SCIENTIFIC CULTURE

www.sci-cult.com

SCIENTIFIC CULTURE, Vol. 11, No. 3.2, (2025), pp. 248-261
Open Access. Online & Print

DOI: 10.5281/zenodo.11322520

LEVERAGING DIGITAL INTERACTIVE GAMES TO ENHANCE MATHEMATICS LEARNING IN CHINESE PRIMARY SCHOOLS

Sichen Chen[1], Kien Tsong Chau[2*], Mariam Mohamad[3], Muhammad Suhaimi Mohd Yusof[4], Yi Chen[5]

[1]Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Penang, Malaysia. School of Art and Design, Jiangxi Institute of Fashion Technology, 330201 Nanchang, China.
chensichen@student.usm.my, https://orcid.org/0009-0001-3479-8925
[2]Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Penang, Malaysia.
chaukientsong@usm.my, https://orcid.org/0009-0009-2390-441X
[3]Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Penang, Malaysia.
mmohamad@usm.my, https://orcid.org/0000-0001-8498-4139
[4]Faculty of Business and Communications, INTI International University, Nilai, Negeri Sembilan, Malaysia.
muhdsuhaimi.yusof@newinti.edu.my, https://orcid.org/0000-0001-9129-7687
[5]Centre for Instructional Technology and Multimedia, Universiti Sains Malaysia, Penang, Malaysia; School of Art and Design, Jiangxi Institute of Fashion Technology, 330201 Nanchang, China.
chenyi@student.usm.my, https://orcid.org/0009-0000-4363-663X

Received: 08/08/2025
Accepted: 14/09/2025

Corresponding Author: Kien Tsong Chau (chaukientsong@usm.my)

ABSTRACT

This study aims to explore the learning experience of digital interactive games in mathematics among primary school students in China. It also seeks to uncover the impact of digital games on engagement, motivation, and learning outcomes in mathematics education. A qualitative approach was employed, involving semi-structured focus groups and observations of 10 primary school students and five mathematics teachers in China. Thematic analysis was conducted to identify patterns and themes in the data, with a focus on the benefits, challenges, and pedagogical implications of integrating digital interactive games into mathematics instruction. The findings reveal that digital interactive games enhanced students' experiences in engagement, motivation, and conceptual understanding in mathematics learning. Students and teachers also reported increased enthusiasm and enjoyment in problem-solving skills and mathematical proficiency. The challenges identified included resource constraints and pedagogical concerns. Overall, this research contributes to the body of knowledge on digital interactive games for primary school mathematics education in China and highlights the importance of integrating technology into mathematics education to enhance student learning experiences. It also provides insights for educators, curriculum developers, and policymakers seeking to leverage digital games as a pedagogical tool to improve mathematics education.

KEYWORDS: Digital Interactive Games, Mathematics Education, Primary School, Student Engagement.

1. INTRODUCTION

Mathematics education in Chinese primary schools affects students' cognitive development, problem-solving ability, academic performance, and career prospects (Heyd-Metzuyanim, 2019). Chinese education prioritizes early mathematics proficiency as a prerequisite for academic success. As a driver of technological and economic advancement (Li, 2022), mathematics is a compulsory subject in basic school. As a subject in STEM, the Mathematics examination is as important as examinations like the High School examination called "Gaokao", which determines students' eligibility for further education (Bhutoria & Aljabri, 2022). In Chinese primary schools, mathematics education is characterized by a broad standard curriculum and high-performance expectations (Trakulphadetkrai et al., 2019). China's innovation and global competitiveness goals are linked to the students' mathematics ability. In today's world, where technology advances rapidly, mathematics skills are essential for success in science, engineering, finance, and Information Technology (Dommett et al., 2022). As China transitions from manufacturing to knowledge, students' mastery of mathematics skills is inevitably needed in the 21st-century global economy (Brändle et al., 2023).

The emergence of digital interactive games as educational technology has transformed the way teaching is conducted worldwide (Qiu & Luo, 2022). Digital interactive games in education have risen owing to the widespread use of computers, tablets, and smartphones (Bui et al., 2023). Digital interactive games potentially boost mathematics and other subjects' motivation, engagement, and performance as these games provide immersive, dynamic, and fun learning environments that are personalized to each student's interests (Campbell & Atagana, 2022). Added with immediate feedback through storytelling, problem-solving, and interactivity in digital games (Catala et al., 2022), learning environments can be adjusted to students' learning styles and paces. In addition to game mechanics, progress bar, badges, free exploration, and leveling up in digital games, children and adolescents are trained to develop autonomy in a safe context (Lee et al., 2022; Hébert et al., 2022).

