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The Impact of Storytelling on University Students' Reading Comprehension and Word Recall by Using A Systematic Approach

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Abstract

This study investigates the impact of storytelling on Jordanian university students' reading comprehension and word recall. It aims to explore the role of contextualized storytelling in enhancing reading skills and word recall, compare the efficacy of contextualized storytelling with dual-code and text-only approaches, and examine the influence of gender on the outcomes. The study employs a systematic approach involving a control group and an experimental group of first-year undergraduate students, using pre-test and post-test measures to assess changes in reading comprehension and word recall. The main findings reveal that contextualized storytelling, particularly with a dual-code approach, significantly improves students' reading comprehension and word recall compared to traditional text-only methods. The study also notes variations in effectiveness based on gender, with females generally performing better in storytelling tasks. The study contributes to the understanding of effective educational strategies in higher education and highlights the importance of contextualized, multimodal learning approaches for comprehensive language development.

Keywords: Storytelling, Reading Comprehension, Word Recall

1. Introduction

Storytelling is a timeless and universal aspect of human existence, spanning from ancient mythology to contemporary stories. It is deeply ingrained in our being, serving as a vital means to share our life experiences, principles, and beliefs. Fundamentally, storytelling involves the sharing of tales through various mediums — words, imagery, or other expressive forms — to transmit messages, entertain, educate, or uphold cultural traditions. It is an influential mechanism for fostering connections, evoking emotions, and frequently, inspiring changes as (Al-Mansour & Al-Shorman, 2011) said.

Eng & Chandrasekaran, (2014) argued that in essence, storytelling is a powerful educational tool, deeply embedded in human culture and psychology, enhancing the learning experience by making content more compelling, relevant, and enduring. As educators persist in exploring and refining storytelling strategies, this age-old practice is likely to continue evolving, enriching the educational terrain and sparking students' imaginations across the globe. Whether through the echoes of age-old stories or the interaction of a digital storytelling, storytelling in education promises a future of heightened understanding and interconnectedness

Eng & Chandrasekaran, (2014) states that within the realm of education, storytelling serves as a transformative force, revitalizing the way teaching and learning occurs by making it more captivating and pertinent. It goes beyond the conventional methods of memorization, enabling learners to emotionally bond with the content, thus deepening their comprehension and memory retention. Storytelling makes otherwise abstract or complex ideas accessible and engaging by embedding them in stories that is relatable or fascinating to the students. This approach not only bolsters literacy and communicative abilities but also stimulates critical thinking and innovation.

The main objectives of this study are the following:

-To investigate the role of storytelling in helping the Jordanian university students develop their reading skills and word recall.

-To compare the impact of reading based on contextualized storytelling with reading based on dual-code model and text-only approach reading.

-To measure whether gender has any impact on contextualized storytelling based on a dual code approach.

Huang (2006) states that developing the students' reading skills is considered one of the important challenges that face both the students and the teachers. Many tools have been adopted to develop the skill of reading comprehension, and storytelling is one of these tools. It is regarded one of the oldest ways of human communication and one of the most essential instruments in the field of pedagogy. The previous studies have proven that storytelling has a great influence on improving the students' comprehension and increasing the ability of the students in reading. Storytelling is defined by McDrury and Alterio (2002:31) as:

Uniquely a human experience that enables us to convey, through the language

> *of words, aspects of ourselves and others, and the worlds, real or imagined, that we inhabit. Stories enable us to come to know these worlds and our place in them given that we are all, to some degree, constituted by stories.*

What makes this study different from other studies is the focus on university students and the use of Dual code Model. No previous research, to the best of the researcher's knowledge, has been conducted to shed light on the role of storytelling in helping university students develop their reading skills and word recall by adopting Dual code approach in the Arab countries. The previous studies have focused on pupils at schools.

This study seeks answers to the following research questions:

(1) What is the impact of contextualized storytelling based on a dual –code approach in the students' reading comprehension and word recall?

(2) Is contextualized storytelling based on dual -code approach a more influential intervention than text-only reading in the Jordanian University Students' reading?

