistically significant differences at 0.05 levels between the posttest mean scores of the control and

experimental groups who have logical-mathematical intelligence on the English academic achievement in favor of the experimental group.

In order to examine this hypothesis, the Mann Whitney (U) test was used to compare the academic achievement between the experimental and control groups who have logical-mathematical intelligence in the post-test as shown in table (9) below.

Table 9: The Mann-Whitney test values between the experimental and control groups with logical-mathematical intelligence in the post test

Cognitive Level	Study Group	No.	Mean ranks	Sum of ranks	U - Value	Signif. level
Knowledge	Control	10	5.951	59.51	5.5	0.05
	Experimental	10	14.862	148.62		
Comprehension	Control	10	7.264	72.64	20.0	0.05
	Experimental	10	13.252	132.52		
Application	Control	10	6.123	61.23	9.5	0.05
	Experimental	10	14.222	142.22		
Analysis	Control	10	9.113	91.13	25.5	0.05
	Experimental	10	14.012	140.12		
synthesis	Control	10	6.159	61.59	11.0	0.05
	Experimental	10	13.961	139.61		
Evaluation	Control	10	7.035	70.35	10.5	0.05
	Experimental	10	14.925	149.25		
Total Test Scores	Control	10	6.718	67.18	9.0	0.05
	Experimental	10	14.968	149.68		

As shown in Table (9), the U-test illustrates that there are statistically significant differences at (0.05) levels between the mean values of the experimental and the control groups who have logical-mathematical intelligence in the post-test academic achievement (the cognitive levels and the total test scores) in favor of the experimental group.

The U- value is (5.5) in the knowledge level in favor of the experimental group, the U - value is (20.0) in the comprehension level in favor of the experimental group, the U - value is (9.5) in the application level in favor of the experimental group, the U - value is (25.5) in the analysis level in favor of the experimental group, the U - value is (11.0) in the synthesis level in favor of the experimental group, the U - value is (10.5) in the evaluation level in favor of the experimental group. Finally, the U - value is (9.0) concerning the total test scores in favor of the experimental group.

All these results highlight that there are statistically significant differences between the study groups in favor of the experimental group.

This means that the experimental participants outperformed their counterparts in the control group who have logical-mathematical intelligence in the post test academic achievement. So, the third hypothesis is verified.

- Fourth Hypothesis: There will be statistically significant differences at 0.05 levels between the posttest mean scores of the control and experimental groups who have visual-spatial intelligence on the English academic achievement in favor of the experimental group.

In order to investigate this hypothesis, the Mann Whitney (U) test was used to compare the academic achievement between the experimental and control groups who have visual-spatial intelligence in the posttest as shown in table (10) below.

Table 10: The Mann-Whitney test values between the experimental and control with visual-spatial intelligence in the post test

Cognitive Level	Study Group	No.	Mean ranks	Sum of ranks	U - Value	Signif. level
Knowledge	Control	10	7.123	71.23	16.00	0.05
	Experimental	10	13.965	139.65		
Comprehension	Control	10	6.702	67.02	12.50	0.05
	Experimental	10	14.269	142.69		
Application	Control	10	6.961	69.61	15.50	0.05
	Experimental	10	13.821	138.21		
Analysis	Control	10	6.643	66.43	11.00	0.05
	Experimental	10	14.426	144.26		
synthesis	Control	10	6.341	63.41	8.00	0.05
	Experimental	10	14.762	147.62		
Evaluation	Control	10	7.102	71.02	13.00	0.05
	Experimental	10	14.392	143.92		
Total Test Scores	Control	10	6.501	65.01	9.00	0.05
	Experimental	10	14.725	147.25		

As shown in table (10), the U-test illustrates that there are statistically significant differences at (0.05) levels between the mean scores of the experimental and the control groups who have visual-spatial intelligence in the post-test academic achievement (the cognitive levels and total test scores) in favor of the experimental group.