Recent years have seen an increase in the use of digital interactive games in elementary schools to teach arithmetic. Digital games' interaction engages students and enhances their mathematical skills (Moyer-Packenham et al., 2019). Instead of passive learning, digital games allow students to explore, discover, and solve problems. Murugiah et al. (2023) found that digital interactive games' difficulty, advancement, and mastery drive students to overcome academic hurdles (Dommett et al., 2022). Digital interactive games may also be customized to fit students' different abilities and interests. Mathematics games teach logic, spatial imagery, and numerical reasoning. Digital games provide immediate and relevant feedback, thereby enabling students to evaluate their progress, identify areas for improvement, and make informed schooling decisions (McLaren et al., 2022; Yıldırım, 2022).

2. RESEARCH OBJECTIVES

This study examines how digital interactive games could be used to improve mathematics learning in Chinese primary schools. Specifically, the study has three goals to achieve as follows:

1. Investigate how digital interactive games affect student engagement and motivation in arithmetic learning.
2. To study instructors' experiences in integrating digital interactive games into mathematics instruction.
3. Identify obstacles to implementing digital interactive games in primary school mathematics education.

3. SIGNIFICANCE OF THE STUDY

This study adds to the literature on digital interactive games in mathematics education, notably in Chinese elementary schools. This study examines how digital games improve student motivation, engagement, and mathematical learning. The research strived to analyze student and instructor perspectives and experiences. The study's conclusions are essential for educators, curriculum authors, and legislators who would like to improve mathematics learning. This study fills the gap in the literature where digital interactive games in mathematics education are ignored in China. Digital interactive games are gaining popularity in Western countries, but their use and efficacy in Chinese primary schools are unknown. Thus, the findings of this study will provide vital insights into China's unique cultural, educational, and technical setting. The study's findings can also help educators and policymakers to be aware of the use of digital interactive games to solve traditional mathematics problems in primary schools.

4. LITERATURE REVIEW

Digital interactive games contain game elements such as challenges, prizes, and instant feedback. These game elements potentially construct adaptive learning environments for students to foster interest

in exploring arithmetic dynamically and meaningfully at their own study pace (Sun et al., 2021; Heyd-Metzuyanim, 2019). Despite their potential, digital interactive games in primary school mathematics education require careful design consideration. Concerns exist about whether digital interactive games are compliant with curricular requirements and learning objectives (Nikolopoulou et al., 2019). Hébert et al., (2022) stressed the significance of accessibility and fairness in learning through digital interactive games to ensure that all students gain benefits. To successfully optimize its benefits, educators must actively participate in continual professional development using digital interactive games learning.

4.1. Overview of Digital Interactive Games in Education

Digital interactive games combine simulations, gameplay challenges, and feedback methods to engage players in gaming. Educational games, on the other hand, are designed to teach concepts or skills through interactive gaming (Nicholas et al., 2022). Educational games are designed for more than just fun. They usually involve educational elements such as training, problem-solving, and practice. Users can manipulate virtual worlds in games to learn and build skills. Gamification, on the other hand, uses leaderboards, points, and badges to inspire and engage students in non-game contexts (Salaberri et al., 2021). Mathematics, physics, language arts, and social studies are among the subjects commonly covered by digital interactive games. Digital games are available on PC programs, smartphone apps, web-based games, and virtual reality experiences. Interactive digital games create dynamic and engaging learning environments that improve knowledge and skill acquisition (Fernandes et al., 2023). It allows active hands-on interaction that helps to enhance conceptual memory. An immediate feedback loop in digital interactive games will also enable learners to assess their progress. By giving them the chance to alter their strategies, self-regulated learning can be promoted (Malaquias & Malaquias, 2021). Visual learners may benefit from amazing images and animations in the digital interactive games, while auditory learners benefit from audio signals and narration in the games. Games also often require speech, touch, and gesture to operate. This activates multimodal learning. Digital interactive games also encourage student collaboration and socialization (Gu et al., 2022). Students from different backgrounds could join online communities in multiplayer games, thereby facilitating teamwork, communication, and cooperation in today's interconnected global environment.