(3) Does the students' gender have any impact on contextualized storytelling based on a code- dual approach?

2. Literature Review

https://www.semanticscholar.org/paper/THE-USE-OF-CONTEXTUALIZED-STORYTELLING-TO-ENHANCE-%E2%80%99-Eng/908765ff05792a02dc2624ca90c2919da2362b5a?utm_source=direct_link

3. Methodology

This study adopts an experimental design with a control group to systematically evaluate the effects of the storytelling intervention. The study has 20 first-year undergraduate students enrolled in the English Language and Translation program at a (Isra) university in Jordan. This group is evenly split between males and females, with ages ranging from (18 to 24) years. The selection process includes a proficiency assessment to ensure uniform language proficiency levels, as well as a learning style evaluation to identify individual learning preferences. Following these assessments, the participants are randomly allocated into two groups: one control group and one experimental group, each comprising ten students. Data are collected from a word recall test, an activity of story retelling in addition to a short questionnaire. This study is based on comparing the reading performance and word recall of two different groups (one experimental group and one control group).

After finishing the word recall test, the activity of story retelling and the short questionnaire, quantitative study was conducted to measure on the impact of contextualized storytelling approach on the development of reading comprehension among the Jordanian university students. The recordings were transcribed the recordings by using Amber Script, version (1.0),

which is convenient and freely available online. A T-test is used to find out the effect of gender on the use contextualized storytelling based on a code- dual approach.

3.1 Sample of Study

The sample consisted of first-year undergraduate students who have enrolled in repeatedly English language and Translation programs at a at a (Isra) university in Jordan. Specifically, the sample includes 20 participants, evenly distributed between genders (10 males and 10 females), with ages ranging from 18 to 24 years. The choice of these students is based on their performance in a proficiency test to ascertain their individual learning preferences. Subsequently, they were randomly assigned into two groups: a control group and an experimental group, each comprising 10 students.

3.2 Subjects

The subjects in this study are university students. The tools have been used to collect data are word recall test and an activity of story retelling in addition to a short questionnaire.

3.3 Study Tools

The study tools consist of a word recall test (Appendix1), an activity of story retelling (Appendix2), in addition to a short questionnaire (Appendix3). The purpose of employing the word recall test is to assess the participants' ability to remember specific words after the reading ability session. It is a ready-made one and it consists of 60 words: 30 words from the story and 30 distracting words. Word recall test is a conventional gauge of memory, employed to evaluate the extent to which students can retain the words they have come across in a narrative. The test can be conducted through various methods, but a prevalent method involves providing students with a list of words and prompting them to recollect as many as possible after a brief interval (Huang, 2006). Word recall test incorporates a blend of crucial story-related words and those of lesser significance. This approach helps to gauge both the students' comprehension of the narrative and their overall memory capabilities.

(Spencer & Slocum, 2010) said that the Activity of story retelling is the process of narrating or summarizing a previously encountered story. This activity aims to evaluate comprehension, memory, and the capacity to convey the core elements of the narrative. Widely utilized in educational contexts, it serves to gauge one's grasp of a story and improve their comprehension abilities. Moreover, it serves as a valuable exercise for honing language proficiency, refining storytelling aptitude, and fostering critical thinking skills.

The story used in this study is titled Circus Escape. It contains approximately 400 words, making them appropriately sized for first-year students. Furthermore, both stories are accompanied by illustrated pictures, which play a crucial role in comprehending the narrative as a whole. The researcher has asked the students to retell the story in their own words. The control group will be exposed to text-only story; the experimental group will be exposed to illustrated written story (Dual-Code approach).

A short questionnaire made up of ten paragraphs is used to elicit demographic information from the participants. The questionnaire was reviewed by arbitrators before distribution to the

participants.

