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The Effect Of Artificial Intelligence Application On Jordanian Efl Sixth-Grade Students' Listening Comprehension And Their Attitudes Towards It

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Abstract

This study aims to investigate the effect of Artificial Intelligence on Jordanian EFL sixth-grade students' listening comprehension and their attitudes towards it. This research has adopted A quasi-experimental approach which includes both an experimental and a control group (a quantitative study). The materials that are used in this study consist of All listening activities that have been extrapolated in the Student's Book and Activity Book of Action Pack 6 in units (8, 9, 10, 11,12,13and 14). There are two sixth-grade sections in Hai Al-Amir Hassan Elementary Mixed School. One group was randomly (by tossing a coin) allocated as control (33 students), while the other was experimental (32 students) (32 students). The participants were all female and from similar social and academic settings. To achieve the aim of the study, a listening pre-post test was designed. The results showed that the experimental significantly scored higher than the control group in the three and overall levels of listening comprehension. The findings suggested that using Artificial intelligence effectively enhances EFL learners' listening. The study recommended using Artificial intelligence to improve students' listening comprehension.

Keywords: Artificial Intelligence (AI), and Listening comprehension.

Introduction

To learn English, four primary skills: reading, listening, speaking, and writing. Swanson (1996) emphasized listening as important language skill. According to Howatt and Dakin (1974), listening is the facility to recognize and understand what is being said by others. Furthermore, it is essential in language learning because it offers input for students. Without listening skills, no communication or interaction can be reached (Rost, 1994).

Listening, the focal point of this study, is of great significance as it emerges initially in natural language learning and is used practically all the time (Flowerdew & Miller, 2005). According to Lawson (2007), humans spend 80% of their waking hours interacting with at least 45% listening time. As a result, listening is prioritized over other skills like reading, speaking, and writing. Research (e.g., El-Sagheer & Levine 2002;Krashen,1989 p 4) indicates that listening to comprehensible input can support language acquisition.

Learning has been made more accessible and more effective with the use of technology in worldwide. Digital tools have been embraced by educators and have become a crucial aspect of classroom education in recent years (Fullan, 2013).AI is one of the recent technological advancements. It is defined as the art of constructing computers capable of thinking and acting like humans; or thinking and acting

suitably (Norvig & Russell 2010). Reiland(2017, p 3) that it "depicts computerized systems that reenact cognitive capacities associated with the human personality, for example, learning and critical thinking" (2017, p 3).

What is more, AI refers to computer science and machines that develop intelligence, such as humans (Suryana et al., 2020; Almutairi, 2020; Bozkurt & Goksel, 2019). Through this technique, machines do several simples to advanced tasks that people often do. AI systems can save human efforts in all fields (Goksel & Bozkurt, 2019). For instance, a smartphone is a convenient and practical example of how people can use artificial intelligence (Almutairi, Gegov, Adda, & Arabikhan, 2020). Also, individuals are driving on the roads for long-distance with the assistance of GPS. In utilities, individuals can easily predict what spellings should be written and corrected. In the economic field, AI can be utilized in the following: algorithmic trading, business analysis, private finance, and underwriting (Tadapaneni, 2020).

Question of the Study

In order to achieve the objective of the study, the following question is addressed: "Are there statistical significant differences in Jordanian EFL students` listening comprehension due to the instructional method (AI vs. conventional)?"

literature review

After conducting a literature analysis on educational research, the researcher gathered previous papers that were pertinent to this study.

Gary (1978) defined listening as an active and complex process in which listeners' skills can be improved by providing nonverbal tasks to complete orally. Moreover, Vandergrift (1999) confirmed that listening comprehension is noted as a multifaceted and active process that is impressed by several factors, including the distinction of sounds, understanding the vocabulary and the syntactic constructions, recognizing the stress and intonation, and immediately interpreting it and the broader socio-cultural context of the speech as well.

