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# Developing Primary Stage Pupils' EFL Vocabulary Learning, Grammar Performance and their Engagement through a Flipperentiated Instruction Web-based Program

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# Developing Primary Stage Pupils' EFL Vocabulary Learning, Grammar Performance and their Engagement through a Flipperentiated Instruction Web-based Program

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***Abstract***

This study aimed at investigating the effect of using a flipperentiated instruction web-based program to develop primary stage pupils' EFL vocabulary learning, grammar performance and their engagement. The participants were two groups of primary six male pupils each. It adopted a quasi-experimental design employing two groups: experimental and control. The design included an independent variable (a flipperentiated instruction web-based program) and three dependent variables (vocabulary learning, grammar performance and engagement) which were measured by an EFL Vocabulary Learning Test, an EFL Grammar Performance Test and an Engagement Scale. Results revealed that there is a statistically significant difference between the mean score of the experimental and control group pupils on the post vocabulary test in favor of the experimental group. In addition, there is a statistically significant difference between the mean score of the experimental and control group pupils on the post grammar performance test in favor of the experimental group. Finally, there is a statistically significant difference between the mean score of the experimental and control group pupils on the engagement scale in favor of the experimental group. These results showed that the flipperentiated instruction web-based program had a positive effect not only on the pupils' vocabulary learning and grammar performance, but also on the pupils' engagement.

**Keywords:** Flipperentiated Instruction, Web-based Program, Vocabulary Learning, Grammar Performance, Engagement, EFL.

## Introduction

English language has become one of the most important means of communication among all people in the 21st century. It is the dominant language of science, technology, the internet, and the media all over the world. It is a means of thinking, conveying messages, and expressing human needs, feelings and emotions. English language learning is important to generate ideas and express thoughts, improve abilities to send and deliver messages that are apt for different situations. In order to better learn English language, learners must acquire its four skills: listening, speaking, reading, and writing. Learning the vocabulary and grammar of the English language is also a must and should be in the heart of the teaching learning process.

Vocabulary is the fundamental element that links the four skills of listening, speaking, reading and writing all together. It is used to express meanings, ideas, thoughts and feelings. Without having an adequate amount of vocabulary, learners will not be able to communicate effectively with others either orally or in a written form. The more vocabulary the learners have in mind, the better understanding they will achieve and the easier the ideas they can convey. Therefore, vocabulary acquisition is a crucial part in successful language learning and mastery of language as well.

A lot of research attention has been paid to the importance of vocabulary as an essential language component and to the teaching methodologies that can boost vocabulary acquisition. Chapman & King (2009) stressed the importance of vocabulary as a key component of reading fluency and comprehension in every subject. They rhymed vocabulary as 'better than money in the bank'. They designed twenty-five ways to teach vocabulary skills using key words in the content information.

Several researchers (e.g., Attya, 2018; El-Genaidy, 2019; Omar, 2019 and Salim, 2019) investigated the effectiveness of using different teaching methods and approaches in developing EFL vocabulary learning in different stages. Some researchers aimed at enhancing vocabulary acquisition and retention (e.g., Mohamed, 2009; Soliman, 2012, El-Garhy, 2013; Ali, 2019 and Elmeleigy, 2019). Other studies focused on the effect of teaching methods on EFL learners' vocabulary use (e.g., Hassan, 2019 and Abd El-Gawad, 2019). Gibriel (2013) investigated vocabulary learning strategies and the factors influencing Egyptian EFL students' strategy use and vocabulary size. All these studies proved to be effective in enhancing EFL learners' vocabulary learning, acquisition, retention, use and size.

Grammar is an integral part of the language and plays a vital role in EFL learning as it helps learners to better understand the language and improve their communication, too. Using good grammar ensures precision and clarity of messages in different situations. Accordingly, teaching the English language cannot do without teaching grammar.

Some researchers (e.g., Al-Mahdi, 2008; Mohammed, 2011; Atteya, 2012 and Abdel Rahim, 2014) researched the effect of using different grammar instruction strategies on enhancing various learners' EFL skills in different stages. Results of these studies revealed better written and oral communicative competence at all levels. Whereas other studies (e.g., El-Kafrawy, 2010; Badawy, 2010 and Mostafa, 2016) focused on the effectiveness of employing different methods in teaching grammatical structures to university students. They provided valuable information

indicating that students' EFL grammar skills can be improved through using new strategies.

Student engagement refers to the student's active participation in academic and co- curricular or school-related activities, and commitment to educational goals and learning. Engagement is 'the heightened, simultaneous experience of concentration, interest, and enjoyment in the task at hand (Shernoff, 2013).' Coates (2005) defines learners' engagement as 'the extent to which students are actively involved in a variety of educational activities that are likely to lead to high quality learning'. The theory of engagement defines engaged learning with reference to two aspects: (1) the activities that involve active cognitive processes and (2) the students that are intrinsically motivated to learn due to the meaningful nature of the learning environment and activities (Kearsley & Shneiderman 1999). Thus, engagement is about learning activities and the way they are performed. From the perspective of this theory, motivation would be a result, the focus being on the design of activities to increase motivation. Motivation is also a starting point for learning and could lead to learning engagement.