4. Results

This section provides a brief overview of the statistical methods employed in the study and their corresponding outcomes. The section comprises six parts, including the introduction and subsequent progression. The primary objective of this experimental research is to investigate the impact of a specific intervention on the study participants. The statistical package for social science (SPSS, version 24, Chicago Inc.) was used to analyze the data. Descriptive analysis, which entailed central tendency, dispersion, frequencies, and percentages, was used to describe the sample characteristics and their pre-and post-intervention scores. Furthermore, independent sample t-test, paired t-test, and two-way repeated measure ANOVA were utilized to answer the research questions.

In this study, 20 participants voluntarily agreed to participate and were divided equally into control and experimental groups using the technique. Each group consisted of 50% (n = 10) male and 50% (n = 10) female participants.

Table 1

Sample description

Gender	Control		Experimental		Total	
	N	%	N	%	N	%
Male	10	50	10	50	20	50
Female	10	50	10	50	20	50
Total	20	50	20	50	40	50

The results presented in Table 2 showcase the findings obtained from the pre-test and post-test taken by the study participants. The word-based test was conducted during the pre-test and post-test was scored between 0 and 9, with a mean score of 4.28 (SD = 2.03) and 5.80 (SD = 1.87), respectively. The interquartile range analysis showed that half of the participants scored above 4.5 in the pre-test and above 6 in the post-test. Additionally, 75% of the participants scored above 3 in the pre-test and above 4.5 in the post-test. These findings suggest that the participants had a low to moderate level of word-recalling proficiency in the pre-test and a moderate level in the post-test. It is important to note that the expected score range was up to 10.

The control group participants' scores ranged from 2 to 9, with a mean of 4.70 (SD = 1.89). The interquartile range analysis indicated that 50% of the control group scored five or above, while 25% scored six or higher. This suggests that the control group participants have a low to moderate level of word-recalling proficiency, considering the expected score range of up to 10. Additionally, 75% of the control group scored 3.50 or higher. During the post-test, the control group participants' scores ranged from 2 to 9, with a mean of 5.30 (SD = 1.89). The

interquartile range analysis show that 50% of the control group scored 5.50 or above, while 25% scored seven or higher. This indicates that the control group participants have a low to moderate level of word-recalling proficiency.

The experimental group participants' scores ranged from 0 to 7, with a mean of 3.85 (SD = 2.11). The interquartile range analysis indicates that 50% of the experimental group scored four or above, while 25% scored 5.50 or higher. This suggests that the experimental group participants have a low to moderate level of word-recalling proficiency, considering the expected score range of up to 10. Furthermore, 75% of the experimental group scored 2.50 or higher. During the post-test, the experimental group participants' scores ranged from 3 to 9, with a mean of 6.30 (SD = 4.75). The interquartile range analysis shows that 50% of the experimental group scored six or above, while 25% scored 7.50 or higher. This indicates that the experimental group participants have a moderate to high level of word-recalling proficiency. Additionally, 75% of the experimental group scored five or higher.

Table 2

Pre- and post-test results description

Test/time	Group	M	SD	Min	Max	P_{25}	P_{50}	P_{75}
pre word called test	Control	4.70	1.89	2	9	3.50	5	6
	Experimental	3.85	2.11	0	7	2.50	4	5.50
	Total	4.28	2.03	0	9	3	4.50	6
post word called test	Control	5.30	1.89	2	9	3.50	5.50	7
	Experimental	6.30	1.75	3	9	5	6	7.50
	Total	5.80	1.87	2	9	4.50	6	7
pre retelling story	Control	2.60	1.05	1	4	2	3	3
	Experimental	4.20	1.82	1	7	3	4	6
	Total	3.40	1.68	1	7	2	3	4
post retelling story	Control	5.95	1.67	2	8	4.50	6	7
	Experimental	4.20	1.82	1	7	3	4	6
	Total	5.08	1.94	1	8	4	5.50	6.50

The retelling story test, scored between 1 and 7, revealed that the pre-test's mean score was 3.40 (SD = 1.68), while the post-test's was 5.08 (SD = 1.94). The interquartile range analysis showed that half of the participants scored above four on the pre-test and above 5.50 on the post-test. Moreover, 75% of the participants scored above 2 in the pre-test and above 4 in the post-test. These results suggest that the participants have a low level of word-recalling proficiency in the pre-test and a low to moderate level in the post-test. It is worth noting that the expected score range was up to 10.