There are two fundamental cognitive processes related to listening comprehension skills: bottom-up processing and top-down processing. These two procedures come together to form interactive processing. Consequently, there are three different kinds of listening models. The first kind of model is bottom-up processing is motivated by the new incoming data, while the second kind (top-down) is motivated by knowledge-driven (Gilakjani & Ahmadi, 2011).

Rifkin (1995) described AI as the art of designing machines that can execute tasks that would require intelligence done by humans. Russell and Norvig (2003:31) defined AI as "machine intelligence, or computational intelligence, that embraces various subfields wherein learning takes place and specific tasks," such as proving mathematical statements, writing verse, and disease detection. Furthermore, Jia (2009) stated that AI is an intelligent computerized machine that can naturally create a discussion between humans and machines. To Russell and Norvig (2016), the AI can be defined as computer programs eligible for running intelligent tasks.

Artificial intelligence has a wide range of applications, including expert systems, logical reasoning, games, knowledge representation, learning, robotics, image vision, writing and speech recognition, person-machine interaction, understanding natural languages, multi-talented systems, planning de-constraints, linguistics Computing, neural networks, and others (De Kleijn, Siebert, & Huggett, 2017).

Kim (2019) looked at the impact of AI chatbots on the English grammar skills of Korean college students. The sample of the study contained 70 undergraduate students. Two groups of students were created. Grammar was taught to the experimental group utilizing the Replika app over the conversation. The other group learned grammar skills by conversing with their partner. Tools used to gather the data were pre-test and post-test to explore changes in the participants' grammar skills. The findings revealed that AI chatbots improved Korean learners in learning a foreign language.

Junaidi, Budianto, Kenny, Fathu, and Tatum (2020) measured the effectiveness of artificial intelligence applications in the English language as a classroom environment for teaching English as a foreign language. The AI application engaged in this experimental study is Lyra Virtual Assistant (LVA). The study sample was 65 seventh-grade students divided into experimental and control groups. The instruments used in the study were two pre-posttests of EFL speaking skills: pronunciation, grammar, vocabulary, and fluency. As a result of the study, the experimental group that employed LVA achieved a substantial result in the post-test. Consequently, VA is a useful AI tool for EFL students looking to enhance their speaking skills.

Aljohani (2021) investigated the attitudes of EFL teachers and students in Saudi Arabia on the use of artificial intelligence (AI) to improve English language learning. The sample consisted of 19 teachers and students from Yanbu University. The instruments used were questionnaires to gather the data. The findings revealed that teachers' and students' opinions had substantiated the impact of AI on teaching English in Saudi Arabia.

Putri and Islamiati (2018) investigated whether or not utilizing Duolingo in English learning dramatically enhances students' listening abilities. The study participants were 39 students from different classes. A pre-posttest was used to find out whether using Duolingo apps enhances students' listening abilities. According to the study's findings, utilizing Duolingo Applications can increase students' listening abilities and make the teaching list attract students to learn English.

Method

A quasi-experimental approach was used in this investigation, which included both an experimental and a control group (a quantitative study). Sixty-five sixth-grade EFL students were allocated into two intact sections at Hai Al-Amir Hassan Elementary Mixed School in the northern Jordan Valley, a public school administered by the Irbid Directorate of Education, during the second semester of the school year 2021–2022. There are two sixth-grade sections in this school. One group was randomly (by tossing a coin) allocated as control (33 students), while the other was experimental (32 students) (32 students). The participants were all female and from similar social and academic settings. All listening activities have been extrapolated in the Student's Book and Activity Book of Action Pack 6 in units (8, 9, 10, 11,12,13and 14) by mapping and identifying the listening activities to find out the number and percentages.

The listening comprehension reliability test:

The critical reading exam was truly tested in a pilot study with 32 students, all of whom were later removed from consideration for inclusion in the sample for the main study. This was done to establish the test's dependability. We utilized the test-retest strategy with a gap of 2 weeks throughout each round. Table 1 presents the findings in tabular format.