The U- value is (16.00) in the knowledge level in favor of the experimental group, the U - value is (12.50) in the comprehension level in favor of the experimental group, the U - value is (15.50) in the application level in favor of the experimental group, the U - value is (11.00) in the analysis level in favor of the experimental group, the U - value is (8.00) in

the synthesis level in favor of the experimental group, the U - value is (13.00) in the evaluation level in favor of the experimental group. Finally, the U - value is (9.00) concerning the total test scores in favor of the experimental group.

All these results prove that there are statistically significant differences between the two groups in favor of the experimental group. This means that the experimental participants have achieved better in the post test academic achievement as far as the visual-spatial intelligence is concerned. So, the fourth hypothesis is reinforced.

- Fifth Hypothesis: There will be statistically significant differences at 0.05 levels between the posttest mean scores of the control and experimental group who have musical intelligence on the English academic achievement in favor of the experimental group.

In order to examine this hypothesis, the academic achievement scores of post-test in the experimental and control groups were compared using the Mann Whitney (U) test as shown in table (11) below.

Table 11: The Mann-Whitney values between the experimental and control groups with musical intelligence in the post test

Cognitive Level	Study Group	No.	Mean ranks	Sum of ranks	U - Value	Signif. level
Knowledge	Control	10	6.451	64.51	9.50	0.05
	Experimental	10	14.521	145.21		
Comprehension	Control	10	5.923	59.23	10.00	0.05
	Experimental	10	13.952	139.52		
Application	Control	10	5.736	57.36	5.00	0.05
	Experimental	10	14.721	147.21		
Analysis	Control	10	7.261	72.61	13.50	0.05
	Experimental	10	14.512	145.12		
synthesis	Control	10	7.051	70.51	15.50	0.05
	Experimental	10	13.923	139.23		
Evaluation	Control	10	7.216	72.16	17.00	0.05
	Experimental	10	13.854	138.54		
Total Test Scores	Control	10	6.812	68.12	10.00	0.05
	Experimental	10	14.892	148.92		

As shown in Table (11), the U-test illustrates that there are statistically significant differences at (0.05) levels between the mean ranks of the experimental and the control groups who have musical intelligence in the post-test academic achievement (cognitive levels and total test scores) in favor of the experimental group.

The U- value is (9.50) in the knowledge level in favor of the experimental group, the U - value is (10.00) in the comprehension level in

favor of the experimental group, the U - value is (5.00) in the application level in favor of the experimental group, the U - value is (13.50) in the analysis level in favor of the experimental group, the U - value is (15.50) in the synthesis level in favor of the experimental group, the U - value is (17.00) in the evaluation level in favor of the experimental group. Finally, the U - value is (10.00) concerning the total test scores in favor of the experimental group.

Hence, all these results prove that there are statistically significant differences between the control and experimental groups in favor of the experimental group. This means that the experimental participants with musical intelligence have achieved highly in the post test academic achievement. Thus, the fifth hypothesis is supported.

- Effectiveness size : Eta square measure was used to calculate the effectiveness of the proposed online multiple intelligences program for developing the English academic achievement for the preparatory school students as shown in tables (12) below using the following equation:

$$\eta^2 = \frac{t^2}{t^2 + df}$$

Table 12: The Effectiveness of the Proposed Online Multiple Intelligences Program for Developing the English Academic Achievement

Academic Achievement	Study Group	Mean Score	Standard Deviation	t -Value	Eta Square
	Control	22.33	7.64	10.13	0.568
	Experimental	41.743	7.19		

Table (12) explores that there are statistically significant differences at (0.05) between the mean scores of the experimental and control groups. The t-value is (10.13), the mean scores of the experimental group are (41.74), which are greater than those of the control group (22.33). These statistical differences could be interpreted in favor of the experimental group. Therefore, the experimental group students outperformed their counterparts in the control group. The value of the eta-squared is (0.568) which is large (0.281). These results indicate the effectiveness of the proposed program on developing the English academic achievement for the preparatory school students.

Thus, in light of the above discussion, it could be concluded that the statistical significant differences between the experimental participants and the control group students on the posttest can be attributed to the present study online multiple intelligences program for developing the English academic achievement for the preparatory schools students.

