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Effectiveness of Utilizing Gamified Learning in Improving Creative Reading Skills among Primary School Students

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ABSTRACT

Gamification, in education is a method that boosts pupil participation and drive by encouraging the growth of analytical and creative thinking abilities through the integration of gaming components into the learning process. The impact of gamification on enhancing reading skills in second grade students was investigated in this research study as this phase is pivotal for language and cognitive growth. A selective group of 104 students was split into two groups, for the study – one receiving instruction while the other followed conventional teaching approaches. A comprehensive test measuring creative reading skills—covering fluency, originality, and flexibility—was administered to both groups before and after the intervention, ensuring its validity and reliability. The results demonstrated that students exposed to gamified learning showed significant improvements in creative reading skills compared to those in the traditional group, particularly in fluency, originality, and flexibility. However, no statistically significant differences in skills acquisition were found based on school type, suggesting that gamified learning is effective across diverse learning settings. The

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research highlights the significance of incorporating gamification, in curricula to boost student participation and innovation. It suggests teacher education to apply these methods. Through learning that creates an engaging atmosphere it not only improves students' imaginative reading skills but also encourages analytical thinking. They provide a fun learning environment that aligns with learning objectives.

Keywords: Utilizing Gamification; Reading Lessons; Creative Thinking Skill

1. Introduction

Reading is one of the most prominent linguistic skills that contribute to the development of thought and the enhancement of various intellectual and cognitive abilities [1, 2]. Creative reading has been defined as a deep interactive process between the reader and the text, with a focus on producing new and innovative insights [3]. This cognitive and emotional process allows the reader to connect various ideas and generate innovative solutions to the problems encountered within the texts. Through this process, the reader is not merely a consumer of information but becomes an active participant in the development and analysis of ideas [3–5].

Creative reading is a complex process that requires a set of essential skills to ensure maximum effectiveness. Fluency plays a role, among these skills and abilities as it helps readers effortlessly grasp the concepts and messages of the text and enhances their comprehension skills significantly [6–12]. This skills significance lies in its capacity to help readers establish correlations between concepts and spark insights connected to the material they are reading which enriches their overall reading experience. When readers are able to remember ideas, from the text they are reading it empowers them to actively interact with the content by employing analytical, critical and imaginative thinking skills [13–15].

In terms of being flexible, in reading comprehension skills entail the readers' capability to change their mindset and adjust to the texts context. This ability enables the reader to delve into ideas and contemplate viewpoints resulting in a wider range of ideas they may come up with while reading [11, 14, 15]. Flexibility is considered a vital skill as it helps the reader grasp complex texts and appreciate contradictions and diversity in opinions [16–20].

Furthermore, creative reading involves developing thinking skills that prompt the reader to explore several perspectives and generate fresh and surprising insights from the material at hand [10, 13, 15]. By nurturing creativity, readers can move beyond surface-level analyses and delve into a more profound and innovative comprehension of the text's substance. The trio of fluency, flexibility, and originality are the elements that pave the way for cultivating reading abilities, boosting one's capacity to engage with texts in a more compelling and innovative manner [6, 8, 21–24].

From the above, it is clear that learning practices in teaching creative reading require the implementation of strategies that activate the student's role as an autonomous learner of reading skills [1, 2, 25–27]. Creative reading is not just a cognitive process, but a means of self-challenge and an enhancement of critical and creative thinking abilities [26, 27]. In this context, game-based learning in reading lessons stands out as one of the contemporary educational innovations that contribute to creating reading environments conducive to creativity. In these settings individuals get to blend their background with their past encounters unveiling fresh opportunities, for adventure and enlightenment which ultimately enriches their profound comprehension of the world surrounding them [27, 28].

Game based learning is a type of electronic learning system created to boost student engagement by incorporating gaming components into the learning journey. This method aims to leverage games to aid in learning and create a manageable experience, for students. From the perspective of cognitive psychology, psychologists [29–31] emphasize that gamification involves using game elements to motivate learners to explore and learn while striving to achieve specific goals. It does not focus on winners or losers but aims to promote positive behaviours associated

with learning outcomes. Gamification enhances learner engagement by transforming boring courses and lengthy lectures into engaging and enjoyable experiences. It also encourages friendly competition among peers, instilling a sense of pride upon completing tasks and challenges and fostering their emotional connection to the learning content [29, 32].