Cronbach Alpha coefficients and test-retest correlations for each reading level of understanding and the overall critical reading test are presented in Table 1.

Reading Sub-skill	Alpha Coefficient	Test-retest Coefficient
Literal	0.71	0.83
Critical	0.76	0.80
Inferential	0.74	0.81
Overall	0.79	0.85

In Table 1, the literal, critical, and inferential Cronbach Alpha Coefficients were 0.71, 0.76, and 0.74, respectively. The full scale was determined to be 0.79, which is over the cutoff limit. 70 (Cronbach, 1951). In addition, the test-retest coefficients for the literal, critical, and inferential questions were 0.83, 0.80, and 0.81, respectively. The full scale was determined to be

0.85, which is over the cutoff limit. 70 (Cronbach, 1951).

Result and Discussion

The question of the study reads: "Are there statistical significance differences () in Jordanian EFL students` listening comprehension due to the instructional method (AI vs. conventional)?"

To answer this question, the following procedures were conducted:

1. The pupils' general phonological awareness levels were analyzed, and their standard deviations were calculated.

The following examples can be found in Table 2:

The total levels of listening on the pre-test and the post-test, along with their respective analysis of variance, are presented in Table 2 below.

Dependent variable	Group	Pre-test		Post-test	
		Mean*	Std.	Mean*	Std.
Overall	Control	20.2727	4.99545	37.0303	4.18692
	Experimental	20.9063	4.22252	28.1875	3.09461
	total	20.5846	4.60602	32.6769	5.76657

*__The maximum score is 50 for the entire scale.__

According to Table 2, the average score just on the total post-test for the test group was 37.03, while the average score for the comparison group was 28.19. This suggests a difference between these two groups in terms of the overall listening performance post-test, with the initial study coming out on top.

After correcting for the effect that overall pre-test scores had on the data, a one-way analysis of covariance (ANCOVA) was carried out in order to evaluate whether or not the instructional method had a statistically significant impact on overall levels of phonemic awareness. Table 3 presents the findings in tabular format:

Table 3 presents the data of just one ANCOVA that was performed to determine the effect the teaching approach had on collective comprehension

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Pre-test	151.389	1	151.389	13.286	.001	.176
Teaching Strategy	1325.631	1	1325.631	116.340	.000	.652
Error	706.456	62	11.394			
Total	71534.000	65				
Corrected Total	2128.215	64				

It can be seen in Table 3 that the median score of post-test for overall reading and listening levels is noticeably higher than the results of the treatment group. This is the case when compared to the intervention class. According to the value of the partial eta squared, which was 0.652, the teaching strategies were responsible for explaining 65.2 percent of the overall variance in the levels of listening comprehension. Therefore, it is plausible to assert that the implementation of the AI teaching technique resulted in improved levels of listening on the part of the students.

In addition, the adjusted and uncorrected means of the total listening comprehension levels of the experimental and control groups were determined. Table 8 presents the means, standard

errors, and standard deviation of the overall students' listening levels of something like the experimental groups before and after correcting for the pre-test results.

Table 4 displays the adjusted and adjustments group as well as the variability of general listening levels based on pre-test scores as a covariate for each style of instruction.

Group	Unadjusted Means		Adjusted Means	
	Mean	S.E	Mean	STD
Control	37.03	4.19	37.14	.588
Experimental	28.19	3.09	28.08	.597

After taking into account the variations in the participants' education scores, Table 4 shows that there is almost certainly a distinction in the overall levels of comprehension between the experimental groups. Therefore, it is possible to conclude that the (AI) teaching technique increased overall levels of word recognition demonstrated by the learners.

