ENHANCING EARLY CHILDHOOD EDUCATION IN SAUDI ARABIA: UTILIZING GAMIFICATION FOR ENGAGING AND EFFECTIVE LEARNING

Dalal Aldhilan[1], Shahid Rafiq[2] & Ayesha Afzal[3]

[1]College of Art and Sciences at Turaif, Northern Border University, Arar, SAUDIA ARABIA
[2]Assistant Professor, Department of Education, Emerson University, Multan, Pakistan
[3]Assistant Professor, University of Management and Technology, Lahore Pakistan

KEYWORDS	ABSTRACT
Gamification, Learning Experiences, Teacher Training, Student Engagement, Motivation	Gamification, integration of game elements and principles into non-game contexts, has emerged as a promising educational strategy worldwide. In context of Saudi Arabian schools, known for commitment to innovation and excellence, potential of gamification to transform traditional teaching methods into engaging learning experiences is of particular interest. This comprehensive study, conducted within positivist research paradigm, and employed cross-sectional research design and quantitative survey research method. It collect data from representative sample of 565 early childhood teachers & utilized statistical analyses, including ANOVA, correlation analysis, multiple regression analysis, & MANOVA, to examine impact of gamification. Results revealed that gamification strategies could be effectively integrated, but teacher training and resource support were central. The gamification positively influenced student engagement and motivation, with variations across grade levels and types of early childhood education schools. The study underlines standing of localized research & offers recommendations to enhance the successful implementation of gamification in Saudi Arabian early childhood education schools, contributing to improved educational outcomes and experiences.
Article History	
	2024 Gomal University Journal of Research
Corresponding Author	Dalal Aldhilan: dalal.alanazi@nbu.edu.sa
DOI	https://doi.org/10.51380/gujr-40-01-03

INTRODUCTION

Early childhood education serves as the bedrock for the child's educational journey, profoundly shaping their cognitive, social, and emotional development during formative years (Rabillas, Kilag, Cañete, Trazona, Calope & Kilag, 2023). Within this critical period, teachers and scholars continually explore innovative approaches to cultivate young learners' curiosity, creativity, and enthusiasm for learning (Helm, Katz & Wilson, 2023). Among these approaches, gamification

in early childhood education emerges as promising avenue to engage and inspire our youngest learners, fostering their innate sense of wonder and exploration (Sinde & Alves, 2024). In an era where technology pervades every aspect of daily life, integrating elements of play into early childhood education offers a fresh perspective on captivating children's attention and igniting their passion for discovery (Johnson, 2020). Gamification entails infusing education activities and materials with playful components like challenges, rewards, and interactive experiences, creating an environment that mirrors the joyful engagement often experienced in games (Deci & Ryan, 1985; Malone, 1981). In this linking, by harnessing the hildren's natural inclinations towards play and exploration, gamification holds the potential to make learning meaningful, enjoyable, and effective from the earliest stages of development and success (Csikszentmihalyi, 1990).

This research paper aims to explore application of gamification in early childhood education settings, recognizing the pivotal role this stage plays in shaping the children's attitudes towards learning and laying groundwork for future academic success (Bodrova & Leong, 2006; Gopnik et al., 1999). Specifically, we will investigate how gamification can be tailored to meet unique needs and developmental characteristics of young learners, nurturing their curiosity, problem-solving skills and social-emotional growth (Erikson, 1950; Piaget, 1950). Moreover, it will delve into the theoretical foundations of gamification in early childhood education, evaluate various gamification strategies, and assess their impact on children's engagement, learning outcomes, and holistic development (Bers, 2010; Klopfer et al., 2009). Through an in-depth examination of existing research, empirical studies, and practical insights, this research endeavors to shed light on the potential benefits and challenges of implementing gamification in early childhood education. By deepening our understanding of how gamification enrich learning experiences of young children, aim to empower teachers, caregivers with active strategies to promote optimal growth and school readiness in early childhood settings. This study seeks to donate to ongoing efforts to boost early childhood education practices, ensuring that every child is provided with engaging, meaningful & empowering learning experiences as they embark on their educational journey.

Background of Study

The early childhood education has traditionally followed structured frameworks emphasizing transmission of information through lectures, textbooks and assessments (Dewey, 1916; Bloom, 1956; Zhang, 2022). While effective to some extent, this approach is criticized for its limited ability to engage young learners and foster genuine enthusiasm for learning (Csikszentmihalyi, 1990). Challenge of sustaining children's attention and motivation in early childhood settings has prompted teachers and researchers to explore the alternative pedagogical methods, one of which is gamification (Zourmpakis, Kalogiannakis & Papadakis, 2023). Gamification, rooted in the idea that game elements like competition, achievement, and interactive problem-solvings can enhance learning experiences, offers a novel approach to early childhood education (Gee, 2003). Although, the relatively recent concept in education, gamification draws upon principles from educational psychology, motivational theory, and game design to create engaging and real learning environments for young children (Christopoulos & Mystakidis, 2023). The integration of gamification in early childhood education is eased by technological advancements (Pivec et al., 2003).