4.2. Benefits and Challenges of Integrating Games in Primary Mathematics Education

Digital interactive games potentially promote elementary mathematics learning in many ways. Firstly, digital interactive games are captivating. Unlike traditional instructional methods, they struggle to keep students engaged. For example, a simulation that reflects a realistic world using colorful images and animation attracts the attention of youngsters (Harisanty et al., 2020). Games. In another example, the games are also capable of making abstract mathematical concepts tangible and entertaining (Canet-Juric et al., 2021). Regular practice and immersion in the tangible environment assist students learn concepts applicable to real-world problems (Broemmel et al., 2021). Instant feedback allows players to assess their progress, spot their flaws, and gradually adapt their learning strategies (Trakulphadetkrai et al., 2019). Iterative feedback promotes metacognition and self-regulated learning.

There are multiple challenges in applying digital interactive games in mathematics education. Amongst others, resource shortages are the central issue. Some schools and universities struggle to integrate digital games into their curriculum due to a lack of internet, computers, or tablets (Birkeland & Grindheim, 2021). For learning institutions with limited funds, concerns include expensive hardware maintenance, system upgrades, and software licensing. The lack of game-based learning may exacerbate educational inequality, which disproportionately affects poor students.

Gaining professional training in the use of digital interactive games is another thorny issue that needs to be addressed. Inexperienced instructors may struggle to incorporate digital interactive games into their classes (Benavides-Varela et al., 2023). Insufficient knowledge of system compatibility, technological infrastructure, and other technical issues may hinder the use of digital interactive games in the classroom. (Fondo & Gómez-Rey, 2021).

4.3. Previous Studies on Using Digital Interactive Games for Mathematics Learning

Ginsburg et al., (2019) found that mathematics exercises in digital interactive games improved students' focus and persistence. According to a meta-analysis by Vanbecelaere et al. (2020), digital interactive games promote academic performance,

peer collaboration, communication, interpersonal skills, and social participation in mathematics education. (Bouncken et al., 2023; Laakso et al., 2021). Individualized learning is also materialized in digital interactive games (Uskoković, 2023).

5. METHODOLOGY

5.1. Research Design

This study employed a qualitative research design to explore the use of digital interactive games for mathematics learning in primary school settings. Qualitative methods were chosen to gain in-depth understanding of participants' experiences, perceptions, and attitudes towards game-based learning (Weinhandl et al., 2024). Qualitative research enables researchers to capture rich and detailed insights that may not be adequately captured through quantitative approaches (Korhonen et al., 2019) by employing qualitative analysis techniques, such as thematic analysis. The study potentially uncovers nuanced understandings of the phenomenon. The qualitative approach was chosen for three reasons. Firstly, it allows open exploration of participants' perspectives, thereby enabling researchers to delve into specific topics that potentially expose unexpected insights (Boardman & McCormick, 2023). Secondly, it provides the flexibility to capture the diverse range of experiences and perspectives associated with game-based learning in primary mathematics education. Thirdly, qualitative research is well-suited for examining subjective phenomena in settings, such as attitudes, beliefs, and perceptions, which are the central key concepts adopted in this study to understand the use of digital games in educational contexts (Korhonen et al., 2019).

5.2. Participants

The participants in this study consisted of 10 primary school students and five mathematics teachers from China. The inclusion criteria for student participants were that they were enrolled in primary school and had prior experience with digital interactive games for mathematics learning. Students from diverse grade levels, ranging from Grades 1 to 6, were considered to capture a broad spectrum of perspectives. The inclusion criteria for teachers were that they were teaching mathematics at the primary school and had prior experience or interest in using digital interactive games as instructional tools. Participants were excluded if they did not meet the aforesaid inclusion criteria (Table 1). A sample size of 15 individuals (10 students and five teachers) was deemed sufficient for this qualitative research. Qualitative research seeks in-depth knowledge, rather than statistical generalizability, and small information-rich samples are frequently enough (Patton, 2015). The sample size was regulated by the saturation principle, which is a point where further interviews do not add new themes or ideas (Guest, Bunce, & Johnson, 2006). As seen in other research, saturation is typically achieved when using 12–20 interviews in studies where participants have a standard setting or experience (Creswell & Poth, 2018). Consequently, our sample was large enough to accommodate diverse views from teachers and students while allowing the data depth and handlability needed for robust thematic analysis.

Table 1: Inclusion and Exclusion Criteria.