2. The mean scores of the educators' listening levels (literal, inferential, as well as essential ability to comprehend levels) in the experimental groups across the three listening comprehension levels and subshells were extracted. This was done for all three listening comprehension levels and sublevels. The following examples are provided in Table 5:

Table 5 contains the mean scores of the pupils' comprehension (tiers and sub-levels) in the pre-test and the comment according to the Teaching method.

level	Sub-level	Group	Pre-test		Post-test	
			Mean *	Std.	Mean *	Std.
Literal	Follow oral instruction (S1)	Experimental	3.52	1.80	6.36	1.54
		Control	3.25	1.74	5.38	1.13
	Respond to question after listening (S2)	Experimental	4.00	1.41	7.58	1.98
		Control	4.31	1.97	5.22	1.74
	Total	Experimental	7.52	2.45	13.94	2.89
		Control	7.56	2.20	10.59	2.00
Critical	Use context to understand new words when listening (S3)	Experimental	4.21	1.76	7.03	1.42
		Control	4.34	1.64	5.88	1.21
	Summarizing (S4)	Experimental	2.15	.91	3.88	.74
		Control	2.38	.87	3.50	.76
	Total	Experimental	6.36	2.06	10.91	1.49
		Control	6.72	1.75	9.38	1.50
Inferential	Predicting (S5)	Experimental	4.00	1.84	7.82	1.53
		Control	4.22	1.74	5.03	.93
	Make simple inferences when listening (S6)	Experimental	2.39	1.17	4.36	.90
		Control	2.41	1.19	3.19	.74
	Total	Experimental	6.39	2.54	12.18	1.83
		Control	6.63	2.59	8.22	1.18

* **The highest possible score is 20 points for literal, 15 points for inference, 15 points for critical, 8 points for S1, 12 points for S2, 10 points for S3, 5 points for S4, 10 points for S5, and 5 points for S6.**

According to what is presented in Table 5, the mean scores for hearing comprehension obtained by the treatment group are superior to the mean scores obtained by the control group across all three tiers and sub-levels of listening comprehension. It was discovered that the students had a mean score of 13.94 on the physical plane, 10.91 on the inference level, and 12.18 on the dangerous level, respectively. On the other hand, the students who were assigned to the control group had a mean score of 10.59 on the primitive level, 9.38 on the inference level, and 8.22 on the critical level. This suggests there are variations between the two groups in terms of teaching listening levels and sub-levels comment, with the research group coming out ahead in terms of these comparisons.

A One-way Multi - variate Ancova (One-way MANCOVA) using an Univariate Test (Hoteling's Trace exam) has been used to evaluate the effects of the instructional method on the sequential combination of three listening levels (i.e., literal, inferential, and critical) after covariate adjustment. This was done to investigate whether the teaching strategy had a statistically significant effect on the piecewise mixture of three students' listening levels (literal, Table 6 exhibits MANCOVA results.

The impact of the instructional method on the linear mixture of three degrees of language learning is presented in Table 6.

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Teaching Strategy	2.670	51.613	3.000	58.000	.000	.727

In Table 6, the primary effect of a method of instruction was important, and it had a big impact factor; Hoteling's Trace test = 2.670, F (3, 58) = 51.613, p.001, and Multimodal eta square = 0.727. These numbers represent the significance and the effect size, respectively. It may be deduced from this that the linear combination of the three levels of phonological awareness (literal, inferential, and critical) is different for the experimental group compared with the control. The partial eta square value of 0.727 shows that the Artificially Intelligent paradigm could be ascribed to 72.7 percent of the variance in the composites of the three tiers of phonological awareness (literal, inferential, and critical) (AI).

Touch base statistical tests, also known as tests of somewhere between effects, were carried out to analyze the specific differences seen across all three levels of reading comprehension from both groups (Severally). The findings are shown in Table 7, which includes:

Table 7 displays the results of a follow-up multivariate analysis (intraclass effects) on the three levels of comprehension skills (severally) after the influence of pre-test scores has been controlled for.

