



عنوان البحث: The impact of the use of inverted education on
the development of some reading skills in English as a
foreign language for high school students in the state of
Kuwait

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The impact of the use of inverted education in the development of some reading skills in English as a foreign language for high school students in the state of Kuwait

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Abstract

The impact of the use of inverted education on the development of some reading skills in English as a foreign language for high school students in the state of Kuwait

This research aimed at investigating the effect of using inverted education on developing some reading skills in English as a foreign language for tenth grade high stage students in Kuwait. A quasi-experimental design was adopted on a sample of (60) tenth grade high school students at "Ajyal Al-Mustaqbal School for Boys", Al Jahra - Kuwait. They were equally distributed into two groups: an experimental group and a control group. The experimental group students were taught using the inverted education, while the control group received regular instruction. Data was collected by an EFL reading test that was administrated before and after the implementation of the treatment. The results revealed that the inverted education had a positive effect on the development of EFL reading skills of high school students.

Key words: Inverted education, EFL Reading skills, High School students



Introduction

Technology figures prominently in education. Nevertheless, educational institutions in general and language teaching, in particular, encounter several challenges in using technological developments or in using these advancements for educational purposes. Technology has become essential for teaching and learning in the 21st century; as it provides teachers and students with access to a variety of educational resources that inspire creativity, enhances students' skills, and helps in transforming the classroom environment into a student-based classroom, as well as their current curricula and instructional strategies to new approaches commensurate to equip today's learner. At the high school level, advanced levels of the English language are introduced with the purpose of motivating students to read for pleasure, to develop creative language skills, and to prepare them to use the language efficiently (Stoffelsma, 2014, p. 22).

There are common characteristics and links among the main language skills (i.e. listening, speaking, reading, and writing); however, they are independent of each other. This means that testing a language skill can provide insights on the general ability of the learner in the other skills, nevertheless, these assessment insights may not provide sufficient indicators about his or her overall proficiency in the language. Thus, the purpose of teaching the English language should be helping learners develop their overall proficiency in the language in order for them to be able to use it in a meaningful way (Skolverket, 2011) .

Reading is an essential language skill for language literacy. It is a skill that has a great influence on the various academic, functional, and mental aspects of an individual. Academically, for instance, reading is a must for being aware of new developments and achievements (Haboush, 2010, P.13) .

Ghilani (2015) states that reading skills can be classified into micro skills and macro skills. He further lists the following skills as being essential micro skills for mastering reading ability: differentiating between distinctive graphemes and orthographic pattern of English; keeping phrases and sentences of various lengths in the working memory; recognizing words and word order patterns and their significance; awareness of grammatical word classes and syntax, and that a particular meaning can be articulated in various grammatical forms; and recognizing cohesive devices in the text and their role in illuminating the relationship between and among clauses (p.10) .

The major reasons behind the poor achievement of students in EFL reading skills are the fact that they are not adequately motivated or allowed the opportunity to engage in the language classroom. In their investigation of the students' perceptions on their poor achievement in EFL/ESL English language classrooms, Souriyavongsa, Ran, Jafar, and Mei (2013) found that the majority of participants believed that insufficient or appropriate education and training of



teachers is a major reason in this respect.

Specifically, teachers could not draw students' attention to make them willing to study. Moreover, students did not have the essential foundation and skills necessary to study the English language course, in addition to their lack of confidence to use the language. The research also revealed that the curriculum was not appropriate to help students learn the language.

Using technology in the English language classroom can help in transforming the educational setting from a teacher-centered environment into a more learner-based and communicative-based environment .

According to the focus of this learner-based environment, the role of both teachers and learners would witness major changes. Teachers will be facilitators who help students by means of scaffolding learning through pre-class assignments, and expanding or deepening learning in class. Moreover, technology would lead to inverting- also referred to as flipping- the classroom, and changing the very nature of the roles of teachers and students. The flipped classroom was originally introduced in 2007 by Jonathan Bergmann and Aaron Sams. Instead of delivering the lecture through the usual face-to-face fashion, the researchers recorded the lectures in advance using appropriate software in order to present them to the students subsequently. (Seville Filiz and Benzet, 2018, p. 72).

Two of the founding principles of inverted learning are active learning and student-centered learning. In the inverted learning approach, the whole process is flipped; students perform their homework assignments inside- rather than outside the classroom. In more details, the class time is devoted to inquiry-based learning, while the main course of the research is conducted in their homes in studying the previously prepared and videotaped lectures by teachers (Baker, 2000, p. 121).