Criteria	Inclusion	Exclusion
Primary	Enrolled in primary school	Not enrolled in primary school
School Students	Experience with digital interactive games for mathematics learning	Lack of experience with digital interactive games for mathematics learning
	Age between 8 and 12 years old	Age outside the specified range of 8-12 years old
Mathematics Teachers	Currently teaching mathematics at the primary school	Not currently teaching mathematics at the primary school level
	Experience or interest in using digital interactive games as instructional tools	Lack of experience or interest in using digital interactive games as instructional tools
	Willingness to participate in the study and provide informed consent	Unwillingness to participate in the study or provide informed consent

A combination of purposive and snowball sampling strategies was employed to select the participants who met the aforementioned specific criteria. To ensure diversity and representativeness within the sample, primary schools from different geographic locations within China were approached for participation. School administrators and mathematics department heads were contacted to explain the purpose of the study. Permission was sought to recruit the qualified participants from their schools. Once permission using Informed consent forms was obtained, potential participants were identified based on recommendations from the school staff and teachers. Fifteen participants were identified and selected. (Table 2). Subsequently, these participants were provided with detailed information about the study purpose and procedures. Meanwhile, confidentiality assurances

were given to them. To ensure voluntary participation, informed consent was then obtained from both the students and their parents or guardians before they participated in the study. Similarly, mathematics teachers who met the inclusion criteria were identified through recommendations from school administrators and colleagues. Teachers who expressed interest in participating were contacted directly and invited to take part in the study. Informed consent was obtained from all teacher participants before their involvement in the research. For anonymity, all participants were assigned unique codes. Student participants are labeled as "S" followed by a number (e.g., S001, S002), and teacher participants are labeled as "T" followed by a number (e.g., T001, T002). These codes are used throughout the Findings section to present quotations and insights while maintaining confidentiality.

Table 2: Profile of Respondents.

Participant ID	Age	Grade	Role	Experience with Digital Games
S001	10	4	Student	Moderate
S002	9	3	Student	High
S003	11	5	Student	Low
S004	8	2	Student	High
S005	12	6	Student	Moderate
T001	-	-	Teacher	Extensive
T002	-	-	Teacher	Moderate
T003	-	-	Teacher	High
T004	-	-	Teacher	Low
T005	-	-	Teacher	High
S006	10	4	Student	Moderate
S007	9	3	Student	High
S008	11	5	Student	Low
S009	8	2	Student	High
S010	12	6	Student	Moderate

5.3. Data Collection

Table 3: Interview Guidelines.

Variable	Interview Questions
Student Experience	1. What do you enjoy most about learning mathematics through digital games?
	2. Can you describe a memorable experience or lesson involving digital mathematics games?
	3. How do you think digital games help you to understand mathematics concepts better?
	4. Do you find digital games motivating you to learn mathematics?
Teacher Perspectives	1. What benefits do you see in integrating digital games into mathematics education?
	2. What challenges have you encountered when using digital games for teaching mathematics?
	3. How do you assess the effectiveness of digital games in supporting mathematics learning?
	4. What strategies do you use to incorporate digital games into your mathematics lessons?
Learning Outcomes	1. In your opinion, how do digital games impact students' mathematics skills and knowledge?
	2. Can you provide examples of improvements or challenges you have observed in students' mathematics learning with games?
	3. How do digital games influence students' attitudes towards mathematics?
	4. Have you noticed any differences in engagement levels between digital game-based lessons and traditional methods?
Technology Integration	1. What technological resources are available and accessible for using digital games in mathematics education?
	2. How do you ensure equitable access to technology for all students in your classroom?
	3. What support or training do teachers receive for integrating technology into mathematics teaching?
	4. Are there any technical barriers or limitations you face when using digital games for mathematics instruction?
Pedagogical Approaches	1. How do you design digital game-based activities to align with mathematics curriculum objectives?
	2. What considerations do you take into account when selecting or creating digital games for mathematics learning?
	3. How do you balance game-based learning with traditional teaching methods in your mathematics lessons?
	4. What feedback or assessments do you use to evaluate students' progress in mathematics learning through digital games?

Data for this study were collected using semi-structured interviews. Semi-structured interviews were chosen because of their flexibility in exploring participants' experiences, perceptions, and attitudes towards game-based learning in mathematics (Weinhandl et al., 2024). The interview protocol was developed based on the research objectives. In-depth open-ended questions and relevant prompts were used to elicit rich and detailed responses from the participants (Table 3). Interviews were conducted in Chinese, the participants' native language, to facilitate clear communication and comprehension. Each interview session was conducted individually and lasted for 30 to 45 minutes. This allowed for in-depth exploration of the research topics. Interviews were conducted in a private and comfortable setting within the school premises, such as classrooms or meeting rooms, to ensure confidentiality and

minimal distractions. The interview process was guided by the interview protocol, which covered topics such as participants' experiences with digital interactive games, perceived benefits, challenges, preferences, and suggestions for improvement in game-based learning in mathematics. During the interviews, participants were encouraged to share their thoughts and feelings openly. All interviews were audio-recorded with the participants' consent to ensure accuracy and completeness of the data. After completing the interviews, the audio recordings were transcribed verbatim in Chinese. Transcripts were then translated into English by bilingual researchers to facilitate analysis and interpretation. The translated transcripts were reviewed for accuracy and consistency before being entered into a qualitative data analysis software program for coding and thematic analysis.