In the context of modern education, learning games are effective tools for equipping students with scientific thinking skills, especially in learning language skills. Gamified learning, as stated by researchers [2, 12, 27, 29, 30, 32, 33], contributes to providing a stimulating and engaging learning environment by integrating tasks or challenges that capture students' interests. This integration of technology in education encourages student interaction, enhances creativity, and simplifies complex subject matter. Game-based learning enables students to explore knowledge independently through trial and error, where failure serves as a motivator to adopt new strategies to achieve game objectives [3, 6, 8, 9, 10, 11, 34, 35].

Given the importance of gamified learning, numerous studies [1,2,29,30,33,36,37] have addressed the impact of gamification strategies on academic achievement, motivation, and student engagement in the learning process. These studies indicate varying results in this area, opening the door for further research to explore how to improve learning outcomes using these strategies. For instance, a study by Al-Ahmadi & Kinsara [10] examined the academic achievement of elementary students in Medina through gamification activities, finding no statistically significant differences between individual and collaborative activities. These results draw attention to the importance of investigating other factors that may affect achievement when using gamification strategies, such as the nature of learning content.

Overall, the preceding points emphasize the importance of utilizing gamification strategies in teaching young children, particularly in the realm of creative reading skills. Research in this area can enrich the existing literature on gamified learning and address a clear gap in studies concerning the use of gamification to develop language skills in Arab contexts. By presenting a new theoretical framework that relies on integrating games into the learning process, this research opens new horizons for understanding how to enhance creative reading skills among children.

Moreover, the practical significance of the current research lies in providing reliable data and evidence that can be used to develop educational curricula. The research illustrates how to effectively apply gamification to motivate children to learn and engage, assisting teachers and educational supervisors in designing interactive and engaging learning activities. Through this research, current teaching strategies can be re-evaluated and made more compatible with the needs of young children.

Additionally, the research offers practical solutions to the challenges teachers face in teaching creative reading to children, particularly regarding addressing the issue of limited interaction among children in traditional learning settings. It proposes gamification as a means of making learning more enjoyable and interactive, leading to improved outcomes for students in creative reading.

In conclusion, the research contributes to achieving sustainable education by focusing on early childhood as the foundation for building linguistic and creative skills. It presents an innovative learning approach that can assist in preparing a generation of creative readers capable of critical thinking and creative analysis, thereby enhancing the lifelong learning process. Based on this information, researchers have embarked on studying the applications of gamification in learning environments to provide an enjoyable learning experience aimed at achieving learning objectives and enhancing students' skills. Consequently, the current research raises the following questions:

1. What is the impact of gamified learning on developing creative reading skills among young children in Arab contexts?
2. Are there statistically significant differences at the significance level ($p \leq 0.05$) between the mean performances of individuals in the experimental group in the creative reading skills test attributed to differences in the type of school (government using the national curriculum, private school using the national curriculum, private schools using the international curriculum) to which the student belongs?

2. Method

2.1. Research Design and Sampling

In this research project, we used a quasi-experimental approach to assess how effective gamification is, in enhancing and improving creative reading skills. The experimental group received instruction using gamification techniques, while the control group was taught using traditional methods. The study involved evaluating the participants' performance on a test of creative thinking skills both before and after they were exposed to the different teaching methods. In general, the study design can be summarized as follows.

Table 1 illustrates the meanings and implications of the symbols used in the study design. This design was chosen due to the inability to conduct a fully randomized experiment, enabling a comparison between two groups without complete random assignment. The quasi-experimental design offers flexibility, enabling researchers to assess the intervention's impact in real learning settings without fully manipulating variable factors. It also accommodates time and resource constraints, allowing hypotheses to be tested in existing learning contexts. The research involves variable that stands alone (gamification) and another factor that stands alone (school type) classified into schools following the national curriculum guidelines; schools following the national curriculum guidelines; and private schools adopting the international curriculum standards. The dependent variable, under study focuses on creative reading skills that cover fluency, flexibility, and originality. This design seeks to examine how gamification influences the development of creative reading skills, offering insights into its effectiveness in enhancing learning.

Table 1. Study Design.

Symbols	Meanings
EG	Experimental Group
CG	Control Group
O	Pre-test measurement of creative thinking skills in science
X	Treatment (Teaching Method through Gamification)
O	Post-test measurement of creative thinking skills in science

More importantly, it is worth noting that a quasi-experimental design was chosen over a fully randomized experimental approach because full randomization was not feasible. Constraints, such as predetermined school types and specific curriculum requirements, influenced sample assignment, thus preventing random allocation. This limitation was addressed by ensuring that the experimental and control groups were as comparable as possible in terms of school type and student demographics.