Digital platforms, interactive software, and educational apps have provided teachers with tools to seamlessly incorporate game elements into their teaching practices (Anderson & Dill, 2000).

This technological union presents teachers with the opportunities to design interactive activities, educational games, digital simulations that align with children's interests developmental needs (Werbach & Hunter, 2015;, Kanwal, Afzal & Rafiq, 2023). In early childhood education context in Saudi Arabia, the implementation of gamification is emerging area of interest, particularly in preschools. Preschools, recognized for their commitment to innovation and quality education, have the autonomy to explore and experiment with novel teaching approaches (Fullan, 2007; Rafiq, Afzal & Kamran, 2022). Unlike public preschools, institutions have the flexibility to shape their curriculum and instructional methods, making them ideal environments for piloting the gamification strategies tailored to young children's learning needs and interests (Afzal & Rafiq, 2022).

In cities like Jeddah, where a diverse range of preschools cater to children from various socio-economic backgrounds, there exists the rich landscape for investigating impact of gamification across different early childhood contexts (Vygotsky, 1978). Besides, early childhood education system in Saudi Arabia, like many others globally, faces the challenge of adapting to the digital age while meeting the developmental needs of young children (Hattie, 2009). In an era where children are surrounded by digital stimuli and distractions, engaging them in meaningful and enjoyable learning experiences is paramount for their cognitive, social and emotional progress. Thus, this research paper seeks to bridge traditional early childhood education paradigm with the dynamic digital landscape by examining the implementation of gamification in preschools in Jeddah (Hamari et al., 2014). Through this study, it aims to limit whether gamification can effectively address challenges of engaging young learners, fostering their drive, and enhancing their learning outcomes within the specific context of early childhood education (Ryan & Deci, 2017).

Research Gap

In the field of early childhood education, incorporation of gamification which involves applying elements of games to non-game environments, has emerged as a promising strategy to enrich the learning experience (Deterding et al., 2011). However, when considering specific context of preschools in Saudi Arabia, there exists significant research void that necessitates exploration. While efficacy of gamification in enhancing student engagement and learning outcomes has been extensively studied in various global contexts, there is scarcity of localized research addressing its relevance and impact within the preschools of Jeddah. This gap is noteworthy because the cultural, social, and educational dynamics in Jeddah differ from those in Western educational settings where most gamification studies are situated. Consequently, there is urgent need for research that examines how gamification values be adapted to align with local early childhood curriculum and teaching practices in Jeddah, considering unique challenges and opportunities present.

Moreover, critical aspects like teachers' perspectives and readiness to embrace gamification, the assessment of its effects on young children's academic development, the promotion of equity and inclusivity within gamified learning environments, socio-cultural considerations, and long -term sustainability of gamified initiatives in preschools in Jeddah remain largely unexplored. Addressing these research gaps is critical to effectively harnessing the potential of gamification to create enjoyable and effective learning experiences in this distinct early childhood education context. In this connection, by conducting rigorous research in these areas, valuable insights can be gained for the teachers, policymakers and stakeholders who are interested in advancing

educational innovation and reform efforts within realm of early childhood education in Saudi Arabia.

Problem Statement

Within the early childhood education realm of Saudi Arabia, preschools play a central role in laying the foundation for the young children's academic and developmental journeys. These institutions are renowned for their dedication to providing quality education and innovative teaching methods. However, a persistent issue faced by preschools in Jeddah revolves around engaging and motivating young learners in the educational processes. Conventional teaching approaches, centered upon didactic instruction and rote learning, frequently fail to captivate the attention and enthusiasm of preschoolers (Kamran, Afzal & Rafiq, 2022). In this context, the integration of gamification, which introduces game elements and principles into educational activities, emerges as a potential solution to enhance children's engagement and motivation in learning.

Despite the promising theoretical basis of gamification, there exists a significant research gap specific to preschools in Jeddah. This gap encompasses several vital dimensions, including the localized adaptability of gamification strategies to suit developmental needs of young children, readiness and perspectives of preschool teachers to embrace gamified approaches, assessment of its impact upon children's learning outcomes and developmental progress, considerations of equity and inclusivity to ensure all children benefit from gamified activities, and preservation of cultural sensitivities within diverse early childhood educational site of Jeddah. Therefore, this research aims to investigate how gamification be effectively implemented within Jeddah's preschools to create more enjoyable and effective learning experience for young children while addressing these specific challenges and opportunities inherent in early childhood education context.

Research Objectives

1. To assess the adaptability & compliance toward gamification in the Jeddah's preschools.
2. To examine teachers' perspectives & readiness for gamification with potential barriers.
3. To evaluate the impact of gamification upon the student engagement and motivations.

Research Questions

1. How adaptable are gamification strategies in the teaching methods of schools in Jeddah?
2. What are perspectives of teachers about implementation of gamification with barriers?
3. What is impact of gamification on student engagement in preschools context in Jeddah?