For Vinson et al. (2010) the learners' engagement is a key component of student success. Active learning is critical, fundamental to and underlies all aspects of student engagement. An engaged student actively examines, questions, and relates new ideas to old, thereby achieving the kind of deep learning that lasts (Barkley 2010). Engaged learning means that 'all student activities involve active cognitive process such as creating, problem solving, reasoning, decision-making, and evaluation. In addition, students are intrinsically motivated to learn due to the meaningful nature of the learning environment and activities' (Kearsley & Shneiderman 1999). Engagement provides a useful lens for viewing the promotion of psychological well-being as an important end of education in addition to academic achievement (Shernoff 2013). Christenson, Reschly, & Wylie (2012) stressed the importance of student engagement for boosting academic achievement, predicting later achievement and attainment, and mediating the effects of status and academic risk factors.

Flipperentiated instruction is a pedagogical approach to teaching that combines the concept of the flipped learning with differentiated instruction so that direct instruction moves from the group learning space to the individual learning space. The resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter,

Ghoneim, (2017). Hirsch, (2014) stated that while differentiation is the engine, flipped learning is the grease. Used synchronously, they can provide a learning experience that gets students move faster and farther than ever before.

Flipperentiated instruction offers major benefits for both teachers and learners. Hirsch, (2014) pointed out that teachers will recapture instructional time that can be used to deepen learning. Student engagement will likely rise due to more personalized contact with information. And a richer culture of collaboration will emerge among students who learn to work together. Herrera & Velandia, (2017) concluded that flipperentiated instruction helped enhance students' writing as learners had a remarkable improvement in the quality, complexity and clarity of their written texts. The implementation of this strategy contributed to teacher and learners' performance, students' interest towards English learning, and fostering learners' autonomous behaviors.

Chuang et al. (2018) pointed out that one of the benefits of flipping instruction is that it allows differentiated instruction to help students overcome language- learning obstacles. He states two main objectives of the flipperentiatied classroom 1) It blends learning with technology to meet the individualized learning needs of each student and 2) It provides opportunities to further engage students by allowing them to work collaboratively on assignments and projects. He also added that flipperentiation has a lot of advantages such as allowing for traditional instructional models to be transformed through the use of technology while creating a differentiated blended learning model that encourages students' engagement and develops the communication and collaborative skills required in the 21st century.

Another benefit of flipperentiated classroom is that prior knowledge, different learning styles and intelligences allow students to hold discussions and engage in higher cognitive thinking during lessons. They can share thoughts and ideas during peer cooperation in groups before returning to their individual learning spaces to build on what they have learned. This will not only help them keep moving along with their learning path, but it will also ensure that several key skills are developed, from timekeeping to independent study and communication.

**Statement of the problem**

Based on the previous review of literature, the researcher's experience as a teacher of English, and the pilot study results, the problem of this study can be stated as follows: Primary stage pupils need to develop

their EFL vocabulary learning and grammar performance. Thus, the current study examines using a flipperentiated instruction web-based program to develop primary stage pupils' EFL vocabulary learning, grammar performance and their engagement.

**Questions**

This study attempted to answer the following major question:

"To what extent can a flipperentiated instruction web-based program help develop primary stage pupils' EFL vocabulary learning, grammar performance and their engagement?"

This main question leads to the following sub- questions:

1. What are the vocabulary skills necessary for primary stage pupils?
2. What are the grammar skills necessary for primary stage pupils?
3. What are the features of the proposed flipperentiated instruction web-based program required for developing primary stage pupils' EFL vocabulary learning, grammar performance and their engagement?
4. What is the effectiveness of using a flipperentiated instruction web-based program in developing primary stage pupils' EFL vocabulary learning?
5. What is the effectiveness of using a flipperentiated instruction web-based program in developing primary stage pupils' EFL grammar performance?
6. What is the effectiveness of using a flipperentiated instruction web-based program in developing primary stage pupils' engagement?

**Purpose**

The study aimed at:

Developing primary stage pupils' EFL vocabulary learning, grammar performance and their engagement through using a proposed flipperentiated instruction web-based program.

**Hypotheses**

The present study attempted to test the following hypotheses:

1. There is no statistically significant difference at the 0.05 level between the mean scores of both the control and experimental groups on the post administration of the vocabulary learning test.
2. There is a statistically significant difference at the 0.05 level between the mean scores of the experimental group on the pre-post administration of the vocabulary learning test.
3. There is no statistically significant difference at the 0.05 level between the mean scores of both the control and experimental groups on the post administration of the grammar performance test.

4. There is a statistically significant difference at the 0.05 level between the mean scores of the experimental group on the pre-post administration of the grammar performance test.
5. There is no statistically significant difference at the 0.05 level between the mean scores of the control experimental groups on the post administration of the engagement scale.
6. There is a statistically significant difference at the 0.05 level between the mean scores of the experimental group on the pre-post administration of the engagement scale.

**Significance**

This study may be significant in a number of ways:

1- Dealing with two important language skills; namely, vocabulary learning and grammar performance.
2- Flipperentiating instruction with technology in teaching some language skills.
3- Raising the awareness of EFL specialists about the importance of implementing the flipperentiated instruction web-based program in developing language learning.
4- Providing a suggested model of how a flipperentiated instruction web-based program can develop primary stage pupils' EFL vocabulary learning, grammar performance and their engagement.