Research in inverted learning has demonstrated the effectiveness of this approach in developing the learning outcomes. Given its potential to provide appropriate feedback to each individual learner, inverted learning can result in enhancing understanding (Bennett and Bergmann, 2012a).

Literature review

- **English language encompasses four main skills that can be classified into two main groups: receptive skills that include listening and reading, and productive skills that include speaking and writing. When students develop receptive skills, vocabulary is obtained from spoken or written text and the context is decoded to understand the text. In EFL classes, reading is one of the four vital capabilities that language beginners need to acquire.**



• Reading

Various definitions have been introduced in literature to define reading. Abu Shamla (2010) looks at reading as a cognitive process of comprehending a written linguistic message and as well as mental representation of the meaning. This means that reading process can be seen as a social and a cognitive activity that involves perception, reflective inquiry, and critical interpretation. It is an active thinking process that places the reader in the place of the creator of the text (Serafini, 2012). Other researchers look at reading as a mechanism to produce viable interpretations of the text and to enable understanding the various perspectives based on the textual sources, the personal experience, the social-cultural intentions, and the intentions of the author (Zin & Eng, 2014).

The above definitions reveal that reading is a technique of extracting the meaning of printed words or verbal symbols in written text. In order to extract the textual content, a reader has to recognize what is being examined through a process that combines the reader's linguistic abilities as well as the previous knowledge to understanding the meaning.

Importance of reading

Reading is a vital process in the endeavor of learning a language. In the attempt to construct a coherent intellectual representation while reading, the reader identifies the form of the textual content, predicts, makes inferences, monitors comprehension and deduces meaning on the basis of his or her previous expertise (Kintsch, 2012).

Reading can be considered a fundamental way to acquire knowledge in any given culture as well as a major asset in the educational settings. Reading plays a complex role in the daily lives of person since it is one of the language skills most widely encountered. A person who is unable to read well is expected to face serious problems, particularly in learning performance (Ganesh, 2015). The importance of reading is not limited to the language classroom; rather it is a pre-requisite for learning any subject matter. This means that learners who have reading difficulties will face many obstacles during their learning.

Levels of Reading

Researchers have made typologies to classify reading skills. According to Koda (2005) and Hudson (2007), there are three main layers of reading skills: literal comprehension, inferential/interpretive comprehension and critical comprehension. The following paragraphs provide brief description of each level.

1. Literal skills

The focus of this basic layer- i.e. literal comprehension- is on decoding explicit information from the text through recognition or recall of its details. Readers- in this lower level of comprehension- can



extract the direct information presented in the text (Romadhoni, 2010). Saadatnia and Tavakoli (2016) define literal reading skills as the basic structure necessary for reading understanding.

2. Inferential skills

Interpretive, also known as, inferential skills include the use of details for the analysis, synthesis and classification of the text-based information, thus enabling the reader to access additional inferential information, which can be extracted from reading between the lines, by mapping the text. This level of reading also enables a reader to identify the major ideas of the text, to draw a conclusion, and to determine the hidden relationships, thus achieving better understanding of the reading text.

Pasbra, Yovanoff, and Tindal (2013) describe inferential reading skills as a shift from primary understanding of the facts extracted from the text to real contact with the text with the purpose of making senses of inferences that may not be obvious in the text.

3. Critical skills

Finally, in the critical comprehension layer, the reader goes beyond the explicit meaning introduced in the text to form an opinion about the quality and accuracy of the text (Ismail, Yusof, Abdul Rashid & Lin, 2015). In this advanced level a reader can evaluate the text by means of critical and creative reading procedures. Readers dynamically elaborate with the text, and are responsive to the processes they use to comprehend anything they read. A good reader, then, is a person who has a drive for reading to look for definite information as well as to read for predilection.

Reading strategies

Reading fluency is the capability of fast and automated word processing, the ability to make general sense and representation of key concepts, and the successful coordination of several mechanisms within limited time constraints. Grabe and Stoller (2002) identify the following as reading strategies: defining a reason for reading, preparing what to do/what steps to take, previewing the text, anticipating the quality of the text or text portion, testing assumptions, asking questions about the text, finding answers to questions asked, linking text to context information, summarizing information, making inferences, connecting information, rereading, guessing the meaning of a new word from context, using discourse markers to see relationships, checking understanding, identifying difficulties, taking steps to fix faulty understanding.

There are various reading strategies that readers use in order to get a better understanding of a text, these include, prior knowledge activation, answering questions and elaborative interrogations, constructing mental images, questioning comparisons, monitoring, previewing,



summarization, knowledge of text structure and grammar, using graphic organizers, re-reading, speed change, and selective reading (Grabe, 2009; Roe, 2009).