5.4. Data Analysis

To gain valuable insights from interview data, a methodical approach in qualitative analysis was used. In the first level of analysis, open coding, which required meticulous transcript analysis to identify key concepts, themes, and patterns, was utilised. Each data group was given descriptive names or IDs to represent its essence. In the second level of analysis, axial coding was used to investigate the associations between motives and displayed codes. Coded extracts were thoroughly assessed and categorized. Categorizing encoding based on conceptual linkages and similarities was performed intensively. By identifying and refining data's interrelated codes, axial coding helped to identify main themes. A careful iterative classification of interview transcript data into subthemes and themes potentially reveals crucial trends and insights. Therefore, the researchers conducted periodic evaluations and refinements to ensure that the prominent themes they focused on were thorough and trustworthy. The research questions that initiated the investigation were then contrasted with the findings. The researchers evaluated whether the emerging themes answered the research questions and solved the research issues. Peer and member review strengthened the findings.

5.5. Ethical Consideration

Participants' rights, safety, and anonymity, as well as ethics, were essential throughout the study. As such, all research participants, both primary school students and mathematics teachers, would be given informed consent. Participants were told the study's goal, methods, risks, and benefits. They were also told that they could leave the research at any moment without penalty. All personally identifiable information was anonymized for privacy.

6. FINDINGS

We found a rich tapestry of experiences, ideas, and methods in using digital games for mathematics education by interviewing students and teachers. The relevant challenges, opportunities, pedagogical approaches, student experience, teacher views, learning results, and technology integration became clear after the analysis. Digital interactive games seem to have enhanced student motivation, engagement, and academic achievement. To a large extent, digital interactive games may foster a culture of discovery and inquiry in mathematics education in 21st-century digital life.

6.1. Theme 1: Student Experience

Engagement, enjoyment, learning outcomes, and comprehension guided interviews and observations conducted in the study. Interview outcomes reveal that students were most enthusiastic about learning mathematics through digital games. "I derive satisfaction from engaging in mathematics games as they enhance the enjoyment of learning," said S001. Several participants believed that digital games' interactive and dynamic features made arithmetic learning more fun. Students also listed various reasons they liked utilizing digital games to learn arithmetic. Among other reasons, the games are free and flexible, allowing students to learn at their own pace and explore different disciplines in a secure environment. The student with ID S003 said, "I value the opportunity to investigate different ideas and acquire knowledge at my own pace in a secure setting". Interview outcomes also show that competitive components in many digital games motivate students to push their limits. A student with ID S004 contended, "I enjoy participating in competitive activities with my classmates and working hard to exceed my previous best scores." "It motivates me to persist in enhancing and perfecting my mathematical abilities". This intrinsic motivation established by digital game-based learning can have a lasting impact on students' mathematics engagement and devotion. Student responses also show that visible objects in digital games help students learn complex mathematical concepts. S005 student said, "I find that participating in mathematical games enhances my understanding and ability to represent abstract ideas" (S005) mentally. Gaming provided instant feedback, helping students identify and correct problems, and

improving academic performance. S006 stated, "When I commit errors in the game, it instructs me on my missteps and provides guidance on how to rectify them." Apparently, this helped them to learn from their blunders, according to the S006 student. Personalized feedback systems in digital games can help students learn mathematics by meeting their needs. After playing digital interactive games, students gain a deeper understanding of their mathematics. Reinforcement and repetition helped students to learn arithmetic concepts through active participation. A person's mathematics skills have improved significantly since playing mathematics games regularly. S007 stressed that "I possess superior computational speed and a heightened level of self-assurance when it comes to problem-solving". Gamification also increased student enthusiasm and desire for new challenges, which helped them to improve their mathematics abilities. This study supports previous evidence suggesting digital games improve mathematics students' interest, participation, and performance (Dondio et al., 2023). Figure 1 shows the weightage analysis of theme 1.

Figure 1: Weightage Analysis of Theme 1.