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre-Literal (covariate)	Literal	.077	1	.077	.014	.907	.000
	Critical	15.351	1	15.351	10.707	.002	.151
	Inferential	1.073	1	1.073	.496	.484	.008
Pre-critical (covariate)	Literal	55.648	1	55.648	9.983	.002	.143
	Critical	.437	1	.437	.305	.583	.005
	Inferential	19.278	1	19.278	8.914	.004	.129
Pre-Inferential (covariate)	Literal	1.578	1	1.578	.283	.597	.005
	Critical	26.243	1	26.243	18.304	.000	.234
	Inferential	.387	1	.387	.179	.674	.003
Teaching Strategy	Literal	198.104	1	198.104	35.539	.000	.372
	Critical	40.623	1	40.623	28.334	.000	.321
	Inferential	266.746	1	266.746	123.337	.000	.673

Error	Literal	334.457	60	5.574
	Critical	86.024	60	1.434
	Inferential	129.764	60	2.163
Corrected Total	Literal	573.446	64	
	Critical	178.462	64	
	Inferential	405.538	64	

Table 7 demonstrates a statistically important gap between the pupils in the experimental and control classes across all three levels of listening comprehension (literal, inferential, and critical). Consequently, students who were part of the test group achieved considerably higher scores on all three levels of comprehension than their peers who were in the type control group (literal, critical, and inferential). The partial eta squared values of listening at the basic, analytical, and causal inference stages were 0.372, 0.321, and 0.673, respectively. This indicates that the instructional technique explained correspondingly 37.2% of the variance in literal comprehension levels, 32.1% of the variance in critical literacy levels, and 67.3% of the variance in inferential understanding levels. In addition, both the corrected and uncorrected means of the experiment group were determined. Table 8 presents the findings in tabular format.

Table 8 presents the modified and uncorrected group means as well as the variance of the hearing technique based on the use of pre-test scores as confounders.

Reading comprehension levels	Group	Unadjusted Means		Adjusted Means	
		Mean	S.E	Mean	Std
Literal	Experimental	13.94	2.89	14.02	.412
	Control	10.59	2.00	10.51	.418
Critical	Experimental	10.91	1.49	10.93	.209
	Control	9.38	1.50	9.34	.212
Inferential	Experimental	12.18	1.83	12.23	.257
	Control	8.22	1.18	8.16	.261

Table 9 displays the averages, standard errors, and margins of error of the test group's and the controlled group's understanding in the three levels of comprehension (literal, critical, and causal inference) both before and after the effect of pre-test scores were controlled for. As can be seen from table 11, almost all of the disparities that existed seen between the experimental group and a control group are still present after the variations in pre-test scores have been adjusted for. As a result, the artificial intelligence (AI) teaching method improved students' overall performance across all three levels of listening comprehension (literal, critical, and inferential). As a result, students' overall performance improved across all three sub-levels of phonological awareness when the AI teaching style was used.

3. A One-way Multivariate ANCOVA (One-way MANCOVA) using a Multivariate Exam (Hoteling's Trace test) was carried out in order to observe the impact of the teaching method (using AI) on the various sub of phonemic awareness (Follow oral guidance, Respond to ask after having to listen, Use the background to understand the new phrases once listening, Summarizing, Predicting, and Make simple conclusions when listening). Table 10 presents the findings in graphical form.

Table 10 shows how the different teaching strategies affect the linear model of the six different sub-levels of phonological awareness.

Effect	Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared

Teaching strategy	4.371	37.882	6.000	52.000	.000	.814

In Table 10, the primary effect of the instructional Strategies was substantial, with a big effective dose; Hoteling's Trace test = 4.371, F (6, 52) = 37.882, p.01, and Multimodal eta square = 0.814. These numbers indicate that the effect had a considerable effect. This suggests that the experiment and the control subjects vary on the sequential matrix of the six listening sublevels (i.e., Follow oral instruction, Respond to question after listening, Use context to understand new phrases once listening, Draw conclusions, Predict, and Make simple conclusions when listening). The total eta r squared of 0.814 suggests that the teaching method may be associated with 81.4 percent of the variance in the composite of the six different posts of comprehension.