EFL Reading Difficulties

Reading skills serve as is significant abilities that can enhance the various language skills. Students sometimes encounter reading difficulties in their first language, thus when they begin learning reading in a second/foreign language, the problem may be compounded by the very nature of the new language being learned. There are several typologies of reading difficulties that focus on precision, understanding, and speed. While other taxonomies devote attention to problems related to cognitive aspects of reading, including lagging behind. (Alsamadani, 2008).

Inverted learning

This section provides a brief overview on inverted education/ learning. The following elements are discussed: the background and the concept of inverted learning; its theoretical background and foundations; its characteristics; the benefits and advantages of using inverted learning; the assessment procedures; the use of inverted learning in foreign language education; and the challenges of using inverted learning.

Background and Definition

Inverted learning can be found in literature under various nominations, including Inverted classroom, inverted learning, inverted education, and flipped learning. In the inverted learning model, the conventional lesson homework becomes the main classwork where students are allowed to get instant commentary and rationalization while attempting to apply the learning material. They have access to the learning material and lectures in their homes by establishing connections with the teachers via the internet. Inverted learning is a way of using academic and technology tools to make the students capable of approaching lessons online and learn according to their own pace (Anderson, 2012).

Inverted learning is a pedagogical approach aimed at transforming the focus of the instructional process from the group learning space to the individual learning space, thus resulting in a more dynamic, interactive learning environment. In this paradigm, the teacher guides students in their endeavors to apply concepts and engage creatively in the subject matter (Piehler, 2014).

The use of online videos to enhance face-to-face instruction can be traced back to Bergmann and Sams (Pink, 2010, p.66). In 2007, Jon Bergmann and Aaron Sams, two science teachers at Colorado's Woodland Park High school, observed that many students wanted to leave before the end of the school day to attend sporting events or other school-related



activities because of the long distance from the school. In their attempt to deal with this issue, Bergmann and Sams recorded the lectures so that the students who had skipped classes can watch them subsequently (Bergmann & Sams, 2012a, p. 66).

In brief inverted learning can be considered as a technique or a method aimed at making better use of the dynamic class time by adjusting the traditional aims as well as the roles of teachers and students, both inside and outside the classroom setting. By inverting the learning process, students can be active participants in the class as they watch pre-recorded lectures provided by the teacher, who acts as a leader or a director, before attending the class at their own pace, thus having the opportunity to take notes and replicate as needed. In the class time, however, students can engage in active learning individually, or collectively, while the teacher's main role is to guide students, facilitate their work, and correct their errors (Sarawagi, 2013).

Theoretical background of Inverted learning:

On the basis of constructivist theory, inverted learning is supposed to enable students to engage in interactive, creative, and collaborative activities during the process of constructing knowledge (Kim & Bonk, 2006). The main characteristic of the inverted learning model is the combination of direct instruction with constructivist learning, which empowers students in studying independently while freeing the class time to teach students to think creatively.

Within the inverted learning model, students would watch pre-class recorded lectures, while in-class time is allocated to discussions, problem-solving, and collective activities related to the subject. Inverted learning model is generally associated with active learning that stems from constructivism. By combining the practices of constructivism (i.e. active, problem-oriented learning practices) with the practices of the behaviorist approach (direct instruction through the face-to-face interaction between the teacher and students in the classroom), this would result in a unique blend of two contradictory learning philosophies. (Pierce & Fox, 2012; Bishop & Vergleher, 2013; Arnold-Gaza, 2014).

Benefits of inverting the learning process

Scholars and educators support the contention that inverting the learning process involves several advantages to students as well as the educational process as a whole. The prospective benefits of inverted learning lie in the following aspects. First of all, learning from taped videos of teachers' delivering lectures provides students with unlimited opportunities to watch the videos as needed (Hamdan et al., 2014, p.64). When a teacher introduces a new content in the traditional classroom, some students may not be able to fully understand the introduced material because of distraction the speed of the teacher, or any other reasons (Hamdan et al., 2013; Tyson, 2010), such as distractions from other students,



school announcements, or the nature of the teacher delivering and how he or she talks (Finkel, 2012 ; Rhor, 2012).

On the other hand, within the inverted learning model each student has several opportunities to watch the teacher's recorded explanation, review and pause the video while taking notes, to reflect on the direct instruction, and to have the time he or she needs, thus enabling him to understand the new content (Hamdan et al., 2013, 68). Moreover, when students are allowed to learn before attending the class, they can determine when and where to study according to their own speed and within their own peace (Tyson, 2010).