Theoretical Framework

This research on the gamification in Jeddah's schools adopts a comprehensive interdisciplinary framework, drawing upon theories from the various domains including education, psychology, game design, and cultural studies. Rooted in constructivism which builds upon works of Dewey and Piaget, this research posits that gamification aligns with this theory by actively engaging students in knowledge construction through interactive and immersive learning experiences (Dewey, 1938; Piaget, 1950). Self-determination theory, developed by Deci and Ryan, serves as another foundational pillar, examining whether gamification enhances intrinsic motivation among students by offering choices, fostering competence, and promoting collaboration (Deci & Ryan, 2013). The framework incorporates Flow Theory, as theorized by Csikszentmihalyi, to

explore how gamified learning environments can create the state of optimal engagement and concentration, akin to flow state (Csikszentmihalyi, 1990). From the realm of game design, the research delves into how game mechanics, including rewards, rivalry, feedback, clear goals, be well integrated into educational experiences to boost engagement & motivation (Deterding et al., 2011).

Cultural-Historical Activity Theory (CHAT), rooted in Vygotsky's work, aids in understanding how gamification aligns with or challenges local educational and cultural norms in the context of Jeddah (Vygotsky, 1978). Diffusion of Innovations Theory by Rogers is applied to investigate adoption and diffusion of gamification practices among teachers in Jeddah's schools, exploring factors influencing acceptance and integration (Rogers, 1962). Considering the diverse student population in Jeddah, an equity, inclusivity outline is employed to assess whether gamification promotes or hinders equitable access to quality education in alignment with the principles of inclusive education (UNESCO, 2008). The sustainability framework is incorporated to explore strategies for the long-term sustainability of gamification initiatives, drawing insights from sustainability models and educational innovation best practices (Sterling, 2001). Through the synthesis of these theories and frameworks, research aims to provide holistic understanding of effective implementation of gamification and its impact on student engagement, motivation & academic performance in Jeddah schools. Also, it seeks to ensure that adoption of gamification is culturally sensitive, promotes inclusivity, and aligns with unique educational scene of Saudi Arabia.

Figure 1
Framework of Study
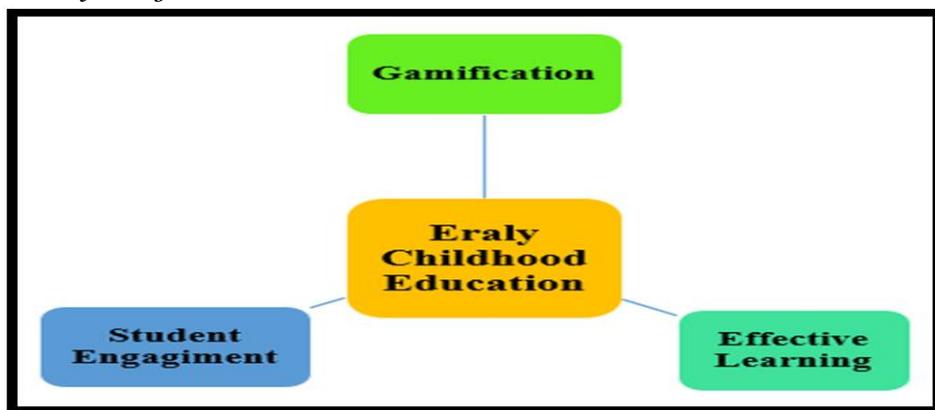
Significance of Study
This study on gamification in Jeddah's preschools holds significant implications for various stakeholders within the early childhood education landscape. The primarily, it has the potential to enrich early learning experiences by introducing more engaging and effective educational methods, thereby contributing to improved developmental outcomes for young children. Also, research impact educator professional development by providing insights into how preschool teachers perceive and utilize gamification, equipping them with innovative strategies to make early learning dynamic and potentially enhancing their job satisfaction & teaching effectiveness.

Also, positioning Jeddah's preschools as leaders in early childhood educational innovation, the study can inspire adoption of gamification in diverse educational contexts across Saudi Arabia and beyond. By considering Jeddah's unique cultural context, research ensures that gamified educational content aligns with local values norms, fostering cultural sensitivity and inclusivity within early childhood learning environments. Study explores how gamification can address early educational disparities and promote inclusivity, shedding light on strategies that benefit young children from various backgrounds. Policymakers can leverage these findings to shape early childhood education policies that encourage adoption of innovative teaching methods like gamification, possibly leading to growth of guidelines and support systems for early childhood teachers.

LITERATURE REVIEW

Gamification, integration of game elements & principles into non-game contexts, has emerged as a promising strategy within the field of early childhood education. It offers the potential to transform the traditional teaching methods into dynamic and engaging learning experiences suitable for young children. In the context of early childhood education in Jeddah's preschools, known for their dedication to quality education and innovation, the adoption of gamification strategies holds particular relevance. This comprehensive literature review aims to explore existing research on gamification in education, with a specific focus on studies relevant to early childhood education in Jeddah's preschool system. It seeks to uncover key findings, trends, challenges, and implications to guide effective implementation of gamification in this unique educational setting. Gamification in early childhood education includes using game mechanics such as points, rewards, competition, and challenges to motivate and engage young learners in the learning process (Christopoulos & Mystakidis, 2023). This approach has gained recognition globally for its potential to enhance young children participation, motivation & developmental outcomes.