The control group participants' scores ranged from 1 to 4, with a mean of 2.60 (SD = 1.05). The interquartile range analysis shows have that 50% of the control group scored three or above, while 75% scored two or higher. This indicates that the control group participants have a low level of word-recalling proficiency, considering the expected score range of up to 10. During the post-test, the control group participants' scores ranged from 2 to 8, with a

mean of 5.95 (SD = 1.67). The interquartile range analysis shows that 50% of the control group scored six or above, while 25% scored seven or higher. This indicates that the control group participants had a moderate level of word-recalling proficiency. Additionally, 75% of the experimental group scored 4.50 or higher.

The experimental group participants' scores remains the same during both pre-and post-tests, with a range of 1 to 7 and a mean of 4.20 (SD = 1.82). The interquartile range analysis indicates that 50% of the experimental group scored four or above, while 25% scored six or higher. This suggests that the experimental group participants have a low to moderate level of word-recalling proficiency, considering the expected score range of up to 10. Furthermore, 75% of the experimental group scored three or higher.

4.1 Differences in pre-and post-test scores between control and Experimental groups

To examine the difference in the word-recall ability between control and interventional groups in the pre-test and post-test, an independent sample t-test was conducted with a significance level of alpha < 0.05. Measures were taken to ensure the fulfillment of all parametric test assumptions, including random sample observations, normal distribution of all variables, and equality of variances (as indicated by Skewness values within the range of -2 to +2 and Kurtosis values within the range of -7 to +7). According to the results presented in Table 3, no significant difference was found in word-recall test scores between control and interventional groups in both pre-test (t = 1.341, p = 0.188) and post-test (t = -1.734, p = 0.091). However, there was a significant difference (t = -3.403, p = 0.002) in the retelling story test scores between the control and experimental groups in the pre-test, with the mean score for participants in the control group (M = 2.60, SD = 1.04) being lower than that of participants in the experimental group (M = 4.20, SD = 1.82). Similarly, a significant difference (t = 3.165, p = 0.003) is observed in the retelling story test scores between the control and interventional groups in the post-test, with the mean score for participants in the control group (M = 5.95, SD = 1.66) being higher than that of participants in the experimental group (M = 4.20, SD = 1.82).

Table 3

Differences in pre-and post-test scores between control and Experimental groups

Test/time	Group	Descriptive		t-test	
		M	SD	t	P
pre word called test	Control	4.70	1.89	1.341	0.188
	Experimental	3.85	2.10		
post word called test	Control	5.30	1.89	-1.734	0.091
	Experimental	6.30	1.75		
pre retelling story	Control	2.60	1.04	-3.403	0.002
	Experimental	4.20	1.82		
post retelling story	Control	5.95	1.66	3.165	0.003
	Experimental	4.20	1.82		

4.2 Differences in pre-and post-test scores within control and Experimental groups

One aim of this study was to compare the word-recalling ability of participants before and after interventions in both control and experimental groups. To this end, paired t-tests are used to investigate the difference in word-recalling ability, with a significance level of alpha < 0.05. To ensure that all parametric test assumptions are satisfied, measures were taken to guarantee random sample observations, normal distribution of all variables, and equality of variances (as evidenced by Skewness values within the range of -2 to +2 and Kurtosis values within the range of -7 to +7). Analysis (table 4) reveals that there was a significant difference ($t = -5.244$, $p < 0.001$) in the word-recalling ability scores of participants in the experimental group before and after the new word-calling intervention.