The use of inverted learning in foreign language learning

Recently the use of Computer Assisted Language Learning (CALL) has revealed effectiveness in enhancing various language skills, communication skills and student autonomy. The main feature of CALL is its inherent flexibility and potential to make students capable of changing their own learning paces, thus increasing the enthusiasm for and self-confidence in learning (Sheu, 2011).

Literature indicates that the mere use of reading strategies is not sufficient to help students enhance their abilities to read. In order to motivate students to develop higher levels of proficiency within the language learning process, there is a need to establish an adequate learning environment. In this respect the inverted learning model, which transforms the teacher-centered classroom into a student-centered setting, has been proven to be an efficient method to enhance student language learning (Cockrum, 2013).

Challenges of Inverted learning

Despite its promising results, inverted learning faces several challenges and obstacles that may limit, or even compromise, its effectiveness. The accessibility, especially the lack of access to computers or the internet, is one difficulty that teachers encounter in the implementation of inverted learning platforms for students in order to be able to watch the digital videos in homes (Hamdan et al., 2013; Rhor, 2012; Williams, 2012). Bergmann and Sams (2012) suggest come solutions to deal with this problem, such as making videos available in various places and formats, and allowing students to download them to a flash drive or load it on private devices.

Context of the problem

Despite the importance of reading skill for EFL students, the researcher has noticed, out of her work as an English language teacher at a high school in Kuwait for six years, the poor levels of students' reading skills. Students face obvious difficulties in reading mainly due to the teachers' reliance on traditional teaching methods when presenting the content. In addition, surveying teachers' opinions revealed that students cannot understand or read texts properly and cannot fully

understand it. This can be attributed to the following reasons:

- The inability of students to read correctly and that some vocabulary items of English are similar in pronunciation and different in meaning and writing.
- Most high school students have poor reading skills.
- The adoption of the traditional teaching methods by the majority high school teachers in Kuwait, along with the virtual absence of modern educational technologies.
- To document the problem of the research, the researcher conducted a pilot study on 25 students at school in Kuwait in the first semester of academic year (2018-2019) to measure some English reading skills.
- The results of the pilot study showed that the majority of female students had low levels of understanding of reading skills. This was confirmed by the results of the survey which revealed that only 20% of students could provide correct answers. In light of these results, it was concluded that although reading skills were largely referred to in the textbook, there was a lack or complete absence of some English reading skills because they were not implemented by school teachers.
- The results extracted from the pilot study are consistent with those reached by other researchers in their investigations of reading skills (e.g. al-Salami , 2015 , 108; Abdo , 2015; Khoja , 2015; al-Hawamdeh , 2015; Madani, 2016, 5; al-Amri , 2017).

Statement of the problem

The problem of the present research was the poor level of EFL reading skills among tenth grade high school students in Kuwait. In order to address this problem, the present research tried to develop these skills using an inverted learning model.

Questions of the Research:

The current research was an attempt to answer the following questions:

1. What are the EFL reading skills required for high school students in Kuwait?
2. To what extent do EFL High school students master EFL reading skills?
3. What are the features of the inverted learning model?
4. What is the impact of the use of inverted education on the development of some EFL reading skills for High school students in Kuwait?



Hypotheses of the research:

1. There is a statistically significant difference between the mean scores of the experimental and control groups ' mean scores of the overall EFL reading posttest in favor of the experimental group. The first hypothesis has the following sub-hypotheses:
 - A. There is a statistically significant difference at the (0.01) level between the mean scores of the experimental and control groups in the post-administration to the reading skills test (at the Literal Level of reading: read the line) in favor of the experimental group.
 - B. There is a statistically significant difference at (0.01) level between the mean scores of the experimental and control groups in the post-administration to the reading skills test (at the Interpretive Level: read between the lines) in favor of the experimental group.
 - C. There is a statistically significant difference at (0.01) level between the mean scores of the experimental and control groups in the post-administration to the reading skills test (at the Inferential Level: read beyond the lines) in favor of the experimental group.

Significance of the research

This research is important for the following groups:

- 1) For tenth grade high school students in Kuwait: the research can help in developing some of their reading skills; and may encourage them and urge them to learn the language through reading.
- 2) For EFL and teachers of English: the research can encourage them to use modern strategies in learning, including the use of the inverted learning model in their teaching process. Also, Practitioners may benefit from this research by understanding some of the critical educational issues of inverted learning.
- 3) For EFL researchers this research may contribute to positive change in education as it provides research-based learning foundations for inverted learning.

Aim of the research

The aim of the research was to investigate the impact of inverted education on the development of some EFL reading skills for high school students in the state of Kuwait.