Accordingly, a total of 104 students were purposefully selected and distributed across six schools in Amman, the capital of Jordan. Three schools were placed in the control group. Three schools were allocated to the experimental group, for this study setup. The students were split into two groups. One with 52 students as part of the experimental group and another with 52 students, in the control group. This breakdown showcases how the sample is divided based on school type:

Table 2 presents the distribution of the study sample across the experimental and control groups, with each group comprising 52 students. The distribution shows a balance among different school types, with a notable representation of private national schools. This distribution is crucial for ensuring the validity of the results, as it allows for effective comparisons between the groups.

Table 2. Characteristics of the Study Sample.

Group	School Type	No.
Experimental	Public School using the National Curriculum	15
	Private School using the National Curriculum	18
	Private School using the international curriculum	19
	Total	52
Control	Public School using the National Curriculum	15
	Private School using the National Curriculum	17
	Private School using the international curriculum	20
	Total	52

The balanced distribution across different school types ensured that the sample was representative, allowing for reliable comparisons between the two groups. The inclusion of various school types strengthened the study's validity, especially regarding the generalizability of findings.

As the study involved minors, ethical protocols were

rigorously followed. The research was reviewed and approved by the relevant ethics committee. Informed consent was obtained from students' guardians, and all participants were informed about the purpose of the study, their right to withdraw, and the confidentiality of their information.

To minimize potential confounding factors, teacher influence and classroom environment were controlled as far as possible. Teachers in both the experimental and control groups had comparable experience and training. Efforts were made to ensure similar classroom environments, and any variation in teaching delivery was minimized through standardized lesson plans for both groups. By managing these factors, the study aimed to isolate the effects of the gamification intervention on creative reading skills.

2.2 Gamified Learning Materials

To achieve the study's objectives concerning the effectiveness of gamified learning in reading environments for enhancing creative reading skills, two gamified learning applications were utilized: Reading Eggs and Epic! The implementation of these applications was carried out as follows:

1. Reading Eggs: This application comprises a series of learning activities that include interactive games and innovative content, focusing on teaching children fundamental reading skills in an enjoyable and engaging manner. Participants were divided into small groups, with each group using the application regularly for six weeks. This structure promotes their understanding of texts through interactive learning, enabling students to engage with the content and thereby increasing their effectiveness in reading acquisition. Additionally, students were motivated by a creative reward system that offers points and prizes for completing activities. This approach enhances their active participation and boosts their motivation to learn and interact with the material. The students demonstrated a positive response, expressing a desire to explore more activities and books.

2. Epic!: This application provides a digital library with a diverse array of e-books, granting children the opportunity to explore new topics. The app features rich content that includes stories and interactive books, fostering children's imagination and enhancing their capacity to comprehend various ideas. Activities included organizing group reading sessions, where children could read books and discuss them with their peers. This setup fosters critical and creative thinking abilities, allowing children to exchange opinions and ideas about the stories and content they read, thereby contributing to the enhancement of their reading skills. A rewards system was also implemented in Epic! to encourage children to read more books, which motivated them to continue their reading journey and increased their engagement in the learning process.

Engaging and interactive learning environments were enhanced for children's reading skills by utilizing the Reading Eggs and Epic! The researchers developed learning lesson plans that centred on the concepts;

1. Ensuring precise and quantifiable learning goals are set to enhance reading abilities and boost comprehension levels for students, with needs and skill levels.

2. Creating a schedule involves planning out the timeline with the number of sessions and activities, for each task to maintain a well-rounded mix of activities for consistent engagement and learning enhancement, throughout the learning program.

3. Activity Diversification: Incorporating both individual and group activities, such as independent use of the applications and group reading sessions. This promotes self-directed learning and encourages interaction among children.

4. Formative Assessment: Implementing mechanisms for periodic assessment of students' progress, such as evaluative tests and direct observations, to track levels of engagement and interaction and ensure advancement in reading skills.

5. Additional Support: Providing individual tutoring sessions and supplementary resources for students who require assistance, thereby enhancing their learning experience and supporting self-directed learning.

6. Reward System: Utilizing a reward system to encourage children to engage with activities and read more books, alongside activating parents' role in enhancing the learning process by reading books with their children.

7. Plan Review and Evaluation: Conducting periodic reviews of the study plans to measure their effectiveness, while gathering feedback from teachers and students

to modify activities and timelines according to students' needs, ensuring ongoing motivation and enhancement of their learning experience.