**Delimitations**

The study was delimited to:

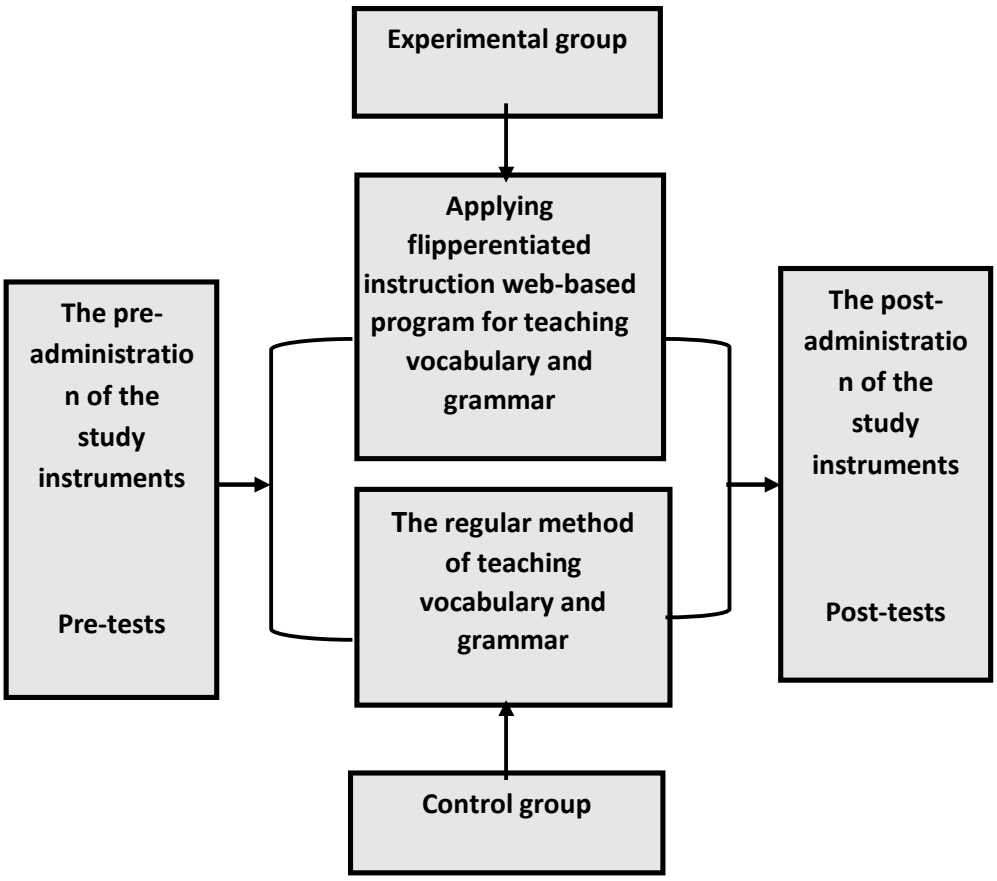
1. Fifty participants from six primary stage pupils.
2. Some EFL vocabulary learning skills necessary for primary stage pupils.
3. Some EFL grammar (namely syntax) performance skills necessary for primary stage pupils.
4. Using Microsoft Office 365 tools (e.g., Microsoft TEAMS, Microsoft Forms, One Drive, Microsoft Stream, and Outlook) through which the proposed flipperentiated instruction web-based program was presented.
5. The term grammar is used here to refer to syntactical structures of the language that primary stage pupils should master.

**Design**

This current study used a quasi-experimental design for assessing the effect of using flipperentiated instruction web-based program on improving vocabulary learning, grammar performance, and engagement. The study used two groups: a control group and an experimental group. The control

group was taught the vocabulary and grammar of English class book of the 6th primary stage (*Family and friends 6!*), 2nd semester from unit 7 to 9 through regular method. The experimental group was taught the same vocabulary and grammar through the flipperentiated instruction web-based program.

**Figure (figure 1): Design of the study**




**Participants**

The participants of the study were two classes of primary six stage pupils at Barbar Primary School for Boys enrolled in the 2nd term of the 2022/2023 school year. Participants of the study comprised of (60) students divided into a control group (N: 30) and an experimental group (N: 30).

**Instruments**

To achieve the purpose of the current study, the researcher applied the following instruments:

- an EFL vocabulary learning test to measure the pupils' level in learning vocabulary.
- an EFL grammar performance test to measure the pupils' level in grammar performance.
- an EFL engagement scale to measure pupils' engagement level towards vocabulary learning and grammar performance.

**Questions of the study**

**"To what extent can a flipperentiated instruction web-based program help develop primary stage pupils' EFL vocabulary learning, grammar performance and their engagement?"**

The following sub-questions were derived from the main question:

1. What are the features of the proposed flipperentiated instruction web-based program?
2. What is the effectiveness of using a flipperentiated instruction web-based program in developing primary stage pupils' EFL vocabulary learning?
3. What is the effectiveness of using a flipperentiated instruction web-based program in developing primary stage pupils' EFL grammar performance?
4. What is the effectiveness of using a flipperentiated instruction web-based program in developing primary stage pupils' engagement?