Limitations of the research



This research was limited to the following:

- 1) A sample of sixty tenth grade high school students at Ajyal Al-Mustaqbal School for Boys School at Al Jahra – Kuwait.
- 2) Some EFL reading skills required high school students in Kuwait.
- 3) The first semester of the academic year (2020-2021).

Instrument and materials of the research

The researcher has prepared and used the following instrument and materials:

- 1) An EFL reading skills checklist.
- 2) An EFL reading test.
- 3) A teacher's guide.

Participants of the research

The Participants of the present research were 60 male high school students. They were chosen randomly from tenth grades enrolled in "Ajyal AL-Mustaqbal School" during the first semester of the academic year 2020/2021. They were equally distributed into two groups: an experimental group and a control group.

Design of the research

A quasi-experimental approach (a Control Group Pre-test/Post-test Design) was employed in this research. The experimental group students were taught within an inverted classroom, while the control group students were taught through the usual method. Both groups were pre and post tested.

Operational definitions:

EFL reading skills

EFL reading skills are operationally defined as high school students who read a text and understand it at various levels; literal, interpretive and inferential.

Inverted learning

Inverted learning is a mode of blended learning that involves employment of technology to influence EFL learning. It is a method used to deliver instruction online outside of class and move 'homework' into the classroom, where students can discuss the topic in-depth.

Procedures

Instruments and Materials of the research:

The following instrument and material were used:

1. An EFL reading skills checklist:

An EFL reading skills checklist was developed to determine the appropriate reading skills required for to high



school students in the state of Kuwait. The checklist included in its first version 12 reading skills under the following three main categories (first version):

1. The Literal level: contained 4 sub skills.
2. The Inferential level: contained 4 sub skills.
3. The Inferential level: contained 4 sub skills.

Validity of the checklist:

The reading skills checklist was submitted to 11 jury members of the experts of English language teaching and science and technology. They were asked to review the sub skills in terms of their appropriateness to Kuwaiti high school students. The juries reduced the number of sub skills to 9 instead of 12. Some items were deleted and others were moved from a certain level to another (final version).

2. The EFL reading skills Test:

An EFL reading test was developed to measure some EFL reading skills among high school students at the Ajial Al Mustakbl International School.

The Test Construction

The test was developed to measure 3 reading skills (reading the text and understanding it at the literal, interpretive and inferential levels). The test consisted of 4 main questions containing 27 items that covered the various reading levels. Each of the three levels was covered by 9 items. The total score of the test was 27 marks.

Validity of the reading test

Having developed the reading skills test, it was submitted to a set of 11 jury members specialized in TEFL. They were asked to examine the test for clarity and readability, as well as whether it tests what it was designed for. The jury members approved the test in terms of validity.

Internal consistency of the test

The internal consistency of the test was verified by calculating the Pearson correlation coefficient between its items, and the total score of the test. The resulting ratio was (0.842), which indicates significance at the level (0.01). Thus, all the values of the correlation coefficients were positive and high, which indicates the internal consistency between the scores of the items, and the overall degree of the test.

Test specifications

Table (1): Test specifications

Levels	Skills	Number of questions	Relative weight
	1. Scan text for specific information (scanning skills questions)	1-10 - 11	11.11%

Literal Level (read the lines).	2. Skim for the gist or general impression of text graphics(skimming skills)	4- 8 - 9	11.11%
	3. Reading meaning and recognition skills	2-3- 15	11.11%
Interpretive Level (read between the lines).	4. Identifying the author's purpose and tone skills.	6 -13 - 17	11.11%
	5. Retell or summarize reading text	7- 12- 14	11.11%
	6. Determine whether the ideas are true or false	23 – 24 - 25	11.11%
Inferential Level (read beyond the lines).	7. Make predictions about reading text	5-21 - 22	11.11%
	8. Indicating cause- effect relations	16-19 -20	11.11%
	9. Deduce meaning of information words using context	18 – 26 – 27	11.11%
		27	100

Results presented in table (1) show the distribution of scores of the reading test questions. After identifying the main skills and sub-skills of the test, the scores of the questions were distributed according to sub skills table.

Reliability of the Test:

The reliability of the test was calculated using the Alpha Cronbach's coefficient. SPSS statistical software was used. The result of Alpha Cronbach's Alpha reliability coefficient was (0.789), which indicates the reliability of the test. Table 2 presents the alpha ratios for the reading test.

Table (2): Reliability of the reading test.

Reading Levels	Cronbach's Alpha	Significance
Literal Level (read on the lines).	0.823	0.01
Interpretive Level (read between the lines).	0.761	0.01
Inferential Level (read beyond the lines).	0.785	0.01
Total	0.789	0.01

*Significance at 0.01

Results presented in table (2) show that the values of Alpha Cronbach for the reading skills test for tenth grade students, as well as for the test as a whole were high.