6.2. Theme 2: Teacher Perspectives

The teachers' comments focused on the benefits and challenges of digital games in mathematics teaching (Figure 2). Research has shown that incorporating digital game activities into mathematics instruction benefits the teachers. Digital games, according to the interviewed teacher, have increased student engagement in numeracy instruction. Other participants noted that the immersive atmosphere in digital games engages and encourages active participation from teachers in educational activities. Instructors also stated that digital games improve student performance in arithmetic skills. A teacher with ID T002 said that digital games have improved their students' mathematics skills. They seem to learn faster and score better on examinations (T002). This aligns with one research study that found digital games improved students' arithmetic learning, conducted by Benavides-Varela et al. (2023). Regarding challenges that the teachers face, technological barriers to digital games in teaching were the major obstacle. The teachers noted that technical resource constraints, poor internet connectivity, and classroom equipment interoperability are other difficulties the teachers encountered. T003 teacher said, "The absence of technological infrastructure at my school is a significant hurdle that I encounter,". The teacher continued, "Many of my students do not have electronic devices, and those that do often have tech issues." For teachers, integrating digital games into mathematics instruction was challenging due to technological issues and restrictions on students' access to the games.

Regarding digital game pedagogy for mathematics instruction, it was found that the students' top concerns were curricular alignment and the capability to allow seamless integration of digital game-based learning and traditional teaching methods. Meeting students' diverse learning needs was another challenge for the teachers. Teachers are found to have used formative evaluation, differentiation, and scaffolding to address these challenges. As per the T004, the teacher said, "I design educational activities using digital games that are in line with the curriculum goals and integrate them into my lesson plans." I also guide students who struggle with the material (T004). This method allowed teachers to include digital games in mathematics classes while meeting students' different needs. The study illuminated the pros and cons of using digital interactive games in mathematics instruction. Digital games may improve student engagement, involvement, and learning outcomes, but technological and pedagogical barriers limit their use. More research is needed to solve these issues. Figure 2 shows the weightage analysis of theme 2.

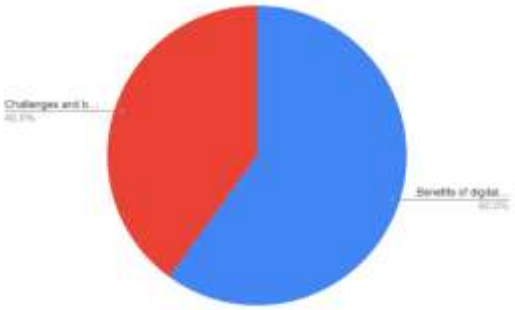

Figure 2: Analysis of Theme 2.

6.3. Theme 3: Learning Outcomes

Teacher and student interviews indicated that digital interactive games helped students comprehend mathematics well. Digital games were said to have improved their problem-solving skills. A student with S001 said, "Mathematics games have helped my problem-solving. I solve problems faster and think critically about strategies". Teachers noted students' improved ability to relate arithmetic to real-world situations. "My problem-solving abilities have improved since I started playing mathematics games frequently," said S002. "I am more comfortable with difficult arithmetic". Digital games also helped students improve their critical thinking skills. T001 students stated that digital games helped them strategize, understand trends, and assess different options. Another noteworthy study showed that digital interactive games affect students' arithmetic attitudes, interest, enthusiasm, and confidence. According to S003, "Mathematics games have made me like it. I now like mathematics class and feel more secure" (S003). Student attitudes about arithmetic changed because digital games were engaging, making mathematics more fun and accessible. S004 said, "Mathematics games showed me that mathematics is enjoyable and engaging. I used to find mathematics uninteresting, but now I like challenging myself." Overall, digital games motivated students to practice arithmetic and develop perseverance. Figure 3 shows the weightage analysis of theme 3.

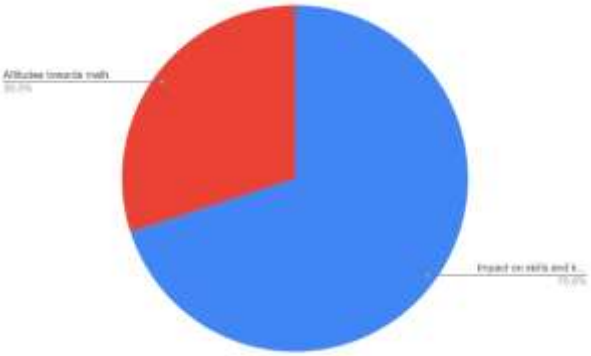

Figure 3: Analysis of Theme 3.