To answer these questions, a vocabulary learning test, a grammar performance test, and an engagement scale were used to test and determine development in pupils' level, if any, after using flipperentiated instruction web-based program in teaching vocabulary and grammar of the prescribed units.

**Verifying the research hypotheses**

**Testing the first hypothesis**

The first hypothesis stated that *"There is no statistically significant difference at the 0.05 level between the mean scores of both the control and experimental groups on the post administration of the vocabulary learning test"*.

In order to test this hypothesis, the mean scores of the experimental and control group pupils in the post-test of vocabulary learning test were compared and t-value for independent samples was calculated. The following table (22) illustrates the results concerning this hypothesis.

**Table (1): Comparing the control and experimental groups on the post administration of the EFL Vocabulary Learning Test**

| Vocabulary Skills | Groups | N | Mean | Std. Deviation | T Value | df | Sig |
|---|---|---|---|---|---|---|---|
| Vocabulary Form | Experimental | 30 | 7.97 | 0.183 | 27.95 | 58 | 0.01 |
| | Control | 30 | 4.4 | 0.675 | | | |
| Vocabulary Pronunciation | Experimental | 30 | 7.183 | 0.6628 | 12.96 | 58 | 0.01 |
| | Control | 30 | 4.633 | 0.8503 | | | |
| Vocabulary Meaning | Experimental | 30 | 14.3 | 1.95 | 10.765 | 58 | 0.01 |
| | Control | 30 | 8.8 | 2.007 | | | |
| Vocabulary Use | Experimental | 30 | 9.47 | 0.86 | 23.31 | 58 | 0.01 |
| | Control | 30 | 3.97 | 0.964 | | | |
| Total | Experimental | 30 | 38.917 | 2.4036 | 27.862 | 58 | 0.01 |
| | Control | 30 | 21.80 | 2.3547 | | | |

*** Sig. at 0.01**

The results in table (1) show that there was a statistically significant difference between the mean scores of the experimental group students and that of the control group on the post application of the vocabulary test in favor of the experimental group. This difference was significant for each question and for the total of the test. The mean scores of the experimental group on test questions were higher than those of the control group. The mean scores of the experimental group on the total of the test were also higher than those of the control group. They were 21.80 for the control group and 38.917 for the experimental group in the post-test of the vocabulary learning test. Thus, these differences were in favor of the experimental group as indicated by T-value (27.862) which is significant at (.001) level and degree of freedom (df) = 58.

To conclude, the experimental group outperformed the control group in vocabulary learning. This result could be due to the use of the flipperentiated instruction web-based program. So, this program proved to be better than the regular method in teaching vocabulary and in enhancing vocabulary learning.

**Testing the second hypothesis of the study**

The second hypothesis indicated that, " *There is a statistically significant difference at the 0.05 level between the mean scores of the experimental group on the pre-post administration of the vocabulary learning test*".

For testing this Hypothesis, the mean score of the experimental group students in the pre-test and post-test of vocabulary learning test were

compared and t-value concerning vocabulary learning development and the total score in the post- administration of the test is illustrated in table (2).

**Table (2): Comparing the experimental group pre and post testing scores on the Vocabulary Learning Test**

| Vocabulary Skills | Measurement | N | Mean | Std. Deviation | T Value | df | Sig | (η2) |
|---|---|---|---|---|---|---|---|---|
| Vocabulary Form | Pre | 30 | 2.83 | 1.02 | 27.893 | 29 | 0.01 | 0.964 |
| | Post | | 7.97 | 0.183 | | | | |
| Vocabulary Pronunciation | Pre | 30 | 2.45 | 0.5923 | 34 | 29 | 0.01 | 0.976 |
| | Post | | 7.183 | 0.6628 | | | | |
| Vocabulary Meaning | Pre | 30 | 4.93 | 1.946 | 17.95 | 29 | 0.01 | 0.917 |
| | Post | | 14.30 | 1.95 | | | | |
| Vocabulary Use | Pre | 30 | 1.33 | 1.845 | 24.3 | 29 | 0.01 | 0.953 |
| | Post | | 9.47 | 0.86 | | | | |
| Total | Pre | 30 | 11.55 | 3.6112 | 39.25 | 29 | 0.01 | 0.982 |
| | Post | | 38.917 | 2.4036 | | | | |

*** Sig. at 0.01**

Results of table (2) indicate that there is a statistically significant difference between the mean scores of the pre-test (X1= 11.55) and post-test (X2= 38.917) of the experimental group students in the overall vocabulary learning test in favor of the post-test. The table also shows that the estimated t-value is highly significant at 0.01 level.

To show the extent of the flipperentiated instruction web-based program's effect on the experimental group in the vocabulary learning, the **"Effect Size"** was estimated. "$\eta^2$" was calculated using the following formula: (Affana, 2000: 42)

$$\eta 2 = \frac{t2}{t2 + df}$$

According to "$\eta^2$ ", if ($\eta 2 \geq (15\%)$ then, Effect size is High. If $(6\%) \leq \eta 2 < (15\%)$ then, Effect size is Medium. If ($\eta 2 < 6\%$ then Effect size is low. The following table (24) shows values of ($\eta 2$) and the effect size of the treatment on developing vocabulary learning.