To verify the reliability of the gamified learning procedures, the following steps were implemented:

1. Review of Gamified Learning Materials: The learning materials designed to impart specific knowledge content were presented to a group of reviewers from Jordanian universities, specializing in language teaching and information technology. This review aimed to evaluate the materials, provide feedback, suggest necessary modifications, and ensure alignment with the designed lesson objectives. All feedback provided was carefully considered.

2. Teachers crafted lesson plans utilizing gamified learning techniques following the endorsed model, by the Ministry of Education The plans highlighted the teachers' responsibilities as a mentor and guide in facilitating student centred learning experiences within the journey.

3. Review of Lesson Plans: The lesson plans designed for gamified learning were showcased to a panel of experts, in language instruction and technology. This step ensured the feasibility and clarity of the procedures, allowed for feedback collection, and facilitated appropriate modifications. All comments were taken into account to ensure the suitability of the educational unit.

4. Teacher Training: The principal researcher conducted five training workshops (five hours each) to train the teachers of the experimental group on how to teach using gamified learning, relying on gamified reading texts similar to those used in the study.

2.3 Study Instrument: Creative Reading Skills Test

In order to meet the goals of the study conducted on enhancing reading skills; an assessment tool (test) was created and developed targeting three skills based on Blooms cognitive taxonomy – knowledge retention and understanding; application of knowledge; and complex thinking skills (higher-order skills). The evaluation comprises 20 multiple choice questions, with four answer choices each; where one choice is deemed correct and earns a point when selected accurately while incorrect responses do not yield any points. The test items are distributed across the three primary skills:

1. Fluency Skills: These skills aim to measure the student's ability to read quickly and accurately, focusing on the smoothness with which the student engages with written texts while avoiding unnecessary pauses or hesitations during reading. This skill reflects the ability to recognize words and sentences instantly, understand relationships between words in context, and read fluently, indicating a rapid comprehension of meanings. The seven items dedicated to these skill present situations requiring students to read various texts within a specified time, such as short passages that necessitate immediate comprehension of words and sentences.

2. Flexibility Skills: These skills assess the student's ability to adapt their reading strategies based on the nature of the text and different contexts. For instance, a student might be asked to read an explanatory text and then adopt a different approach when reading a narrative text. The seven items related to this skill focus on the student's capacity to adjust to new information and reconsider their reading strategies flexibly. This means that the student should be able to determine when to read a text in detail and when to skim parts to focus on key points. The items include scenarios requiring the student to change their approach based on the questions posed or variations in the provided texts.

3. Originality Skills: These skills concentrate on measuring the student's ability to provide creative and unconventional responses to the read texts. They reflect the student's capacity to think in innovative and out-of-the-box ways, offering new ideas or interpretations of the presented information. The six items allocated to this skill assess the student's ability to generate original ideas or propose unconventional solutions when engaging with the texts. For example, a student may be asked to provide a personal, unconventional interpretation of events or characters in a story or suggest an alternative ending to a text based on their understanding.

2.4 Validity and Reliability

To verify the validity of the tool utilized in the re-

search project, expert opinions were sought after. Thirteen specialists, in curriculum design, language instruction methods, evaluation and assessment, and early childhood education were given the assessment to evaluate. Their assessments and suggestions on test content were taken into consideration, with adjustments being implemented based on feedback, from ten of them. The changes made involved taking out one item and adding a one while also adjusting the wording of five items to make sure they are clear and precise, in meaning.

Furthermore, the validity of the test was assessed by determining the correlation, between each item and the overall test score. The findings revealed that the correlation coefficients varied from 0.45 to 0.87 and all were deemed significant at the ($p \leq 0.05$) threshold. These outcomes illustrate a coherence, within the test suggesting that the items accurately capture the intended construct.

In order to check the reliability of the Creative Reading Skills Tests, the reliability factor was assessed using the split-half method. Resulted in a reliability coefficient of 0.93, which indicates a high level of trustworthiness was achieved in the test results consistency measurement process. Additionally, an evaluation of consistency, among the test items was carried out using Cronbach alpha, where it was found that fluency skills scored originality skills scored 0.90 and flexibility skills scored 0.88 respectively. When considering all aspects together the reliability coefficient for the test stood at 0.91 reflecting a solid level of internal consistency, across different skill domains.