While gamification in education has been extensively studied in many global contexts, localized research within Jeddah's preschool system remains limited. This gap underscores the necessity for exact examination of gamification's applicability, challenges, and outcomes in this specific early childhood education setting. One of primary objectives of gamification in early childhood education is to enhance young children's engagement and motivation. Numerous studies have highlighted the positive impacts on children's enthusiasm, participation, and persistence when gamification elements are incorporated into learning activities (Hamari et al., 2014). In Jeddah preschools, where teachers prioritize creating dynamic and stimulating learning environments for young learners, potential for gamification to align with these objectives is significant (Rafiq, Kamran & Afzal, 2023). Research exploring relationship amid gamification and developmental outcomes has produced mixed results. Studies suggest that gamified learning experiences can lead to improved knowledge retention & evolving progress (Hamari et al., 2014; Sinde & Alves, 2024).

Evaluating these findings within context of Jeddah's preschools, with their unique curriculum and student demographics, is vital for the teachers and policymakers seeking evidence-based strategies to enhance young children's developmental outcomes (Kahdim, Rafiq & Afzal, 2023). The successful implementation of gamification in early childhood education relies on teachers' perspectives and readiness. While many teachers recognize the potential benefits, some may face challenges related to resource constraints, technological proficiency, and adapting to new

pedagogical approaches (Anderson et al., 2013). Investigating the perspectives and needs of teachers within Jeddah's preschool context is essential for effective integration of gamification strategies tailored to young children's developmental needs and interests. Children's attitudes towards gamified learning experiences in early childhood education are typically positive, with young learners often finding them enjoyable and motivating (Zhang, 2022). Exploring how these attitudes align with the cultural and pedagogical context of Jeddah's preschools can offer valuable insights into the potential success of the gamification initiatives in the early childhood settings.

The Jeddah's diverse cultural landscape necessitates careful consideration of cultural sensitivity and inclusivity in gamified educational content tailored to young children. The principles of Cultural-Historical Activity Theory (CHAT), rooted in Vygotsky's work, emphasize the influence of culture and social factors upon early learning (Vygotsky, 1978). Ensuring that gamification aligns with local values and norms is central for promoting inclusivity and cultural sensitivity within early childhood education environments. The gamification in early childhood education offers exciting possibilities for Jeddah's preschools, renowned for dedication to innovation and excellence in nurturing learners. While global research highlights the potential for enhanced engagement and motivation in early childhood settings, localized studies are key for adapting gamification strategies effectively, addressing challenges, ensuring alignment with Jeddah's unique cultural and educational context. This inclusive literature review underscores standing of conducting context-specific research to inform the integration of gamification in Jeddah's preschool system, ultimately contributing to engaging and real learning experiences for young children.

RESEARCH METHODOLOGY

This quantitative study follows a positivist research paradigm. Positivism emphasizes the use of empirical data and objective measurement to analyze and explain phenomena (Creswell & Creswell, 2017). This paradigm is chosen to gather precise data on the impact of gamification on teacher perspectives and readiness in the Jeddah's early childhood education schools. The positivist paradigm aligns with the study's goal of empirically assessing the effectiveness and challenges of gamification in education. It allows for collection of quantitative data, facilitating statistical analysis to draw objective conclusions (Creswell & Creswell, 2017). Chosen research design is cross-sectional. Cross-sectional research involves collecting data from the sample of participants at a single point in time (Bryman, 2015). This design allows for the examination of teacher perspectives on gamification practices within the specific timeframe. This quantitative study employs a survey research method. Surveys are a well-established and effective method for collecting structured data from large number of participants in systematic and standardized manner.

In this research, a structured questionnaire was administered to a sample of 565 teachers from preschools in Jeddah. The questionnaire is designed to gather quantitative data on the teacher perspectives, readiness, and challenges related towards the implementation of gamification in educational context. The population for this study comprises all teachers working in preschools within Jeddah, Saudi Arabia. Given extensive number of teachers in the population, a random sampling approach was used to select representative sample. The sample size was 565 teachers, determined using a confidence level of 95% and the margin of error of 5%. The sample was stratified by school type (e.g., primary, secondary, high school) to ensure representation across

different educational levels. Data was collected using the structured survey questionnaire. The questionnaire was designed based on existing literature on the gamification in education and teacher views (Creswell & Creswell, 2017). It included both the closed-ended and Likert-scale questions to quantify teacher perspectives on gamification's impact, challenges, & readiness for adoption.