**Table (3): The Effect Size of the flipperentiated instruction web-based program in the Pre- and the Post Test of the Experimental Group**

| Skill | η2 | Effect size |
|---|---|---|
| **(Q1)** Vocabulary Form | 0.964% | High |
| **(Q2)** Vocabulary Pronunciation | 0.976% | High |
| **(Q3)** Vocabulary Meaning | 0.917% | High |
| **(Q4)** Vocabulary Use | 0.953% | High |
| **Total** | 0.982% | High |

From the previous table (Table 3), values of ($\eta$**2**) for sub questions ranged from 0.917 and 0.982 and were 0.982 for the total score of the test. The differences between the pre- and post-administration can be clarified as follows:

1. Ninety-six percent of the total variance of the experimental group students' post achievement in Q1 can be attributed to the proposed treatment.
2. Ninety-seven percent of the total variance of the experimental group students' post achievement in Q2 can be attributed to the proposed treatment.
3. Ninety-one percent of the total variance of the experimental group students' post achievement in Q3 can be attributed to the proposed treatment.
4. Ninety-five percent of the total variance of the experimental group students' post achievement in Q4 can be attributed to the proposed treatment.
5. Ninety-eight percent of the total variance of the experimental group students' post achievement in the total test can be attributed to the proposed treatment.

The previous values show the strong effect of the flipperentiated instruction web-based program on pupils' vocabulary learning. This means that the effect of the program is significant. Therefore, the second hypothesis of the study is accepted.

**Testing the third hypothesis**

The third hypothesis indicated that, *" There is no statistically significant difference at the 0.05 level between the mean scores of both the control and experimental groups on the post administration of the grammar performance test".*

To investigate this hypothesis, the mean scores of the experimental and control group pupils in the post-test of grammar performance test were compared and t-value for independent samples was calculated. The following table (4) illustrates the results concerning this hypothesis.

**Table (4): Comparing the control and experimental groups on the post Grammar Performance Test**

| Sub skills | Groups | N | Mean | Std. Deviation | T Value | df | Sig |
|---|---|---|---|---|---|---|---|
| To use object pronouns in questions and statements | Experimental | 30 | 1.87 | 0.346 | 6.02 | 58 | 0.01 |
| | Control | 30 | 1.13 | 0.571 | | | |
| To use the relative pronouns who and which properly. | Experimental | 30 | 5.07 | 0.74 | 12.22 | 58 | 0.01 |
| | Control | 30 | 2.73 | 0.74 | | | |
| To express the past continuous tense correctly | Experimental | 30 | 1.8 | 0.407 | 8.164 | 58 | 0.01 |
| | Control | 30 | 0.63 | 0.669 | | | |
| To use the past continuous in negative sentences and questions | Experimental | 30 | 1.83 | 0.379 | 9.571 | 58 | 0.01 |
| | Control | 30 | 0.97 | 0.32 | | | |
| To contrast the past simple tense to the past continuous tense. | Experimental | 30 | 2.37 | 0.49 | 6.61 | 58 | 0.01 |
| | Control | 30 | 1.37 | 0.669 | | | |
| To write new sentences using 'when' and 'while' with the past simple tense and past continuous tense. | Experimental | 30 | 3.27 | 0.907 | 7.251 | 58 | 0.01 |
| | Control | 30 | 1.2 | 1.27 | | | |
| To use the grammar homophones: there, they're, their correctly. | Experimental | 30 | 5.03 | 1.098 | 10.261 | 58 | 0.01 |
| | Control | 30 | 2.47 | 0.819 | | | |
| To write dates with the proper preposition of time correctly. | Experimental | 30 | | 0.305 | 6.382 | 58 | 0.01 |
| | Control | 30 | 1.27 | 0.45 | | | |
| To use the expression was born correctly. | Experimental | 30 | 63 | 0.49 | 12.643 | 58 | 0.01 |
| | Control | 30 | 03 | 0.49 | | | |
| Total | Experimental | 30 | 5.77 | 2.487 | 18.313 | 58 | 0.01 |
| | Control | 30 | 2.8 | 2.976 | | | |

Results in table (4) show that there was a statistically significant difference between the mean scores of the experimental group students and that of the control group on the post application of the grammar performance test in favor of the experimental group. This difference was significant for each question and for the total of the test. The mean scores of the experimental group on test questions were higher than those of the control group. The mean scores of the experimental group on the total of the

test were also higher than those of the control group. They were (12.8) for the control group and (25.77) for the experimental group in the post-test of the vocabulary learning test. Thus, these differences were in favor of the experimental group as indicated by T-value (18.313) which is significant at (.001) level and degree of freedom (df) = 58.

To conclude, the experimental group outperformed the control group in grammar performance. This result could be due to the use of the flipperentiated instruction web-based program. So, this program proved to be better than the regular method in teaching grammar and in enhancing grammar performance.

**Testing the fourth hypothesis of the study**

The fourth hypothesis indicated that, " *There is a statistically significant difference at the 0.05 level between the mean scores of the experimental group on the pre-post administration of the grammar performance test*".

For testing this hypothesis, the mean score of the experimental group students in the pre-test and post-test of grammar performance test were compared and t-value concerning grammar performance development and the total score in the post- administration of the test is illustrated in table (5).