For research purposes, these values are deemed satisfactory as they indicate the dependability of the tool utilized to assess the skills in question. Therefore, the Creative Reading Skills Assessment exhibits a level of validity and reliability thereby boosting the trustworthiness of the findings acquired.

2.5 Data Collection and Analysis

Before initiating the data collection process, the teachers in the experimental group underwent intensive training on the gamified learning strategy and how to implement the specified learning content from the ninth-grade language curriculum. After the training session concluded a preliminary evaluation was conducted for all participants, in both groups to gauge their equivalence.

On we inputted the data into a computer. Utilized the SPSS software for analysis purposes. We calculated both means and standard deviations of student performance, in their pre-test in order to ascertain if there existed any variations in scores, between the two groups. A t test was carried out with a significance level set at ($p \leq 0.05$) at the start of applying it.

Table 3 shows that there were no variations, between the two groups, in terms of the assessed skills (fluency, flexibility, originality, and overall tool performance) since all t values and significance levels exceeded 0.05. This finding implies that the two groups were equivalent prior to the implementation of gamified learning. Consequently, any future changes in performance can be attributed to the impact of gamified learning rather than initial differences between the groups.

Table 3. Pre-Test Results for Assessing Equivalence Between Experimental and Control Groups.

Creative Reading skills	Group	No.	Mean	Standard Deviation	T Value	Degrees of Freedom	Significance Level
Fluency Skills	Experimental	52	2.01	1.53	1.05	102	0.355
	Control	52	2.06	1.55			
Originality Skills	Experimental	52	2.37	1.58	0.85	102	0.568
	Control	52	2.45	1.57			
Flexibility Skills	Experimental	52	1.24	1.29	0.68	102	0.673
	Control	52	1.17	1.27			
Overall Skills	Experimental	52	5.62	2.85	1.95	102	0.462
	Control	52	5.68	2.83			

Based on the results displayed and in accordance with the established timeline, the study was conducted over six weeks, encompassing four class sessions each lasting 45 minutes, culminating in a total of 44 sessions. The gamified learning strategy was implemented as planned. After the help session ended, the students' skills to understand what they read were assessed in both groups using the approach used before.

The information was then inputted into the computer for analysis using the Statistical Package, for Social Sciences (SPSS). To address the research questions posed, means and standard deviations of the students' scores in the creative reading skills test were calculated for both groups. Additionally, T-test analyses were conducted on the post-test results in creative reading skills, and a one-way ANOVA was performed to examine differences in creative reading skills based on the school type variable within the experimental group.

3. Results

3.1. Results of the First Question

The primary aim of the first research question was to find out the effectiveness of the gamification-based learning in enhancing creative reading skills among the second-grade students. The study aimed to determine whether there were statistically significant differences at the level of ($p \leq 0.05$) between the average performance of the experimental group and the control group in various creative reading skills, as well as the overall test performance. The comparison was between the gamification-based learning and the traditional teaching method. To assess these differences, a t-test was used to analyse the post-test results, as shown in **Table 4**.

Table 4. T-test Analysis of Post-Test Results in Creative Reading Skills.

Creative Reading Skills	Group	No.	Mean	St. Dev.	T	df.	Sig.
Fluency Skills	Experimental	52	18.81	1345	6.012	102	0.007
	Control	52	12.75	1.934			
Originality Skills	Experimental	52	16.89	1.132	7.045	102	0.000
	Control	52	11.23	1.974			
Flexibility Skills	Experimental	52	16.23	1.113	12.556	102	0.001
	Control	52	10.82	1.867			
Overall Skills	Experimental	52	17.18	1.237	11.456	102	0.002
	Control	52	12.84	2.823			

The results in **Table 4** clearly indicate that gamification-based learning significantly enhances various creative reading skills among second-grade students compared to traditional teaching methods. Specifically, the experimental group outperformed the control group in fluency, originality, and flexibility skills, with all comparisons yielding statistically significant differences at ($p \leq 0.05$ (. These results give an indication that that integrating gamification into the learning process not only improves reading proficiency but also fosters creativity and adaptability in students' reading strategies, highlighting its effectiveness as a pedagogical approach.

3.2. Results of the Second Question

The aim of this question is to determine whether there are statistically significant differences at the significance level ($p \leq 0.05$) between the mean performances of individuals in the experimental group in the creative reading skills test, attributed to differences in the type of school (government school using the national curriculum, private school using the national curriculum, or private school using the international curriculum) to which the student belongs. To achieve this goal, the means and standard deviations for the school type variable were calculated, as shown in the **Table 5**.