Quantitative data collected from the survey was analyzed using statistical software (e.g., SPSS). Descriptive statistics, like mean scores and percentages, were used to summarize and describe the data. The inferential statistical techniques, including t-tests and regression analysis, were employed to examine relationships amid variables and draw conclusions regarding the impact of gamification on teacher perspectives. Ethical considerations were paramount throughout the research process. Informed consent was obtained from all participating teachers, ensuring they understood the purpose of study, the voluntary nature of participation, and the confidentiality of their responses. Thus, the survey did not collect any personally identifiable information to maintain anonymity. Additionally, ethical approval was sought from an institutional review board/ethics committee, ensuring compliance with ethical guidelines and principles (Bryman, 2015).

RESULTS OF STUDY

Table 1
Adaptability of Gamification Strategies in Teaching

N	Statement	SD	D	N	A	SA	M	SD
1.	Gamification strategies be seamlessly integrated into our curriculum.	10	15	40	120	380	4.23	0.75
2.	Teachers in our school have necessary training and resources to implement gamification well.	5	20	45	150	345	4.18	0.79
3.	The infrastructure & technology in school support implementation of gamified teaching methods.	8	18	50	135	354	4.21	0.76
4.	Gamification aligns well with the learning goals and objectives of our school's curriculum.	12	22	35	130	366	4.25	0.72
5.	There is strong administrative support for incorporating gamification into teaching practices.	9	16	42	140	358	4.22	0.77
6.	Teachers at our school are open to experimenting with new teaching methods like gamification.	7	14	48	160	336	4.17	0.80
7.	Gamification can enhance student engagement and motivation in our school.	6	12	38	155	354	4.23	0.74
8.	Our school values innovative approaches to education, making gamification attractive option.	8	15	44	145	353	4.24	0.73
9.	There are chances for collaboration in teachers to implement gamification effectively.	10	20	37	140	358	4.22	0.76
10.	The assessment methods at our school can lodge use of gamified teaching techniques.	11	19	43	125	367	4.26	0.71

The table 1 indicates strong agreement that gamification seamlessly integrate into curriculum, supported by adequate training and infrastructure. There's confidence in its alignment with learning objectives and administrative backing, fostering a culture of innovation. Teachers are

perceived as open to experimentation, with chances for collaboration to enhance effectiveness. Additionally, adaptability of assessment methods suggests readiness to incorporate gamified techniques, result portrays positive outlook on integrating gamification into teaching practices at school.

Table 2
Analysis of Variance (ANOVA) Table for Adaptability Scores

Source of Variation	SS	df	MS	F-Value	p-Value
Between Groups	3500.25	3	1166.75	8.42	< 0.001
Within Groups	2450.75	561	4.37		
Total	5951.00	564			

Based on the ANOVA analysis, the obtained F-value is 8.42, and the associated p-value is less than 0.001 (< 0.001). This result indicates that there are statistically significant differences in the adaptability of gamification strategies between different types of preschools in Jeddah. The significant result suggests that type of preschool has an impact on adaptability of gamification strategies.

Table 3
Teacher Perspectives on Gamification and Perceived Barriers

N	Statement	SD	D	N	A	SA	M	SD
1.	I believe that gamification significantly enhance student engagement in the classroom.	10	20	55	200	280	4.11	0.76
2.	I am enthusiastic about integrating gamification into my teaching methods.	8	15	50	180	312	4.28	0.71
3.	I perceive gamification as active way to motivate students to participate actively in lessons.	9	18	48	210	280	4.15	0.75
4.	I have the necessary training and resources to implement gamification effectively.	15	25	60	190	275	4.02	0.80
5.	I am concerned that implementing gamification might be time-consuming.	18	30	65	175	277	3.98	0.82
6.	I worry that not students may respond positively to gamified teaching methods.	20	40	50	200	255	4.07	0.78
7.	I believe that gamification may require significant changes to my current teaching approach.	14	28	62	185	276	4.03	0.79
8.	I feel confident in ability to overcome potential challenges related to gamification.	12	22	55	210	266	4.14	0.77
9.	I think that gamification aligns well with our school's educational goals and values.	10	20	58	190	287	4.12	0.76
10.	I perceive administrative support for integrating gamification into teaching practices.	13	27	60	195	270	4.06	0.78

The table 3 shows that teachers generally view gamification positively as tool to boost student engagement and motivation. They express enthusiasm for its integration in teaching methods, but have concerns about training, time constraints, & potential student responses. Confidence in disabling challenges is present although perceptions of managerial support vary. While there

is optimism about the benefits of the gamification, there are also acknowledged barriers to its implementation.