10.2 The Discussion of Results

The present study statistical results designated that there were statistically significant differences between the control group and the experimental group post-test in the English academic achievement in favor of the experimental group with regard to the study variables. Academic achievement is measured by the final results earned by the end of the course. In this paper, the results proved that employing multiple intelligences based activities enhanced greatly the students' academic achievement in English language classes. These differences may be ascribed to many reasons such as addressing the students' multiple intelligences which motivated them to learn and made the learning process more accessible and profitable. The study program adopted different types of MIs activities such as reading for comprehension exercises, distinguishing facts from opinions, vocabulary games, terms identification, grammar, summarizing a text, reading and writing activities (linguistic intelligence); puzzles, games, matching exercises, classifications and categorizations (logical-mathematical intelligence); power point presentations, flashcards, describing images, comparing and contrasting pictures, mind map exercises, matching terms with pictures, vocabulary maps, describing and writing about pictures, etc. (visual-spatial intelligence); and singing songs, minimal pairs exercises, comparing and contrasting sounds exercises, etc. (musical intelligence). These activities address the students' MIs profiles and consider their individual differences which motivated them to learn and outperform their counterparts in the control group.

Moreover, the study online platform offered several advantages such as flexibility, simplicity, remote operability, cost effectiveness, consistency and others. The utilization of technology offered convenient and easy education in a more effective manner without barriers of time and place. The online MIs-based program fortified the experimental participants to do their best and attempt harder. It made the learning environment as enjoyable and meaningful as possible for all learning parts. These results go in line with (Currie, 2003; Mankad, 2015, and Davis, 2017; Dumford and Miller, 2018; Huang and Chiu, 2015 and Al Rawashdeh, et al., 2021) that MIs-based instruction assistances EFL teachers to better recognize and approach the different ways their students learn as well as expanse the intelligences which students use to learn. Applying MIs-based instruction helps EFL teachers to develop foreign language instruction through addressing the great diversity in students' profiles and create an individualized learning environment. Furthermore, multiple intelligences can be developed and

evaluated through multimodal learning analytics in an online learning environment. Online learning is an effective approach to cultivate learning which enjoys the potential for overcoming the drawbacks of traditional teaching methods (Ghamrawi, 2014; Jamil & Khalid, 2016; Ahvan and Pour, 2016; Perveen, 2018; Garmen, Rodríguez, García-Redondo & San-Pedro-Veledo, 2019; Irmscher, 2019).

Based on the results gained in the present study, it can be concluded that there are significant differences between the academic achievement of the students who received instruction through the multiple intelligences techniques and the students were educated by the traditional teaching methods. The participants performed better when their intelligences were recognized and addressed. The researcher attempted to teach the students through content and within a context. During the experimentation, the students were asked to match the terms with the correct pictures. An activity like this emphasized on the content and on the matching exercise that is considered as a game for the participants. It gives the students a chance to learn and become familiar with new terms and expressions within a context instead of giving the vocabulary in isolation or as a list and asking students to memorize them. The experimentation made use of flashcards to present new terms, power point presentations, and MIs activities like word puzzles, mind maps, and paragraphs writing using newly learned vocabulary items. The teacher made use of various pictures to teach the learning material. These pictures helped students to make visualization of the new terms. The learners were given the chance to use vocabulary within a purposeful and meaningful context which helped them to learn and remember easily.

Compared to the control group, the experimental participants were encouraged by the present study online MIs-based program that comprehends their abilities as English learners, builds confidence, retains more knowledge and develops their academic achievement. Hence, MI-based instruction assisted the EFL teacher to initiate unforgettable learning experiences and provide the learners with ample opportunities to be successful. These results are in agreement with the conclusions of (Brown, 2000; Currie, 2003, and Pociask and Settles, 2007; Priyanka, 2018; Wright, 2001; Savas, 2012; Soleimani, et al, 2012; and Ibnian, 2013).