Table 5. Means of the Study Sample Individuals by School Type Variable.

Creative Reading Skills	The Type of School	No.	Mean	St. Dev.
Fluency Skills	Public School using the National Curriculum	15	17.76	0.991
	Private School using the National Curriculum	18	16.53	0.731
	Private School using the International curriculum	19	17.05	0.989
	Overall	52	16.94	1.078
Originality Skills	Public School using the National Curriculum	15	1523	0.864
	Private School using the National Curriculum	18	14.62	1.001
	Private School using the International curriculum	19	15.67	1.045
	Overall	52	16.77	0.545
Flexibility Skills	Public School using the National Curriculum	15	16.00	0.971
	Private School using the National Curriculum	18	15.78	1.007
	Private School using the International curriculum	19	15.99	1.210
	Overall	52	16.20	0.565
Overall Skills	Public School using the National Curriculum	15	16.75	0.978
	Private School using the National Curriculum	18	14.97	1.007
	Private School using the International curriculum	19	16.56	1.145
	Overall	52	16.23	1.756

Table 5 provides a comprehensive overview of the means and standard deviations of creative reading skills among students in the experimental group, categorized by the type of school they attended. The analysis focuses on three key dimensions of creative reading skills: fluency, originality, and flexibility, along with an overall performance measure.

Beginnings with fluency skills, the mean scores indicate that public school students (17.76) outperformed their peers in private schools (16.53) and international schools (17.05). The standard deviations suggest that public school students exhibited relatively consistent performances (0.991), whereas private school students showed slightly greater variability (0.731). This pattern implies that public school students, who engage with the national curriculum, may benefit more from gamified learning activities in developing their fluency skills compared to their counterparts in private and international schools.

In terms of originality skills, public school students again achieved the highest mean score (15.23), followed closely by international school students (15.67) and private school students (14.62). The lower mean score for private school students suggests they may struggle more with originality in their creative reading compared to those in public and international schools. Additionally, the standard deviations indicate that originality performances in public schools were less variable (0.864) than those in private schools (1.001), highlighting a more uniform development of originality skills among public school students.

Examining flexibility skills, the mean scores across different school types are relatively comparable. Public schools slightly lead with a score of 16.00, followed by international schools at 15.99 and private schools at 15.78. The standard deviations are similar across the groups, indicating consistent variability in performance. This proximity in mean scores suggests that flexibility in creative reading may be less influenced by the type of school attended and more dependent on individual student engagement with gamified learning activities.

When looking at overall performance in creative reading skills, public schools again report the highest mean score of 16.75, followed by international schools at 16.56 and private schools at 14.97. This relatively higher score for public school students underscores the effectiveness of gamified learning activities in fostering comprehensive reading skills. Furthermore, the standard deviations reveal that public school students had a more consistent performance (0.978), while private schools exhibited the greatest variability (1.007). Such variability could reflect disparities in how gamification is implemented or perceived among private school students. To determine whether the differences in creative reading skills among the subjects of the experimental group, based on the type of school attended, are statistically significant, a one-way ANOVA

was conducted.

Table 6 presents the results of a one-way ANOVA conducted to assess whether there are statistically significant differences in creative reading skills among the subjects of the experimental group based on the type of school they attended. The analysis focuses on four key dimensions of creative reading skills: fluency, originality, flexibility, and overall reading comprehension levels.

Table 6. One-Way ANOVA - Differences in Creative Reading Skills by School Type Variable in the Experimental Group.

Creative Reading Skills	Source of Variation	Sum of Squares	Mean Squares	df.	F Value	Sig.
Fluency Skills	Between Groups	44.347	18.365	50	1.645	0.834
	Within Groups	414.569	11.787			
Originality Skills	Between Groups	35.426	18.991	50	1.322	0.757
	Within Groups	638.156	12.987	50		
Flexibility Skills	Between Groups	24.382	15.294	50	0.987	0.678
	Within Groups	558.646	12.898	50		
Overall Reading Comprehension Levels	Between Groups	126.768	48.989	50	1.032	0.608
	Within Groups	157.137	36.759			

The ANOVA results for fluency skills indicate an F value of 1.645, accompanied by a significance level (p-value) of 0.834. This p-value is considerably higher than the common alpha level of 0.05, suggesting that there are no statistically significant differences in fluency skills among the different school types. Although the sum of squares between groups is 44.347, reflecting some variation in performance, the overall lack of significance implies that the type of school does not impact fluency skill development within the experimental group.