6.4. Theme 4: Technology Integration

In general, technology resources such as digital tools and gadgets should allow equitable access by all students. Student S001 added, "Every student should have the opportunity to utilize technology as it enhances learning in multiple ways". Participants also noticed significant access disparities, since some students lacked electronic devices or reliable internet connectivity." Incorporating technology into my lessons is challenging due to the lack of access to devices or internet at home for some of my students," remarked a teacher, T001. Teachers stated they needed more training and help with technology and teaching. "I would gain an advantage from receiving supplementary instruction on the optimal methods for incorporating technology into my mathematics lessons," remarked a tutor. While there may be a shift, my goal is to employ technology to increase student learning (T002). Participants also underlined the necessity of professional growth and collaboration to share technology-based mathematics teaching methods. This study demonstrates that academic institutions must provide thorough technological training and assistance to professors. Several strategies to integrate technology into mathematics training and problems were discussed. Teachers and students support each other by utilizing digital tools and devices to engage mathematics students. Interactive whiteboards, iPads, and instructional software were proposed for creating engaging learning environments that cater to varied learning types. One mathematics instructor says interactive whiteboards and apps interest students. The personalized approach was appreciated by a student who said, "I value how technology facilitates my intellectual growth and allows me to explore a wide range of ideas in a safe environment" (S002). Using adaptive learning systems, online seminars, and interactive simulations, instructors may tailor learning for each student. Video conferencing, online forums, and collaborative papers allow students to collaborate, exchange ideas, and interact with peers and professionals globally. Figure 4 shows the weightage analysis of theme 4.

Figure 4: Analysis of Theme 4.

6.5. Theme 5: Pedagogical Approaches

The conversations with students and teachers illuminate how digital interactive games are employed in mathematics instruction. These tips show how to create game-based activities and integrate game-based learning into traditional

teaching. A prominent sub-theme was game-based learning that used play to accomplish curricular goals. Speakers stressed the need to combine game-based activities with the curriculum to help children learn. "The alignment between mathematics games and our classroom curriculum is essential for us to practice and strengthen our skills effectively," stated a student. Panelists suggested utilizing points, levels, and prizes to inspire students. A tutor noted, "I have found that incorporating game mechanics, such as points and rewards, into my mathematics lessons helps to sustain students' interest and motivation" (T001). These findings demonstrate that students need practical game-based activities that support educational goals. This required introducing digital games to teaching methods and tailoring them to different learners. Participants stressed the need to mix digital gaming with conventional teaching techniques to provide students with a well-rounded education. A student commented, "I value the way my teacher combines game-based learning with traditional teaching methods." "I can improve my comprehension of the subjects" (S002). Participants highlighted the importance of tailoring teaching methods to student needs. One instructor pledged to adapt to students' learning styles. Games vary in difficulty to match the learner's ability. Game complexity may differ in my assignments (T002). This suggests that game-based learning and traditional teaching approaches should be combined to create inclusive and effective learning environments that match students' requirements. Game-based mathematics education design and implementation were addressed. Participants recommended implementing digital games into educational and curricular aims. Participants stressed the necessity of choosing games that complement learning goals. These assured students enjoyed games. "I carefully select digital games that match our curriculum objectives and learning goals." "This guarantees that activities centered around games are efficient and relevant in promoting student learning" (T003). Participants also stressed the need for scaffolding and support for game-based learning. A student commented, "I value the way my teacher offers support and guidance while we participate in mathematical activities." Participation excites and empowers me (S003). This research suggests correctly planning and implementing game-based activities to optimize student learning. Figure 5 shows the weightage analysis of theme 5.

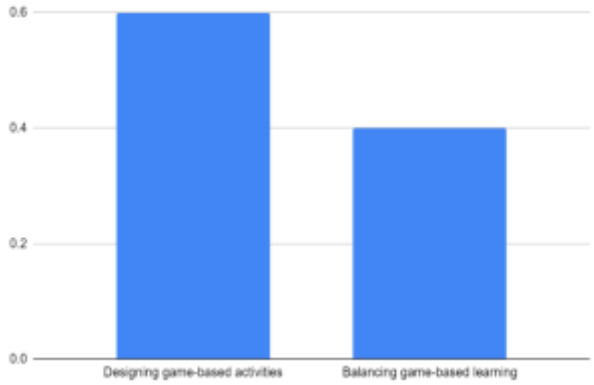

Figure 5: Weightage Analysis of Theme 5.