Multiple intelligences and second language learning have a continuing and interactive relationship. Multiple intelligences activities enhance students learning, motivation and attitudes in English language teaching and learning. Moreover, online learning represents a potential platform that provides numerous various methods for different styles of

learners in comparison with traditional classroom. Online learning is an influential tool which provides unique learning styles and develops students' academic performances. It further helps in presenting various scientific materials to students in an interesting and interactive manner. Online learning provides flexible communication between students and teachers which develops students' skills and academic achievement. It focuses on the individual learners' needs and how to deliver knowledge effectively in the technological and digital era.

11. Conclusion

The present study investigated the effectiveness of a proposed online MIs-based program for developing the academic achievement of the third year preparatory school students in English. Statistical results showed that MI-based learning is effective on improving the participants' academic achievement in English language classes which emphasizes the importance of identifying the MIs profiles of the EFL students. There are significant differences between the achievement levels of the students were educated by the multiple intelligences approach and the students who were educated by the traditional methods of teaching.

These results assert that employing the MIs-based theory on English language learning creates an effective learning environment that enables students to learn better. EFL teachers should build up their classes depending on all or most types of intelligences that focus on the students' needs and attitudes. In light of the present study findings, EFL teachers and syllabus designers should be encouraged to design courses and activities that employ different multiple intelligences types to pave the way for the inclusion of different abilities of the learners. Intelligences intermingle and interact together in a cooperative ways. English Teaching requires various sets of roles to maintain the attainment of the educational process such as material development and integrating effective teaching strategies.

The results of the present study are in agreement with other researchers such as (Nolen, 2003; Ozdener & Ozcoban, 2004; Ozdemir, Guneysu, & Tekkaya, 2006; Bellflower, 2008; Douglas, Burton, Durham, 2008; Cooper, 2008; Harriman, 2010; Rostami and Soleimani, 2015; and Yaumi, Sirate, and Patak, 2018) who asserted that adopting the multiple intelligence-based approach resulted in noteworthy contribution on students' academic achievement.

Multiple intelligences generate a supportive student-centered learning environment as well as developing students' motivation and skills (Geetha, 2015; Madkour & Mohamed, 2016; Davis, 2017). Different

activities such as linguistics, logical, mathematics, visual-spatial, physical and body-movement, musical skills, ability of human relationship, self-understanding, love of natural environment and higher level of existence led to an elevation of the students' multiple intelligences skills (Siphai, Supandee, Raksapuk, Poopayang & Kratoorerk, 2017; Milad, 2018; Yaumi, Sirate, and Patak, 2018). Moreover, Anbarasi et al. (2015) proved that teaching methods designed in light of the students' learning styles increase their interaction, understanding, and retrieval of the material taught. The application of multiple intelligences strategy upgraded the students' achievement and creative thinking (Widiana, and Jampel, 2016; Chen, Jones & Xu, 2018; Xhomara and Shkembi, 2020).

In summary, the online MI-based approach in English language teaching is more effective than the traditional teaching methods. The MIs-based theory identifies nine diverse potential pathways to learn and to improve the students' academic achievement in English learning. This theory is growing so rapidly in the educational settings. It should be adopted as a way to overcome the difficulties of the students varied learning styles and individual differences. Moreover, online learning is an active method to knowledge transmission. Students prefer the online learning approach as it affords various opportunities to improve their academic achievement and develop their capabilities.

12. Recommendations of the Study

Based on the study results, the following recommendations could be made:

- EFL teacher as well as students should be aware of the MIs-based theory and its applications.
- EFL Teachers should build the learning activities in light of the students' MIs profiles and abilities.
- EFL teachers should be trained in lesson planning according to MIs theory.
- Investigating the effectiveness of online activities on ESL classes to improve the students' language skills and academic achievement.

13. Suggestion for Further Research

- Designing creative MIs courses and activities to develop the academic achievement of EFL learners in different educational stages.
- Investigating the effectiveness of online MI-based activities on other school stages.

- Inspecting the male and female EFL teachers' attitudes concerning class activities in light of the MI-based theory.
- Studying the effect of the EFL teachers' intelligence profile on the students' academic achievement in English language classes.

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