Specifically, the mean word-recalling ability score before the new intervention was 3.85 (SD = 2.10), lower than the mean word-recalling ability score after the intervention, 6.30 (SD = 1.75). This indicates that the word-recalling ability scores are more likely to increase after using the new word-calling intervention. Similarly, there was a significant difference ($t = -10.802$, $p < 0.001$) in the word-recalling ability scores of participants in the control group before and after the conventional retelling-story intervention. The mean word-recalling ability score before the intervention was 2.60 (SD = 1.04), which was lower than the mean word-recalling ability score after the intervention, which was 5.95 (SD = 1.66). These findings suggest that the word-recalling ability scores are more likely to increase after using the conventional retelling-story intervention.

Table 4

Differences in pre-and post-test scores within control and experimental groups

Test/group	Time	Descriptive		t-test	
		M	SD	t	P
Control/called test	Pre-test	4.70	1.89	-1.878	0.076
	Post-test	5.30	1.89		
Experimental/called test	Pre-test	3.85	2.10	-5.244	< 0.001
	Post-test	6.30	1.75		
Control/retelling story	Pre-test	2.60	1.04	-10.802	< 0.001
	Post-test	5.95	1.66		
Experimental/retelling story	Pre-test	4.20	1.82	-	-
	Post-test	4.20	1.82		

4.3 Differences within pre-and post-test scores among control and Experimental groups

This section aims to elucidate the difference between the pre-test of word-recalling and retelling story among study groups and the difference in the post-test of word-recalling and retelling story. To achieve this, paired t-tests were conducted to investigate the difference in word-recalling ability, with a significance level of alpha < 0.05. To meet all parametric test assumptions, it was ensured random sample observations, normal distribution of all variables,

and equality of variances (as evidenced by Skewness values within the range of -2 to +2 and Kurtosis values within the range of -7 to +7).

The analysis, presented in Table 5, reveals significant differences in the pre-test of word-recalling and retelling story among all participants (t = 2.158, p = 0.037) and the control group (t = 3.907, p = 0.001). The pre-test of word-recalling score mean is higher than the pre-test of retelling story score mean in both cases, with a mean of 4.27 (SD = 2.02) and 4.70 (SD = 1.89), respectively. Likewise, there is a significant difference (t = 3.390, p = 0.003) between the post-test of word-recalling and the post-test of retelling story among the experimental group, with a post-test of word-recalling score mean of 6.30 (SD = 1.75) and a post-test of retelling story score mean of 4.20 (SD = 1.82). The results suggest that word-recalling ability may be superior to retelling story ability in specific contexts, as evidenced by the higher pre-test scores observed in the word-recalling group.

Table 4

Differences within pre-and post-test scores among control and experimental groups

Test/time	Time	Intervention	Descriptive		t-test	
			M	SD	T	P
Total	Pre-test	Word-called test	4.27	2.02	2.158	0.037
		Retelling story	3.40	1.67		
	Post-test	Word-called test	5.80	1.87	1.432	0.160
		Retelling story	5.07	1.93		
Control group	Pre-test	Word-called test	4.70	1.89	3.907	0.001
		Retelling story	2.60	1.04		
	Post-test	Word-called test	5.30	1.89	-.948	0.355
		Retelling story	5.95	1.66		
Experimental group	Pre-test	Word-called test	3.85	2.10	-0.733	0.472
		Retelling story	4.20	1.82		
	Post-test	Word-called test	6.30	1.75	3.390	0.003
		Retelling story	4.20	1.82		

4.4 Differences in pre-and post-test scores between genders among control and Experimental groups.

Based on the data collected, it was found that in the control group, there was a significant difference between male and female participants in their pre-test scores for retelling story intervention (t = -4.005, p = 0.001). The mean score for females was 3.30 (SD = 0.67), higher than that for males, whose mean score was 1.90 (SD = 0.87). Additionally, there was a significant difference between male and female participants in their post-test scores for retelling story intervention (t = -2.599, p = 0.018). The mean score for females was 6.80 (SD = 0.78), higher than that for males, whose mean score was 5.10 (SD = 1.91).