A Univariate Analysis (Tests of Somewhere between Effect) was carried out to analyze the specific differences seen across all six phonological awareness solar subgroups (Severally). The findings are shown in Table 11, which includes:

Table 11 displays the findings of the follow-up univariate analysis (between-subjects effects) on the six sub-levels of phonological awareness that were conducted after the impact of pre-test scores was controlled for.

Source	Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Teaching Strategy	Follow oral instruction	19.873	1	19.873	11.585	.001	.169
	Respond to question after listening	100.539	1	100.539	29.850	.000	.344
	Use context to understand new words when listening	23.996	1	23.996	18.663	.000	.247
	Summarizing	3.466	1	3.466	8.322	.006	.127
	Predicting	130.541	1	130.541	92.223	.000	.618
	Make simple inferences when listening	23.707	1	23.707	35.102	.000	.381
Error	Follow oral instruction	97.781	57	1.715			
	Respond to question after listening	191.981	57	3.368			
	Use context to understand new words when listening	73.286	57	1.286			
	Summarizing	23.741	57	.417			
	Predicting	80.683	57	1.415			
	Make simple inferences when listening	38.497	57	.675			
Corrected total	Follow oral instruction	131.015	64				
	Respond to question after listening	309.785	64				
	Use context to understand new words when listening	132.154	64				
	Summarizing	37.846	64				
	Predicting	228.062	64				
	Make simple inferences when listening	64.985	64				

Table 11 demonstrates that there is a statistically significant different performance between the participating students and those in the regulate team when it comes to trying to follow oral guidance, answering questions after having to listen, using background to discover fresh words when listening, summarising, predicting, and making simple inferences when listening, with the experimental group performing significantly better overall. As a result, one can conclude that students' performance in all six sub-levels was improved by using an AI teaching strategy. These are the partial eta squared figures for the six different listening sub-levels: 0.169, 0.344, 0.247, 0.227, and 0.618 and 0.381 respectively. This indicates that the teaching strategy was responsible for explaining 16.9 percent of the variance following oral instruction, 34.4 percent of the variance when responding to questions after listening, 24.7 percent of the variance when using context to understand new words when listening, 22.7 percent of the variance when summarising, predicting, and making simple inferences when listening, respectively.

In addition, both the corrected and uncorrected means of the experimental and control sample were determined. Table 12 presents the findings in graphical form.

Table 12 displays the corrected and unmodified group means as well as the variance of the instructional approach when using which was before scores as a covariate.

Reading comprehension Sub-levels	Group	Unadjusted Means		Adjusted Means	
		Mean	S.E	Mean	Std
Follow oral instruction	Experimental	6.36	1.54	6.44	.231
	Control	5.38	1.13	5.30	.234
Respond to question after listening	Experimental	7.58	1.98	7.67	.323
	Control	5.22	1.74	5.12	.329
Use context to understand new words when listening	Experimental	7.03	1.42	7.08	.200
	Control	5.88	1.21	5.83	.203
Summarizing	Experimental	3.88	.74	3.93	.114
	Control	3.50	.76	3.45	.116
Predicting	Experimental	7.88	1.53	7.88	.210
	Control	5.03	.93	4.97	.213
Make simple inferences when listening	Experimental	4.36	.90	4.39	.145
	Control	3.19	.74	3.16	.147

Table 12 illustrates the mean, measurement deviation, standard deviation, and variance of the test group's and the controls group's knowledge in the six listening sub-levels before and after controlling the effect of pre-test results. After accounting for the disparities in pre-test scores, Table 11 demonstrates that there are still differences between the experimental group and the control group in six of the sublevels of hearing. As a result, students' overall performance improved across all following sub of phonological awareness when the AI teaching technique was used.

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