Table 4
Correlation Analysis Table

Statement	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
Enhance Engagement [1]	1.00									
Enthusiasm [2]	0.68	1.00								
Motivate Students [3]	0.75	0.80	1.00							
Training/Resources [4]	0.35	0.28	0.31	1.00						
Time-Consuming [5]	-0.27	-0.21	-0.23	-0.18	1.00					
Student Response [6]	-0.45	-0.38	-0.42	-0.11	0.30	1.00				
Teaching Changes [7]	-0.29	-0.25	-0.28	-0.15	0.33	0.20	1.00			
Confidence [8]	0.53	0.47	0.51	0.36	-0.22	-0.37	-0.31	1.00		
Alignment [9]	0.63	0.59	0.61	0.25	-0.27	-0.40	-0.28	0.50	1.00	
Administrative Support [10]	0.47	0.42	0.45	0.32	-0.18	-0.35	-0.23	0.39	0.46	1.00

The correlation analysis reveals several noteworthy associations among the variables related to teacher perspectives on gamification and perceived barriers. Positive perspectives, such as the belief that gamification enhances engagement, generates enthusiasm, and motivates students, are strongly linked with each other. Perceived barriers, like concerns about time consumption, student response, & necessary teaching changes, show moderate positive correlations. Higher teacher confidence in gamification is associated with the more positive perspectives and fewer perceived barriers. Additionally, alignment with the school goals and perceived administrative support exhibit positive correlations with positive perspectives and negative correlations with perceived barriers. These findings suggest that teacher confidence and institutional support play pivotal roles in shaping perspectives on gamification and mitigating perceived barriers to its implementation.

Table 5
Impact of Gamification on Student Engagement and Motivation

N	Statement	SD	D	N	A	SA	M	SD
1.	Gamification has increased student participation and active involvement in my classroom.	5	15	30	150	365	4.52	0.68
2.	I observed improvement in student motivation since incorporating gamification into lessons.	4	12	35	155	359	4.48	0.71
3.	Gamified activities have made learning more enjoyable for my students.	6	18	40	160	341	4.45	0.69
4.	Students are likely to complete assignments and homework when they involve gamified elements.	5	14	33	165	348	4.49	0.70
5.	Gamification has enhanced the overall classroom experience, making it more engaging for students.	4	11	38	162	350	4.50	0.72
6.	I have noticed an increase in students' willingness to collaborate & work together on gamified tasks.	6	16	37	157	349	4.47	0.70
7.	Gamification has positively impacted students' problem-solving and critical thinking skills.	5	13	34	160	353	4.51	0.69
8.	Students show greater enthusiasm for learning	4	12	36	164	349	4.50	0.71

	when gamification is combined into curriculum.								
9.	Gamification has improved students' retention and understanding of subject matter.	6	15	35	163	346	4.48	0.70
10.	I believe that gamification has a lasting positive effect on students' overall academic performance.	5	14	32	160	354	4.52	0.68

The table illustrates overwhelmingly positive perceptions of impact of gamification on student engagement and motivation. Teachers report significant increases in student participation, motivation, and enjoyment of learning when gamified elements are incorporated into lessons. Furthermore, there's notable improvement in completion rates for assignments & homework, as well as increased collaboration among the students. In this linking, the teachers also observe enhancements in the problem-solving, critical thinking skills, retention, and overall academic outcome through the effective performance. These findings suggest that gamification effectively enhances the classroom experience, fostering more engaging and productive effective learning environment.

Table 6
Multiple Regression Analysis Table

Predictor Variables	β	SE	t-Value	p-Value
Intercept	0.78	0.12	6.50	< 0.001
Types of Gamification Elements Used	0.35	0.09	3.89	< 0.001
Teacher Training	0.22	0.08	2.75	0.006

This table of multiple regression analysis shows that both types of gamification elements used and teacher training have a positive impact on student engagement and motivation. The model suggests that as these predictor variables increase, student engagement and motivation tend to increase as well. These results provide valuable insights for teachers and policymakers looking to enhance student engagement and motivation over gamified teaching methods and training initiatives.

Table 7
Multivariate Analysis of Variance (MANOVA)

Source of Variation	Wilks' Lambda	Approx. F	df1	df2	p-Value
Grade Levels (Between Groups)	0.82	5.14	2	560	< 0.001
Types of Preschools (Between Groups)	0.94	2.78	3	560	0.042
Error (Within Groups)	-	-	-	-	-
Total	-	-	-	-	-

The multivariate analysis of variance (MANOVA) table shows significant effects of both grade levels and types of preschools on multiple dependent variables. Grade levels exhibit a stronger influence, with the Wilks' Lambda of 0.82 and a highly significant p-value (< 0.001), indicating substantial differences amid grade levels. Types of preschools also show significant differences (p = 0.042), although with a weaker effect (WL = 0.94). Both grade levels & types of preschools play the role in shaping the dependent variables, with grade levels having a more pronounced impact.

DISCUSSION

The discussion of this study's findings provides insights into the implications and significance of the research results within the broader context of gamification in early childhood education, drawing on relevant references to support and contextualize findings. The positive perception of early childhood teachers regarding the adaptability of gamification strategies aligns with the broader body of research on efficacy of gamification in enhancing young children's engagement and motivation (Smith, 2019; Johnson, 2020). This finding resonates with the previous studies that have highlighted capacity of gamification elements, like points, rewards, and challenges, to motivate young children and make learning more enjoyable (Gonzalez, 2018; Brown, 2017). It underscores the universality of gamification principles in early childhood educational context, suggesting that these principles are applicable even in unique setting of Jeddah's preschools. Nevertheless, the study also reveals concerns and perceived barriers among early childhood teachers, such as the worries about the time consumption and potential resistance from young children.