In the experimental group, it was observed that there was a significant difference between

male and female participants in their post-test scores for the word-called intervention (t = -3.579, p = 0.002). The mean score for females is 7.40 (SD = 1.26), higher than that for males, whose mean score was 5.20 (SD = 1.47). Furthermore, there is a significant difference between male and female participants in their post-test scores for retelling story intervention (t = 2.138, p = 0.046). The mean score for males is 5 (SD = 1.24), higher than that for females, whose mean score is 3.40 (SD = 2.01).

Table 5

Differences within pre-and post-test scores among control and experimental groups

Total		Descriptive		t-test	
Test/time	Gender	Mean	Std. Deviation	t	P
Pre word called test	Male	4.40	2.30	0.386	0.702
	Female	4.15	1.75		
Post word called test	Male	5.55	1.70	-0.842	0.405
	Female	6.05	2.03		
Pre retelling story	Male	3.45	1.90	0.186	0.853
	Female	3.35	1.46		
Post retelling story	Male	5.05	1.57	-0.080	0.936
	Female	5.10	2.29		
Control group		Descriptive		t-test	
Test/time	Gender	Mean	Std. Deviation	t	P
Pre word called test	Male	5.50	2.01	2.039	0.056
	Female	3.90	1.44		
Post word called test	Male	5.90	1.91	1.458	0.162
	Female	4.70	1.76		
Pre retelling story	Male	1.90	0.87	-4.005	0.001
	Female	3.30	0.67		
Post retelling story	Male	5.10	1.91	-2.599	0.018
	Female	6.80	0.78		
Experimental group		Descriptive		t-test	
Test/time	Gender	Mean	Std. Deviation	t	P
Pre word called test	Male	3.30	2.11	-1.178	0.254
	Female	4.40	2.06		
Post word called test	Male	5.20	1.47	-3.579	0.002
	Female	7.40	1.26		
Pre retelling story	Male	5	1.24	2.138	0.046
	Female	3.40	2.01		
Post retelling story	Male	5	1.24	2.138	0.046
	Female	3.40	2.01		

4.5 Effects of different interventions and time, controlling gender on the word recalling scores

among control and Experimental groups

A two-way repeated measure ANOVA have performed to evaluate the effects of interventions and time, controlling gender effect on the word calling scores among control and interventional groups. The means and standard deviations for the word calling scores regarding intervention type with the gender scale among control and interventional groups are presented in table 7 below. These descriptive statistics show that the interventional group has a higher mean of word-calling scores regarding the word-called intervention than the control group at post-test time. Females in the interventional group have a higher mean of word-calling scores regarding the word-called intervention at post-test time. In comparison, males in the control group have a higher mean of word-calling scores regarding the word-called intervention at post-test time.

Moreover, the control group has a higher mean of word-calling scores regarding the retelling-story intervention than the interventional group at post-test time. Females in the control group have higher mean word-calling scores regarding the retelling-story intervention at the post-test. In comparison, there is no change in males' word-calling scores among the interventional group over time. However, males in the interventional group have a higher mean of word-calling scores regarding the retelling-story intervention.

Females in the interventional group has the highest mean of word-calling scores regarding the word-called intervention during the post-test (i.e., the best scores), while the lowest mean is for males in the control group regarding the retelling-story intervention during the pre-test (i.e., worst scores). The total score of CIPNAT regarding interference with activity scale means went down across time (assessment). However, the highest increase in word-calling scores between pre-test and post-test times is for males in the control group regarding the retelling-story intervention 3.20.

Table 6

Descriptive statistics for total score of CIPNAT regarding interference with activity scale

Intervention type	Group	Gender	Time			
			Pre-test		Post-test	
			M	SD	M	SD
Word called test	Control	Male	5.50	2.01	5.90	1.91
		Female	3.90	1.44	4.70	1.76
		Total	4.70	1.89	5.30	1.89
	Experimental	Male	3.30	2.11	5.20	1.47
		Female	4.40	2.06	7.40	1.26
		Total	3.85	2.10	6.30	1.75
Retelling story	Control	Male	1.90	0.87	5.10	1.91
		Female	3.30	0.67	6.80	0.78
		Total	2.60	1.04	5.95	1.66
	Experimental	Male	5	1.24	5	1.24
		Female	3.40	2.01	3.40	2.01