**Table (5): Comparing the Experimental group pre and post testing scores on the Grammar Performance Test**

| Sub skills | Measurement | N | Mean | Std. Deviation | T Value | df | Sig | (η2) |
|---|---|---|---|---|---|---|---|---|
| To use object pronouns in questions and statements | Pre | 30 | 0.57 | 0.626 | 9.5 | 29 | 0.01 | 0.757 |
| | Post | | 1.87 | 0.346 | | | | |
| To use the relative pronouns who and which properly. | Pre | 30 | 1.33 | 0.661 | 20.86 | 29 | 0.01 | 0.938 |
| | Post | | 5.07 | 0.74 | | | | |
| To express the past continuous tense correctly | Pre | 30 | 0.27 | 0.521 | 12.324 | 29 | 0.01 | 0.84 |
| | Post | | 1.80 | 0.407 | | | | |
| To use the past continuous in negative sentences and questions | Pre | 30 | 0.63 | 0.49 | 10.77 | 29 | 0.01 | 0.8 |
| | Post | | 1.83 | 0.379 | | | | |
| To contrast the past simple tense to the past continuous tense. | Pre | 30 | 0.97 | 0.669 | 8.573 | 29 | 0.01 | 0.717 |
| | Post | | 2.37 | 0.49 | | | | |

| Sub skills | Measurement | N | Mean | Std. Deviation | T Value | df | Sig | (η2) |
|---|---|---|---|---|---|---|---|---|
| To write new sentences using 'when' and 'while' with the past simple tense and past continuous tense. | Pre | 30 | 0.83 | 1.02 | 10.66 | 29 | 0.01 | 0.797 |
| | Post | | 3.27 | 0.907 | | | | |
| To use the grammar homophones: there, they're, their correctly. | Pre | 30 | 1.53 | 1.279 | 12.383 | 29 | 0.01 | 0.841 |
| | Post | | 5.03 | 1.098 | | | | |
| To write dates with the proper preposition of time correctly. | Pre | 30 | 0.67 | 0.661 | 9.28 | 29 | 0.01 | 0.748 |
| | Post | | 1.90 | 0.305 | | | | |
| To use the expression was born correctly. | Pre | 30 | 0.53 | 0.681 | 12.463 | 29 | 0.01 | 0.843 |
| | Post | | 2.63 | 0.49 | | | | |
| Total | Pre | 30 | 7.33 | 2.832 | 28.06 | 29 | 0.01 | 0.964 |
| | Post | | 25.77 | 2.487 | | | | |

Results of table (5) indicate that there is a statistically significant difference between the mean scores of the pre-test (X1= 7.33) and post-test (X2= 25.77) of the experimental group students in the overall grammar performance test in favor of the post-test. The table also shows that the estimated t-value is highly significant at 0.01 level.

To show the extent of the flipperentiated instruction web-based program's effect on the experimental group in the grammar performance, the **"Effect Size"** was estimated. "η²" was calculated using the following formula: (Affana, 2000: 42)

$$\eta 2 = \frac{t2}{t2 + df}$$

According to "η² ", if (η2 ≥ (15%) then, Effect size is High. If (6%) ≤ η2 < (15%) then, Effect size is Medium. If (η2 < 6% then Effect size is low. The following table (25) shows values of (η2) and the effect size of the treatment on developing grammar performance.

**Table (6): The Effect Size of the flipperentiated instruction web-based program in the Pre- and the Post Test of the Experimental Group**

| **Sub-Skills** | η**2** | Effect size |
|---|---|---|
| To use object pronouns in questions and statements | 0.757% | High |
| To use the relative pronouns who and which properly. | 0.938% | High |
| To express the past continuous tense correctly | 0.84% | High |
| To use the past continuous in negative sentences and questions | 0.80% | High |
| To contrast the past simple tense to the past continuous tense. | 0.717% | High |
| To write new sentences using 'when' and 'while' with the past simple tense and past continuous tense. | 0.797% | High |
| To use the grammar homophones: there, they're, their correctly. | 0.841% | High |
| To write dates with the proper preposition of time correctly. | 0.748% | High |
| To use the expression was born correctly. | 0.843% | High |
| **Total** | 0.964% | High |

From the previous table (table 6), values of (η**2**) for sub questions ranged from 0.717 and 0.938 and were 0.964 for the total score of the test. The differences between the pre- and post-administration can be clarified as follows:

1. Seventy-five percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 1 can be attributed to the proposed treatment.
2. Ninety-three percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 2 can be attributed to the proposed treatment.
3. Eighty-four percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 3 can be attributed to the proposed treatment.
4. Eighty percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 4 can be attributed to the proposed treatment.
5. Seventy-one percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 5 can be attributed to the proposed treatment.
6. Seventy-nine percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 6 can be attributed to the proposed treatment.

7. Eighty-four percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 7 can be attributed to the proposed treatment.
8. Seventy-four percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 8 can be attributed to the proposed treatment.
9. Eighty-four percent of the total variance of the experimental group pupils' post grammar performance test in sub-skill 9 can be attributed to the proposed treatment.
10. Ninety-six percent of the total variance of the experimental group pupils' post grammar performance test in the total test can be attributed to the proposed treatment.