In terms of originality skills, the analysis reveals an F value of 1.322 and a significance level of 0.757. This p-value once again indicates that there are no statistically significant differences among the school types. The sum of squares between groups is 35.426, which shows some variability in scores; however, the results suggest that the type of school attended does not meaningfully influence students' originality in creative reading skills.

Regarding flexibility skills, the ANOVA results yield an F value of 0.987 and a significance level of 0.678. Consistent with the previous dimensions, these findings indicate no statistically significant differences among the school types. The sum of squares between groups is 24.382, reflecting some differences in performance, but the lack of significance suggests that the learning context does not play a critical role in developing flexibility in creative reading.

Finally, the analysis of overall creative reading skills shows an F value of 1.032 and a significance level of 0.608. These results further confirm that there are no statistically significant differences among the types of schools regarding overall reading comprehension. While the sum of squares between groups is 126.768, indicating some variability, the significance level suggests that these differences are not meaningful within the context of this study.

4. Discussion

The results indicate that gamified learning profoundly positively impacts the development of students' creative reading skills. Integrating games into the learning environment leads to a qualitative change in how students understand and engage with texts. Findings from the first research question demonstrate that gamification effectively enhances linguistic fluency, enabling students in game-supported learning environments to read texts more smoothly. This improvement can be attributed to the interactive reading challenges presented by games, which motivate students to practice reading in novel and exciting contexts. Such environments transform reading from a mechanical task into a pleasurable activity, thereby increasing students' willingness to develop their reading skills.

These findings provide practical evidence that incorporating games into the learning context creates an engag-

ing atmosphere for repeated reading practice in diverse situations. This enhancement not only improves fluency but also associates reading with positive experiences. Games present enjoyable challenges, making reading part of an interactive experience, which may be more appealing to students than traditional methods. This motivation likely plays a key role in effecting a qualitative shift in students' perceptions of reading. According to what was mentioned by educationalists [27, 29, 31, 38-41], using games in education enhances reading fluency by fostering a learning environment characterized by motivation and challenge. The results indicate that students learning in game-supported environments exhibit a higher capacity for fluent reading, as games necessitate repetitive practice and the application of skills in various contexts, thereby enriching the reading experience.

Additionally, the results from the first research question indicate that gamified learning positively impacts the originality of students' linguistic expression through the generation of new ideas and unique responses to texts. The study findings suggest that originality in reading involves engaging with texts beyond surface-level understanding, offering new interpretations and innovations that enrich the reading experience. This type of interaction enhances students' ability to express themselves and is vital for developing their creative skills. This outcome is attributed to gamified learning's role in motivating students to generate new ideas, transforming reading into an interactive process that fosters critical and creative thinking skills. Such interaction allows students to transcend superficial understanding and encourages them to develop unique interpretations that reflect a deeper comprehension of the texts. The ability to think critically is essential in our information age. These results align with previous studies [1, 2 27, 29, 31, 39, 40, 42-45], which confirmed that gamification makes students feel personally invested in the learning process, leading to increased engagement with texts through active learning - vital for enhancing deep comprehension. Moreover, the findings accord with previous researches [3, 4, 5, 20-23, 25, 28, 29, 31, 46, 47] study, indicating that gamification contributes to developing deep understanding skills, allowing students to provide innovative and unique interpretations of texts that reflect their original thinking.

The results further indicate that gamified learning enhances linguistic flexibility, as students adapt to new concepts and explore texts from multiple perspectives. Providing a flexible learning environment encourages students to think from different viewpoints, aiding in the development of adaptability and innovation skills. Flexibility is a hallmark of problem-solving ability, enabling students to assimilate lessons and adjust to new situations, both in reading and other life areas. Researchers emphasize the importance of flexibility fostered by gamified learning environments, as it enhances students' capacity to adapt to new concepts and tackle various challenges. This approach encourages students to explore texts from multiple angles, demonstrating that learning extends beyond received information to encompass creative thinking and innovative solutions. Developing these skills is a significant milestone in preparing students to face challenges outside the classroom. These findings resonate with what mentioned by educationalists [3, 20, 21, 26, 41, 42, 48, 49], who confirmed that gamified learning enhances students' ability to adapt to new concepts. The role of gamification in creating a flexible learning environment enables students to explore texts from various perspectives, thereby enhancing critical thinking and problem-solving skills.