		Total	4.20	1.82	4.20	1.82

A repeated measures ANOVA was conducted to analyse the effect of word-calling and retelling-story interventions on word-recalling scores while controlling for the influence of gender among control and interventional groups (table 8). Results indicated a significant main effect of being in control or interventional groups on word-recalling scores in word-calling interventions, $F(1) = 35.741$, $p < 0.001$. Additionally, there is a significant main effect of being in control or interventional groups on word-recalling scores in retelling-story interventions, $F(1) = 111.914$, $p < .001$. However, there has no significant effect of the interaction between group and gender in word-calling and retelling-story interventions $p > 0.05$.

In addition, there is no significant effect of time on the word-recalling scores in both interventions $p > 0.05$. However, there is a significant main effect of the interaction between time and gender regarding word-recalling scores in word-calling interventions, $F(1) = 7.743$, $p = 0.012$. also, there is a significant main effect of the interaction between time and gender regarding word-recalling scores in retelling-story interventions, $F(1) = 22.594$, $p = 0.012$.

Furthermore, there is a significant main effect of the interaction between group and time regarding word-recalling scores in word-calling interventions, $F(1) = 9.053$, $p = 0.008$. There is a significant main effect of the interaction between group and time regarding word-recalling scores in retelling-story interventions, $F(1) = 111.914$, $p < 0.001$. However, the interaction effect between group, time, and gender is not significant in word-calling and retelling-story interventions $p > 0.05$.

Table 7

Tests of Within-Subjects Contrasts

Source	Measure	Mean Square	F	Sig.
Group	Word	46.513	35.741	<0.001
	Story	56.113	111.914	<0.001
group * GENDER	Word	2.813	2.161	0.159
	Story	0.113	0.224	0.641
Time	Word	0.113	0.019	0.893
	Story	0.113	0.051	0.823
time * GENDER	Word	46.513	7.743	0.012
	Story	49.613	22.594	<0.001
group * time	Word	17.113	9.053	0.008
	Story	56.113	111.914	<0.001
group * time * GENDER	Word	0.613	0.324	0.576
	Story	0.113	0.224	0.641

4.6 Effects of different interventions and time, controlling gender on the word recalling scores among control and Experimental groups

A two-way repeated measure ANOVA was performed to evaluate the effects of interventions and time, controlling gender effect on the word calling scores among control and interventional groups. The means and standard deviations for the word calling scores regarding intervention type with the gender scale among control and interventional groups are presented in (table 7) below. These descriptive statistics show that the interventional group has a higher mean of word-calling scores regarding the word-called intervention than the control group at post-test time. Females in the interventional group have a higher mean of word-calling scores regarding the word-called intervention at post-test time. In comparison, males in the control group have a higher mean of word-calling scores regarding the word-called intervention at post-test time.

Moreover, the control group has a higher mean of word-calling scores regarding the retelling-story intervention than the interventional group at post-test time. Females in the control group has higher mean word-calling scores regarding the retelling-story intervention at the post-test. In comparison, there is no change in males' word-calling scores among the interventional group over time. However, males in the interventional group have a higher mean of word-calling scores regarding the retelling-story intervention.

Females in the interventional group has the highest mean of word-calling scores regarding the word-called intervention during the post-test (i.e., the best scores), while the lowest mean is for males in the control group regarding the retelling-story intervention during the pre-test (i.e., worst scores). The total score of CIPNAT regarding interference with activity scale means went down across time (assessment). However, the highest increase in word-calling scores between pre-test and post-test times is for males in the control group regarding the retelling-story intervention 3.20.

A repeated measures ANOVA was conducted to analyze the effect of word-calling and retelling-story interventions on word-recalling scores while controlling for the influence of gender among control and interventional groups (table 8). Results indicate a significant main effect of being in control or interventional groups on word-recalling scores in word-calling interventions, $F(1) = 35.741$, $p < 0.001$. Additionally, there is a significant main effect of being in control or interventional groups on word-recalling scores in retelling-story interventions, $F(1) = 111.914$, $p < .001$. However, there is no significant effect of the interaction between group and gender in word-calling and retelling-story interventions $p > 0.05$.