The previous values show the strong effect of the flipperentiated instruction web-based program on pupils' grammar performance. This means that the effect of the program is significant. Therefore, the second hypothesis of the study is accepted.

**Testing the fifth hypothesis**

The fifth hypothesis indicated that, *" There is* no statistically significant difference at the 0.05 level between the mean scores of both the control and experimental groups on the post administration of the engagement scale*"*.

To investigate this hypothesis, the mean scores of the experimental and control group pupils in the post administration of the engagement scale test were compared and t-value for independent samples was calculated. The following table (7) illustrates the results concerning this hypothesis.

**Table (7): Comparing the control and experimental groups on the post administration of the engagement scale**

| An EFL Engagement Scale | Groups | N | Mean | Std. Deviation | T Value | df | Sig |
|---|---|---|---|---|---|---|---|
| Cognitive engagement | Experimental | 30 | 30 | 1.983 | 11.12 | 58 | 0.01 |
| | Control | 30 | 18.63 | 5.236 | | | |
| Behavioral Engagement | Experimental | 30 | 29.93 | 1.837 | 15.652 | 58 | 0.01 |
| | Control | 30 | 17.37 | 3.996 | | | |
| Emotional Engagement | Experimental | 30 | 25.8 | 1.324 | 11.613 | 58 | 0.01 |
| | Control | 30 | 15.97 | 4.445 | | | |
| Total | Experimental | 30 | 85.73 | 3.237 | 15.526 | 58 | 0.01 |
| | Control | 30 | 51.97 | 11.464 | | | |

Results in Table (7) show that there was a statistically significant difference between the mean scores of the experimental group pupils and that of the control group on the post administration of the engagement scale in favor of the experimental group. This difference was significant for each item and for the total of the scale. The mean scores of the experimental group on scale items were higher than those of the control group. The mean scores of the experimental group on the total of the scale were also higher than those of the control group. They were (51.97) for the control group and (85.73) for the experimental group in the post-test of the vocabulary learning test. Thus, these differences were in favor of the experimental group as indicated by T-value (15.526) which is significant at (.001) level and degree of freedom (df) = 58.

To conclude, the experimental group outperformed the control group in learning engagement. This result could be due to the use of the flipperentiated instruction web-based program. So, this program proved to be better than the regular method in engaging pupils.

**Testing the sixth hypothesis of the study**

The sixth hypothesis indicated that, " *There is a statistically significant difference at the 0.05 level between the mean scores of the experimental group on the pre-post administration of the grammar performance test*".

For testing this hypothesis, the mean score of the experimental group students in the pre and post administration of engagement scale were compared and t-value concerning engagement development and the total score in the post- administration of the scale is illustrated in table (8).

**Table (8): Comparing the Experimental group pre and post administration of the engagement scale**

| An EFL Engagement Scale | Measurement | N | Mean | Std. Deviation | T Value | df | Sig | (η2) |
|---|---|---|---|---|---|---|---|---|
| Cognitive engagement | Pre | 30 | 17.47 | 4.1 | 18.05 | 29 | 0.01 | 0.918 |
| | Post | | 30 | 1.983 | | | | |
| Behavioral Engagement | Pre | 30 | 16 | 4.152 | 18.84 | 29 | 0.01 | 0.924 |
| | Post | | 29.93 | 1.837 | | | | |
| Emotional Engagement | Pre | 30 | 14.1 | 2.618 | 20.913 | 29 | 0.01 | 0.938 |
| | Post | | 25.8 | 1.324 | | | | |
| Total | Pre | 30 | 47.57 | 9.183 | 24.154 | 29 | 0.01 | 0.953 |
| | Post | | 85.73 | 3.237 | | | | |

Results of table (8) indicate that there is a statistically significant difference between the mean scores of the pre administration (X1= 47.57) and post administration of the engagement scale (X2= 85.73) of the experimental group students in the overall engagement scale in favor of the post-test. The table also shows that the estimated t-value is highly significant at 0.01 level.

To show the extent of the flipperentiated instruction web-based program's effect on the experimental group in the engagement scale, the **"Effect Size"** was estimated. "$\eta^2$" was calculated using the following formula: (Affana, 2000: 42)

$$\eta 2 = \frac{t2}{t2 + df}$$

According to "$\eta^2$ ", if ($\eta 2 \geq (15\%)$ then, Effect size is High. If $(6\%) \leq \eta 2 < (15\%)$ then, Effect size is Medium. If ($\eta 2 < 6\%$ then Effect size is low. The following table (9) shows values of ($\eta 2$) and the effect size of the treatment on developing engagement.

**Table (9): The Effect Size of the flipperentiated instruction web-based program in the Pre- and the Post Test of the Experimental Group**

| Dimension | $\eta 2$ | Effect size |
|---|---|---|
| Cognitive engagement | 0.918% | High |
| Behavioral Engagement | 0.94% | High |
| Emotional Engagement | 0.983% | High |
| **Total** | 0.953% | High |

From the previous table (Table 9), values of ($\eta$**2**) for sub questions ranged from 0.918 and 0.983 and were 0.953 for the total score of the test. The differences between the pre- and post-administration can be clarified as follows:

1. Ninety-one percent of the total variance of the experimental group pupils' post achievement in cognitive engagement can be attributed to the proposed treatment.
2. Ninety-four percent of the total variance of the experimental group pupils' post achievement in behavioral Engagement can be attributed to the proposed treatment.
3. Ninety-eight percent of the total variance of the experimental group pupils' post achievement in emotional Engagement can be attributed to the proposed treatment.