Test piloting

The EFL reading test was administrated to fifteen tenth grade students at the Ajial Al Mustakbl International School of the nonparticipants of the main research in order to investigate its readability and timing. The timing of the test was 40 mins.

To calculate the ease and difficulty coefficients, the researcher calculated the easiness and difficulty of the test and arranged them according to the degree of its easiness. It was found that the easiness



coefficients ranged between (0.8) and (0.2), which is a value representing the permissible range in these tests. Moreover, the simplicity and difficulty of the test questions and the clarity of test instructions were verified.

Administrating the reading skills test

The EFL reading test was pre-administrated on 31 October 2020, while the post-administration to the test was conducted on 26, 27 November 2020 during the first semester of the academic year 2020-2021.

3. Materials: the inverted Learning Environment

The ADDIE model, which is an acronym for the five stages of the development process: analysis, design, development, implementation and evaluation, was relied upon in designing the inverted learning environment. The ADDIE model was developed in the 1970s and is still one of the most commonly used models for instructional design. The reasons behind the use of the ADDIE model were its simplicity, effectiveness, and the possibility to be adapted to a variety of learning environments including the inverted learning. It is also relatively easy to identify the different stages of its use.

The ADDIE model relies on each stage performed in the specified order, but with an emphasis on reflection and repetition. The following paragraphs illustrate the steps of the model:

3.1 The analysis phase:

This phase included a set of steps that have been implemented as follows:

- A. Analysis of the status.
- B. Identifying needs.
- C. Defining the targeted group and its characteristics.
- D. Content analysis.
- E. Analyzing resources and constraints in the educational environment.

Thus, the researcher identified the required topics to be taught through the inverted learning environment (see figure 1).



Figure (1): module topics in an inverted environment.

3.2 The design phase:

In this phase, the identification, development and evaluation of the planned strategies that should be employed in the inverted learning environment were completed. This phase included the following:

- Defining the general objectives for the content of the inverted learning environment.
- Defining the behavioral goals of the program.
- Organizing the content of the inverted learning environment.
- The teaching strategies used in the inverted learning environment.
- The learning activities.
- Designing activities for the inverted learning environment.
- Inverted education environment scenario design.
- Designing measurement tools for the inverted learning environment.

Using appropriate strategies to the inverted learning environment, interaction was planned to occur on one-to-one basis, collectively and participatory in order to develop EFL reading skills among the participants.

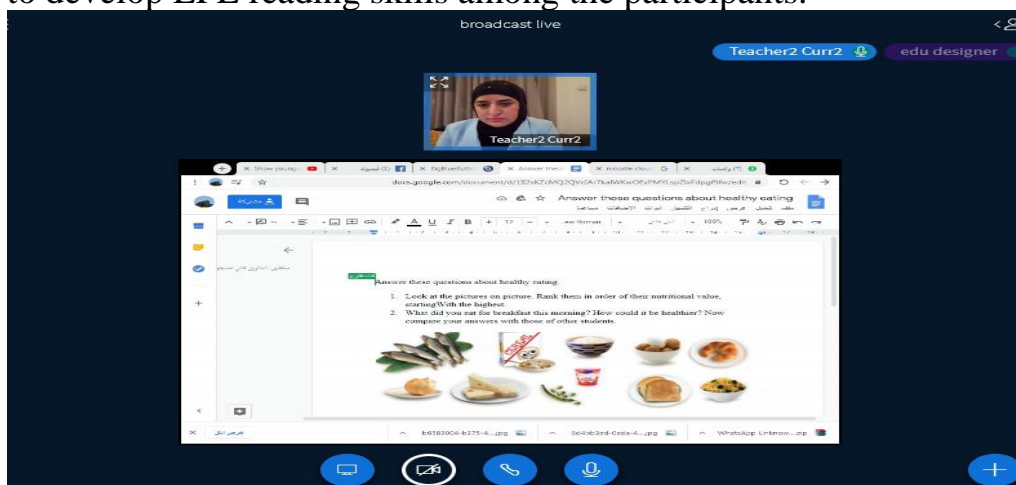


Figure (2): Interaction through the inverted learning environment platform

3.3 The development phase

The development phase started with the production, testing, and identification of the method used in the program. At this phase, the researcher used the data collected in the previous phases in the design of the inverted learning environment in order to achieve the desired outcomes. This phase included the following steps:

- Selection of the team to produce and define responsibilities and management in the designed environment.
- Identifying the sources and describing their components and elements in the inverted learning environment.
- The selection of the elements and presentation using the inverted learning environment.
- Defining the material and requirements of the human production.
- Developing a production plan and a timetable.
- Adding graphics.