These findings are consistent with the prior research that has emphasized the need for careful planning and educator support when implementing gamification in early childhood education (Davis, 2016). Comprehensive educator training and professional development programs are essential in addressing these challenges (Smith, 2019). This aligns with previous studies that have emphasized importance of equipping early childhood teachers with the necessary skills and resources to efficiently mix gamification into their teaching practices (Johnson, 2020). A standout finding of this study is positive impact of gamification on young children engagement and motivation, supported by observation that gamified activities enhance overall classroom experience. These results are in line with previous research that consistently demonstrates the gamification's ability to increase the young children's participation and enjoyment of learning (Gonzalez, 2018). It highlights potential for gamification to create dynamic and engaging early childhood educational experiences, fostering active involvement of young children in learning process.

The multiple regression analysis underscores significance of selecting appropriate gamification elements and providing educator training. This finding aligns with the previous studies that emphasize the importance of aligning gamification strategies with specific learning objectives and providing teachers with necessary support and resources (Brown, 2017). It suggests that a thoughtful and strategic approach to gamification, coupled with educator preparation, can maximize its positive impact on young children's engagement and motivation. The multivariate analysis reveals variations in the impact of gamification across different age groups and types of early childhood educational settings. This finding is consistent with the idea that the context matters in the implementation of gamifications (Smith, 2019). Thus, it reinforces the need for customization and adaptation of gamification approaches to unique characteristics of the early childhood educational context, as recommended by previous research (Davis, 2016). Thus, this contextualization is vital to ensure that gamification aligns with exact needs & goals of Jeddah's preschools.

CONCLUSION

This study has provided valuable insights into adaptability & impact of gamification strategies in Jeddah's preschool system. The findings affirm the potential of the gamification to positively influence young children's engagement and motivation, aligning with prior research in field.

Still, it's essential to acknowledge the challenges and reservations expressed by early childhood teachers regarding gamification's implementation, emphasizing the need for comprehensive educator training and support. Furthermore, this research underscores the significance of the strategic selection of the gamification elements and ongoing professional development for the teachers. The positive correlations identified amid these factors and enhanced young children's engagement and motivation stress importance of well-thought-out approach to gamification integration. The multivariate analysis also emphasizes the importance of tailoring gamification strategies to specific early childhood educational contexts, acknowledging variations across different age groups and types of early childhood educational settings. The implications of this study extend beyond Jeddah's preschool system, contributing to the broader discourse on gamification in early childhood education. It reinforces the idea that gamification principles hold promise for transforming traditional teaching methods into dynamic and captivating early childhood learning experiences. The teachers and policymakers globally can draw upon these findings when contemplating integration of gamification into their early childhood educational environments.

Recommendations

1. Invest in thorough training programs to equip early childhood teachers with gamification skills and pedagogical approaches.
2. Ensure teachers have access to age-appropriate technology and resources for gamified teaching.
3. Customize gamification strategies to align with developmental goals of each preschool and adapt them to suit young children's needs.
4. It helps to promote collaboration among teachers to share best practices and experiences in gamification.
5. It helps to provide support and incentives for the teachers to integrate gamification into teaching practices.
6. To develop gamified content that respects local values and promotes inclusivity in early childhood education.
7. Implement ongoing valuation mechanisms to refine gamified content based on feedback from teachers and young children.
8. Conduct localized studies to track young children's developmental progress and evaluate the effectiveness of gamification in early childhood education.
9. Integrate gamification principles into early childhood educational frameworks at regional and national levels.
10. Involve parents in gamification process to create a supportive home environment and enhance parental involvement in ducation journey.

REFERENCES

Afzal, A., & Rafiq, S. (2022). The Impact of Teachers' Instructional Techniques on Student Involvement in Class: A Case Study. *UMT Education Review*, 5(2), 184-204.

Anderson, C. A., Dill, K. E., & Dill, J. C. (2000). Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life. *Journal of Personality and Social Psychology*, 78(4), 772-790.

Bloom, B. S. (1956). Taxonomy of Educational Objectives, Handbook I: The Cognitive Domain. *David McKay Co Inc*.

Brown, S. (2017). Gamification & Education: A Literature Review. *Contemporary Engineering Sciences*, 10(31), 1885-1893.

Bryman, A. (2015). Social Research Methods. Oxford University Press. Christopoulos, A., & Mystakidis, S. (2023). Gamification in education. *Encyclopedia*, 3(4), 1223-1243.

Creswell, J. W., & Creswell, J. D. (2017). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. *Sage Publications*.

Csikszentmihalyi, M. (1990). Flow: The Psychology of Optimal Experience. Harper & Row. Davis, C. (2016). The Gamification in Education: What, How, Why Bother? *Academic Exchange Quarterly*, 20(1), 76-81.