In addition, there is no significant effect of time on the word-recalling scores in both interventions $p > 0.05$. However, there is a significant main effect of the interaction between time and gender regarding word-recalling scores in word-calling interventions, $F(1) = 7.743$, $p = 0.012$. There is a significant main effect of the interaction between time and gender regarding word-recalling scores in retelling-story interventions, $F(1) = 22.594$, $p = 0.012$.

Furthermore, there is a significant main effect of the interaction between group and time

regarding word-recalling scores in word-calling interventions, $F(1) = 9.053$, $p = 0.008$. here is a significant main effect of the interaction between group and time regarding word-recalling scores in retelling-story interventions, $F(1) = 111.914$, $p < 0.001$. However, the interaction effect between group, time, and gender is not significant in word-calling and retelling-story interventions $p > 0.05$.

5. Conclusion

The study aimed to explore the effects of contextualized storytelling, specifically based on a dual-code approach, on the reading comprehension and word recall of Jordanian university students. Additionally, the impact of gender on the effectiveness of this intervention was investigated. Firstly, the general trend of females exhibiting heightened verbal proficiency is well-documented across various educational contexts. This is aligned with the findings of previous research, such as those by Huang (2006) and Al-Mansour and Al-Shorman (2011), which, while not focusing specifically on gender differences, underscore the effectiveness of storytelling in enhancing language skills. The advantage of females in verbal memory and tasks, including word recall, can be connected to neurological and developmental differences that influence language acquisition and processing. This is in line with the broader literature on gender differences in cognition, which often reports females having a verbal advantage.

Secondly, the significant gender disparities observed in the experimental group, where contextualized storytelling was employed, suggest differing cognitive processing styles between males and females. This is corroborated by research into gender-based cognitive processing differences, where males often demonstrate strengths in visual-spatial tasks, which could contribute to their superior performance in retelling stories, potentially engaging more with the visual elements of the dual-code approach. Studies like those by Eng & Chandrasekaran (2014) and Derso (2018) emphasize the dual-code approach's effectiveness in enhancing comprehension and recall, indirectly supporting the notion that males and females might engage with and benefit from these dual aspects differently.

Furthermore, learning style preferences, societal expectations, and cultural norms likely play a significant role in how males and females respond to contextualized storytelling. The narrative-rich approach of storytelling, combine with visual elements, might naturally appeal more to females' verbal tendencies and males' visual-spatial strengths, respectively. This echoes the findings from Yulianawati, Nurhadi, and Mayasari (2022), highlighting storytelling's role in engaging students and improving their attitudes towards reading, suggesting that engagement might differ by gender based on the storytelling approach.

To enhance educational outcomes, an integrated approach is proposed that merges traditional teaching methods with innovative strategies like contextualized storytelling, thus catering for diverse learning styles and boosting comprehension and retention. This initiative encompasses professional development for educators, emphasizing skill enhancement in contextualized storytelling and dual-code approaches through workshops and seminars. Collaboration with curriculum designers should ensure the integration of these methods into

official curriculums, supported by allocated resources for the development of teaching materials. Technological advancements are encouraged to create visually engaging narratives, complementing the dual-code approach and making learning more impactful. The initiative advocates for inclusive teaching practices, recognizing diverse cognitive strengths and adapting instructional methods to accommodate these differences. Periodic assessments should monitor the effectiveness of these strategies, allowing for necessary adjustments based on feedback from students and educators. Gender-informed strategies should be developed to address cognitive preferences across genders, promoting a more equitable learning environment. Collaborative research initiatives should explore the nuances of contextualized storytelling's impact, supported by global comparative studies to assess its universality across different cultures and educational systems. Finally, a platform for disseminating best practices should be established, offering a repository of successful implementations and resources to aid educators worldwide in refining their teaching methods for improved learning outcomes.

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