3.4 The implementation phase

This phase included the following steps:

- ❖ Establishment of the inverted learning environment.
- ❖ Production of inverted education environment components.
- ❖ The use of interactive boards on the platform.

The classroom was set to allow live and direct presentation through the platform to carry out the pre-planned educational activities. The results were record to achieve better understanding of the content, and to monitor and evaluate the learning occurring during the session.

3.5 The evaluation phase

This phase included formative evaluation during the sessions and summative evaluation that took the form of post-testing students on their reading skills.

4. Teacher's Guide

The researcher developed the unit to be delivered through an inverted learning environment. The guide included the aims and objectives, the teaching strategies that can be used in implementing the lessons, presentation of the unit's lessons and how they are implemented, and presentation of the reading skills included.

5. Experimental Procedures

5.1 The experimental treatment took four weeks (from Saturday, October 31, 2020 to Thursday, November 26, 2020), three sessions a week. The experimental group students were taught through the

inverted learning model. The instrument of the study (the reading comprehension test) was pre-administrated before the intervention, followed by implementing the inverted learning intervention for 14 lessons.

5.2 Choosing the place of conducting the experiment, And the administration of the reading skills pre-test.

5.3 Teaching the reading sessions.

5.4 The post administration of the reading Posttest.

6. Data Analysis

6.1 The researcher confirmed that the students read the test instructions well. She responded to their inquiries within the limits of the instructions written at the beginning of the test. The actual time for answering the achievement test as a whole amounted (40) minutes.

6.2 After administrating the pre-test, the students' scores were coded, and those who obtained more than 35% were excluded, Thus, the total number of students became (60) students. They were divided into two groups, an experimental group and a control group. Table (3) shows the homogeneity of the both groups in the pre-test.

Table (3): Homogeneity of both groups in the pre-test

Measurement	Group	N	Mean	S.D	DF	t-Value	Sig
Pre-measurement for the first level	Experimental	30	1.90	0.96	58	0.960	Not sig
	Control	30	1.67	0.92			
Pre-measurement for the second level	Experimental	30	1.57	0.57	58	0.961	Not sig
	Control	30	1.43	0.50			
Pre-measurement of the third level	Experimental	30	1.63	0.67	58	0.653	Not sig
	Control	30	1.53	0.51			
Pre-measurement (total)	Experimental	30	5.10	1.12	58	1.562	Not sig
	Control	30	4.63	1.19			

Results presented in table show that there are no statistically significant differences between the two groups in the pretesting. This means that any changes occurring in students' reading skills levels can be attributed to the treatment used.

6.3 The experimental treatment was implemented on the experimental group treatment according to the following procedures:

- The researcher introduced brief explanation on inverted learning and its goals. This explanation was also in written form, so that students could review the material.
- The posttest was administrated after completing the experimental treatment.
- The researcher then conducted the statistical analysis for the results obtained.

Findings and discussion

The researcher provided the results of the research after applying the research steps and procedures. For this aim, the researcher answered the research questions, verified their hypotheses, discussed and interpreted these results.

1. Findings

This section dealt with the findings in terms of the research hypotheses.

1.1 Verifying the first hypothesis

The first hypothesis stated that "there is a statistically significant difference at (0.01) level between the mean scores of the experimental and control groups in the post-administration of the overall EFL reading test in favor of the experimental group.

The following table presents the participants' mean scores, standard deviation, t-value and level of significance in the post-administration of the EFL reading test.

Table (4): The Participants' mean scores, standard deviation, t-value and level of significance in the post-administration of the EFL reading test

Measurement	Group	N	Mean	S.D	df	t-value	Sig
Post-measurement	Experimental	30	25.00	1.11	58	29.402	0.01
	Control	30	15.47	1.38			

The previous table indicated that the mean scores of the research participants of the experimental group are higher than the mean scores of the participants of the control group. In addition, t-value is 29.402 which is significant at the (0.01) level. Consequently, the main hypothesis of the research was confirmed. The findings of the first research hypothesis are consistent with the findings of some other researcher that aimed at developing EFL reading skills as Girmen (2019); Kawinkoonlasate (2019); Chang (2020); Fahmi (2020).

1.2 Verifying the first sub-hypothesis

The first sub-hypothesis stated that "There is a statistically significant difference at (0.01) level between the mean scores of the experimental and control groups in the post-administration of the literal level of reading in favor of the experimental group". The following table presents the participants' mean scores, standard deviation, t-value and level of significance in the post-administration of the literal level of reading.