Regarding the second research question, the results reveal no statistically significant differences in students' acquisition of creative reading skills across its different aspects (fluency, originality, and flexibility) attributable to the type of school attended. This finding indicates that gamified learning is not influenced by students' educational backgrounds and results in a considerable convergence in students' levels of creative reading skills. This underscores the importance of integrating gamified strategies into all learning settings, regardless of school type or context.

Moreover, the results highlight the necessity of developing a learning environment that stimulates all students to participate and engage. These strategies can promote equality in learning opportunities, helping students reach their full potential. Creating an interactive and engaging learning environment is an effective approach to addressing the challenges that traditional classrooms may encounter. This finding supports the overarching concept of inclu-

sive education, where students from diverse backgrounds can benefit from innovative teaching methods. The results also emphasize the importance of establishing a learning environment that encourages participation and interaction, which is fundamental. Providing equal opportunities for all students to engage in learning fosters educational equity, enabling them to realize their full potential. Enhancing gamified learning can be a crucial strategy for improving educational quality.

5. Conclusions, Recommendations, Limitations, and Future Research Directions

This research concludes that gamified learning significantly improves creative reading skills among early childhood education students. The results indicate that integrating gamification into the learning environment not only boosts fluency but also enhances the originality and quality of students' responses during their interactions with reading texts. By presenting new challenges within an innovative learning framework, students' passion for reading increases, which in turn deepens their comprehension of linguistic concepts. More importantly, the absence of statistically significant differences in the effectiveness of gamified learning across different schools suggests that these strategies are universally applicable in various learning settings. Therefore, gamified learning emerges as a comprehensive and effective approach to improving learning outcomes.

In light of these findings, the authors recommend that educational authorities adopt gamified learning as a core component of linguistic curricula. Investments should be directed towards the development of teaching materials that incorporate appropriate games tailored to different student levels. Furthermore, specialized training programs must be implemented to equip teachers with the skills needed to effectively integrate learning games into their classrooms. These programs should emphasize diverse strategies to cater to the varied needs of all students. Creating engaging and interactive reading environments that promote active participation and enhance students' motivation to learn is also vital. To foster a culture of collaboration and innovation in language learning, workshops and training sessions should be organized for educators to share experiences and best practices related to gamified learning strategies.

However, it is critical to acknowledge several limitations that may influence the study's results. The limited sample size, concentrated solely on students in the capital city of Amman, may restrict the generalizability of the findings. Additionally, the influence of teacher or parental involvement during gamified learning activities was not assessed, which could affect the outcomes. The study's reliance on assessments of creative reading skills may not capture the full spectrum of students' reading abilities. Moreover, the duration of the study might be inadequate to observe long-term changes in reading skills, highlighting the necessity for longitudinal research.

Future research should aim to include a larger sample of students from diverse geographical areas to enhance the generalizability of the findings and to explore the impact of gamified learning in various learning contexts. Investigating students' creative reading attitudes through the lens of their interactions with texts in different settings, such as group projects or mixed classrooms, is also encouraged. Longitudinal studies are needed to track the long-term effects of gamified learning on reading skills, including monitoring students' progress over several years. Furthermore, exploring the influence of gamified learning strategies on other learning competencies, such as critical thinking and creative writing, will be beneficial. These future research endeavors require interdisciplinary collaboration among psychology, education, and educational technology to maximize the comprehensive benefits of these innovative approaches.

By refining these conclusions and recommendations, the study can significantly affect learning practices and policies, particularly in the realm of early childhood education. The insights gained from this research contribute to the ongoing discourse on gamified learning, underscoring its relevance and potential in enhancing learning experiences, especially within primary education in the Arab world.

Author Contributions

R.A.A., O.A.-H., A.A.-B. and B.A. conceptualized the manuscript's focus, proposed the aims, prepared the draft manuscript, and wrote all the sections. R.A.A., O.A.-H., A.A.-B., B.A., E.K., M.A., A.Z., and S.S. Also collected, analyzed, and interpreted the data. R. A. and A..A.-B. were major contributors to writing the manuscript. All authors read and approved the final version of the manuscript.

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Institutional Review Board Statement

The research involving human participants was reviewed and approved by the Deanship of Scientific Research at King Faisal University. All participants provided their written informed consent prior to taking part in the study.

Informed Consent Statement

Informed consent was obtained from all individual participants included in the study.

Data Availability Statement

The authors will make the raw data supporting the conclusions of this article available upon request, without any undue restrictions

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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