4. Ninety-five percent of the total variance of the experimental group pupils' post achievement in the total test can be attributed to the proposed treatment.

The previous values show the strong effect of the flipperentiated instruction web-based program on pupils' engagement. This means that the effect of the program is significant. Therefore, the second hypothesis of the study is accepted.

The previous results indicate the fact that using the flipperentiated instruction web-based program helped in improving pupils' vocabulary learning, grammar performance, and their engagement.

**Findings**

The present study revealed the following findings:

1. Using the flipperentiated instruction web-based program was effective in developing EFL primary six pupils' vocabulary learning. This can be assured by these points:
   - The experimental group pupils outperformed the control group pupils in the post vocabulary learning test.
   - The experimental group pupils' mean score in the post-administration of the vocabulary learning test was much better than their mean score in the pre- administration of the test.
2. Using the flipperentiated instruction web-based program was effective in developing EFL primary six pupils' grammar performance. This can be assured by these points:
   - The experimental group pupils outperformed the control group pupils in the post grammar performance test.
   - The experimental group pupils' mean score in the post-administration of the grammar performance test was much better than their mean score in the pre- administration of the test.
3. Using the flipperentiated instruction web-based program was effective in developing EFL primary six pupils' engagement. This can be assured by these points:
   - The experimental group pupils outperformed the control group pupils in the post engagement scale.
   - The experimental group pupils' mean score in the post-administration of the engagement scale was much better than their mean score in the pre- administration of the scale.

**Conclusions**

With reference to the results of the study, the following conclusions were reached:

Using the flipperentiated instruction web-based program has made a dramatic shift in the teaching learning process through turning the classroom into learner-centred rather than being a teacher-cantered one. Having pupils to watch the recorded videos of the lessons at home, do some related learning activities, and get ready to work actively in their groups in the classroom proved to be more effective than receiving direct instruction from the teacher on spot.

Moreover, when students do the activities and the online quizzes at home before they come to class, they are developing their own independence, which could build their confidence in their ability to act independently of the teacher. They became autonomous and active learners. Thus, once pupils come to the class, they are ready to work cooperatively in their groups and with more engagement.

The researcher suggests that flipperentiated instruction web-based program has positive impacts on vocabulary learning, grammar performance, and learner engagement by combining flipped learning and differentiated instruction. By providing differentiated instruction and the flipped classroom model, pupils can have more control over their learning and can engage with the content in multiple ways. Additionally, collaborative and active learning strategies can further increase engagement and promote deeper learning.

For one reason, flipperentiated instruction can provide students with the opportunity to learn vocabulary in a more interactive and engaging way. By using differentiated instruction, teachers can provide different types of vocabulary activities that are tailored to the learning style and level of the student. By watching video lectures outside class, students can be provided with vocabulary lists, definitions, and examples before coming to class. Students can then engage in collaborative learning activities in class that require them to practice using and applying the vocabulary.

In addition, differentiated instruction and flipped classroom models can help students improve their grammar performance. By offering students a variety of activities that cater to individual needs and skill levels, the teacher can provide targeted instruction and practice opportunities. The use of video lectures can also provide students with additional examples and explanations of grammar concepts, which can help to reinforce learning.

Most importantly, the combination of flipped learning and differentiated instruction can increase learner engagement. Students are provided with the opportunity to take control of their learning pace and direction. By watching video lectures outside the classroom, students are more prepared for in-class activities and can participate more actively. Collaborative learning activities, project-based learning, and active learning strategies can also increase learner engagement.

The present study emphasized that the flipperentiated instruction web-based program is effective in enhancing pupils' EFL vocabulary learning and EFL grammar performance. The program also supported pupils' engagement in vocabulary learning and grammar performance.

**Recommendations**

Based on the results and conclusions of this study, the following recommendations were offered:

1. A flipperentiated instruction web-based program is recommended to be used as a framework for enhancing vocabulary learning and grammar performance with primary school pupils.
2. EFL teachers and trainers should make use of the flipperentiated instruction web-based program as a method that could help promote learners' engagement.
3. A flipperentiated instruction web-based program should be applied from the preparatory stage to the secondary stage as well.
4. Teachers should also raise pupils' awareness about the importance of adopting a flipperentiated instruction web-based program from the primary stage to college.

**Suggestions for Further Research**

The following suggestions may be considered for further research:

1. Investigating the impact of flipperentiated instruction web-based program on developing EFL vocabulary learning, grammar performance and engagement of other educational stages such as the preparatory, secondary, and university students.
2. Exploring the effect of flipperentiated instruction web-based program on enhancing other psychological aspects (e.g., self-efficacy).
3. Testing the effectiveness of flipperentiated instruction web-based program on enhancing in teaching other EFL language skills; listening, speaking, reading, and writing.
4. Examining the role of flipperentiated instruction web-based program in other psychological aspects.

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