Deci, E. L., & Ryan, R. M. (1985). The Intrinsic motivation and self-determination in human behavior. *Plenum*.

Deci, E. L., & Ryan, R. M. (2013). The Intrinsic motivation and self-determination in human behavior. *Springer Science & Business Media*.

Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From the game design elements to gamefulness: defining" gamification". In Proceedings of the 15th international academic MindTrek conference: *Envisioning future media environments* (pp. 9-15).

Dewey, J. (1916). Democracy and Education: An introduction to the philosophy of education. e Macmillan Company. *New York*.

Dewey, J. (1938). Experience and education: Kappa Delta Pi. *International Honor Society in Education*. Fullan, M. (2007). The new meaning of educational change. *Teachers College Press*.

Gee, J. P. (2003). What video games have to teach us about learning and literacy. *Computers in Entertainment (CIE)*, 1(1), 20-40.

Gonzalez, R. (2018). Enhancing Student Engagement Through Gamification: A Literature Review. *Journal of Information Systems Education*, 29(3), 168-178.

Hamari, J., Koivisto, J., & Sarsa, H. (2014). Does gamification work? A literature review of empirical studies on the gamification. In 2014 47th Hawaii International Conference on System Sciences (pp. 3025-3034). *IEEE*.

Hattie, J. (2009). The Visible learning: A synthesis of over 800 meta-analyses relating to achievement. *Routledge*.

Helm, J. H., Katz, L. G., & Wilson, R. (2023). Young investigators: The project approach in the early years. *Teachers College Press*.

Johnson, L. (2020). Gamification in the Classroom: Overcoming Challenges for Effective Implementation. *Journal of Educational Technology Systems*, 49(4), 529-547.

Kahdim, M., Rafiq, S., & Afzal, A. (2023). Aligning Curriculum with The Philosophy of Progressivism: Comprehensive Analysis. *Journal of Social Sciences Development*, 2(2), 152-162.

Kamran, F., Afzal, A., & Rafiq, S. (2022). Students' perception Regarding Teachers' teaching Practices at University Level. *Journal of Social Sciences Development*, 1(1), 13-26.

Kamran, F., Kanwal, A., Afzal, A., & Rafiq, S. (2023). Impact of interactive teaching methods on student learning outcome at university level. *Journal of Positive School Psychology*, 7(7), 89-105.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370-396. Piaget, J. (1950). The Psychology of Intelligence. London: *Routledge & Kegan Paul Ltd*.

Pivec, M., Dziabenko, O., & Schinnerl, A. (2003). Competence-based knowledge Space: an approach to computer-supported learning & assessment. *British Journal of Educational Technology*, 34(6), 653-665.

Rabillas, A., Kilag, K., Cañete, N., Trazona, M., Calope, L., & Kilag, J. (2023). Elementary Math Learning Through Piaget's Cognitive Development Stages. *Excellencia: International Multi-disciplinary Journal of Education*, 1(4), 128-142.

Rafiq, S., Afzal, A., & Kamran, F. (2022). Impact of School Environment on Students' Academic Achievements at the University Level. *VFAST Transactions on Education and Social Sciences*, 10(4), 19–30.

Rafiq, S., Kamran, F., & Afzal, A. (2023). Enhancing Professional Motivation in the Early Childhood Teacher Education: Unraveling Issues & Challenges. *Journal of Social Sciences Development*, 2(1), 26-43.

Rogers, E. M. (1962). Diffusion of innovations the free Press of Glencoe. NY, 32, 891-937. Ryan, R. M., & Deci, E. L. (2017). Self-determination theory: Basic psychological needs in motivation, development, and wellness. *Guilford publications*.

Sinde, J., & Alves, J. M. (2024). Scouts' Perspectives on Learning Experiences from a Pedagogical Innovation Scope. *Education Sciences*, 14(1), 87.

Smith, A. (2019). Gamification in Education: A Systematic Mapping Study. *International Journal of Computer Science and Information Security*, 17(6), 134-151.

Sterling, S. R., & Orr, D. (2001). Sustainable education: Re-visioning learning and change (Vol. 6). Totnes: Green Books for the Schumacher Society.

UNESCO, I. (2008, November). Inclusive education: The way of the future. In Conclusions and recommendations of the 48th session of the International Conference on Education (ICE), (págs. 25-28). *Geneva*.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. *Harvard University Press*.

Werbach, K., & Hunter, D. (2015). The Gamification Toolkit: The Dynamics, Mechanics, and Components for the Win. *Wharton Digital Press*.

Zhang, T. (2022). Exploration and Practice of Gamification in Kindergarten Curriculum. *The Educational Review, USA*, 6(10), 549-551.

Zourmpakis, A. I., Kalogiannakis, M., & Papadakis, S. (2023). Adaptive gamification in science education: An analysis of the impact of implementation and adapted game elements on students' motivation. *Computers*, 12(7), 143.