Table (5): The Participants' mean scores, standard deviation, t-value and level of significance in the post administration of the literal level of reading

Measurement	Group	N	Mean	S. D	DF	t-value	Sig
Post-measurement	Experimental	30	8.20	0.61	58	16.278	0.01
	Control	30	4.63	1.03			

The previous table illustrated that the mean scores of the research participants of the experimental group are higher than the mean scores of the participants of the control group in the post-administration of the literal level of reading. Accordingly, the first sub-hypothesis of the research was confirmed.

1.3 Verifying the second sub-hypothesis

The second sub-hypothesis stated that "There is a statistically significant difference at (0.01) level between the mean scores of the experimental and control groups in the post-administration of the interpretive level of reading in favor of the experimental group". The following table presents the participants' mean scores, standard deviation, t-value and level of significance in the post-administration of the interpretive level of reading.

Table (6): The Participants' mean scores, standard deviation, t-value and level of significance in the post-administration of the interpretive level of reading

Measurement	Group	N	Mean	S. D	DF	t-value	Sig
Post-measurement	Experimental	30	8.57	0.50	58	22.593	0.01
	Control	30	5.43	0.57			

The findings of table (6) have clarified that the mean scores of the research participants of the experimental group are higher than the mean scores of the participants of the control group in the post-administration of the interpretive level of reading. Further, t-value is 22.593 which is significant at the (0.01) level. Thus, the second sub-hypothesis of the research was confirmed.

1.4 Verifying the third sub-hypothesis

The third sub-hypothesis stated that "There is a statistically significant difference at (0.01) level between the mean scores of the experimental and control groups in the post-administration of the inferential level of reading in favor of the experimental group". The following table shows the participants' mean scores, standard deviation, t-value and level of significance in the post-administration of the inferential level of reading.

Table (7): The Participants' mean scores, standard deviation, t-value and level of significance in the post-administration of the inferential level of reading

Measurement	Group	N	Mean	S. D	DF	t-value	Sig
Post-measurement	experimental	30	8.23	0.68	58	16.214	0.01
	Control	30	5.40	0.67			

The findings shown in table (7) have indicated that the mean scores of the research participants of the experimental group are higher than the mean scores of the participants of the control group in the post-administration of the inferential level of reading. Further, t-value is 16.214 which is significant at the (0.01) level.

Hence, the third sub-hypothesis of the research was confirmed.

2. Discussion of the research findings

The findings of the first (main) hypothesis revealed that there was a statistically significant difference at (0.01) level between the mean scores of the experimental and control groups in the post-administration of the EFL reading test in favor of the experimental group. This development in EFL reading skills at its three levels (literal, interpretive and inferential) as illustrated previously was related to the application of inverted education strategy. These results have revealed that inverted education had a positive impact on developing EFL reading skills of tenth-grade high school students in the State of Kuwait, and these results were consistent with the results of some studies such as the study of Girmen (2019); Kawinkoonlasate (2019); Chang (2020); Fahmi (2020) that have emphasized the importance of integrating recent pedagogical methods, techniques and strategies as (inverted education strategy) to develop EFL reading skills. Inverted education is useful in maximizing practice time for students and creating a positive learning atmosphere that enhances students' motivation towards reading. It provides and supports EFL reading classes with:

1. Time for working in collaborative groups, utilizing school technology and applying knowledge in exercises and experiments.
2. Attractive and electronic reading materials which are highly associated to the community of the students.
3. Interactive educational videos that were presented before and after presenting the new reading materials of the lessons.
4. Out of class electronic reading tasks and activities.
5. The diversity of learning resources as, the digital resources that are represented in online and offline learning platforms.
6. Personal coaching time for enhancing (teacher-student) interaction.

3. Recommendations

Based on the results of the current research, the following are the recommendations were suggested:

- a) Inverted education strategy should be implemented in teaching EFL reading skills to high school students.
- b) The Ministry of Education should apply inverted education as an effective teaching method that is related to e-learning environment to develop the four main language skills.
- c) Providing training workshops at the Ministry of Education in the State of Kuwait for teachers to help them apply new pedagogical approaches and



strategies as inverted education in EFL classes.

4. Suggestions for Further Research

Based on the findings of the recent research, the following implications can be suggested for further research:

- ❖ Investigating the impact of inverted education strategy on developing EFL reading skills for primary and preparatory levels.
- ❖ Investigating the impact of inverted education strategy on developing EFL listening skills.
- ❖ Investigating the impact of inverted education strategy on developing EFL writing skills.

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عنوان البحث: The impact of the use of inverted education on the development of some reading skills in English as a foreign language for high school students in the state of Kuwait

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