7. DISCUSSION

This study analyzes the students' and teachers' experiences of using digital interactive games in mathematics learning. This was done by interviewing teachers and students. This study also attempts to examine the teachers and students' motivation and engagement in their mathematics learning. The study suggests that digital games may inspire and boost student engagement in mathematics learning (Yıldırım, 2022). Digital interactive games deliver an immersive and interactive learning environment that deepens their mathematics engagement (Christodoulakis et al., 2021). Interviews with students and instructors found that digital games motivated and engaged students. Students showed genuine interest in playing digital games to study arithmetic, underscoring its appeal. Digital games increased student engagement and curiosity in mathematics classes, according to educators. This study also shows that digital interactive games increase arithmetic proficiency. This supports recent research showing that learning through games improves cognition. Digital games improved students' mathematics comprehension and problem-solving, according to interviews. Mathematics games helped students feel confident and competent when solving complex mathematics problems. Teachers reported significant improvements in students' problem-solving skills.

In contrast, Theme 2 of our investigation, which focused on educators' views, identified various challenges and concerns related to digital games in mathematics instruction. The findings match (Sun et al., 2021). The study highlights how digital games may boost student engagement and performance. Resource limits, technology integration issues, and pedagogical issues are also highlighted. Digital games in the classroom sparked concerns among

educators due to technical problems, limited resources, and restricted technology access. These findings corroborate prior research on preparation and educational objectives (Benavides-Varela et al., 2023). Despite these difficulties, teachers wanted to use digital games to improve students' mathematics skills. Teachers emphasized the importance of helping students overcome hurdles and incorporating digital games into classrooms. They stressed the need to include game-based activities in educational goals and adapt teaching methods to student needs. Mathematics teachers can maximize the benefits of digital interactive games by overcoming these obstacles and employing effective pedagogy.

Theme 3 studies how digital interactive games impact students' arithmetic skills, knowledge, and attitudes. A recent study shows that digital games improve students' mathematical reasoning, critical thinking, and problem-solving (Fondo & Gómez-Rey, 2021). Players felt more competent solving complex arithmetic issues after playing games. Digital games in mathematics teaching improved students' problem-solving skills, according to teachers. This study also shows how digital interactive games alter students' mathematics preferences. Digital games have made youngsters love mathematics, according to interviews. Students' confidence and passion for mathematics were revived by digital games' interactive and participatory elements. Digital games changed students' mathematics attitudes, according to teachers.

Theme 4 found various issues with digital games in mathematics instruction. Academic research says technology improves student performance and engagement. Mathematics teachers may maximize the benefits of digital interactive games by addressing these obstacles and employing good pedagogy (Liu & Wu, 2022). Despite these limits, instructors sought to utilize technology to enhance students' mathematics skills. Teachers said they needed full assistance and guidance to overcome obstacles and integrate technology into their lessons. They also advocated connecting technology with educational goals and tailoring teaching methods to student needs.

Self-determination theory proposes that intrinsic motivation, autonomy, competence, and relatedness promote student learning and engagement (Iyamuremye et al., 2023). Students learn independence and competency through interactive and engaging digital games. This helps students overcome obstacles and solve issues, improving their skills. The study's favorable findings support constructivist learning theories of active engagement, social connection, and comprehension (Liu et al., 2023). Through inquiry and trial-and-error, digital games teach students. The findings underscore the need for educators to receive sufficient support and training to integrate digital games into their teaching effectively. Professional development helps teachers find, customize, and employ curriculum-aligned digital games. Equal and consistent access to electronic resources for all students helps alleviate economic constraints and the digital divide. Governments and schools may invest in infrastructure and initiatives to provide students with both classroom and mobile internet access. Teachers can supplement conventional methods with digital games to give students new learning options. Teachers may also employ multiplayer activities to foster social learning and collaboration. This study suggests that digital interactive games may alleviate traditional mathematics instruction concerns, including low student motivation and participation. Digital games can create a love of mathematics in students. Digital games encourage resilience by letting students experiment, explore, and conquer challenges in a safe and loving environment.

Although digitalization efforts around the world have progressed quickly, the continued presence of problems like device shortages and access to poor internet connectivity emphasizes structural access inequalities to technology. Within Chinese primary school contexts, such problems are not technical hindrances but are based on deeper socio-economic and infrastructural divides between urban and rural areas. Even as government efforts have tried to extend digital infrastructure, unequal implementation and funding distribution have resulted in some schools, especially in poorer neighborhoods, lacking the resources. This is indicative of (Iyamuremye et al., 2023) considers the "second-level digital divide," where access exists in theory but inequalities in quality, consistency, and educational integration persist. Additionally, schools with lower budgets tend to allocate more funds to core instructional materials rather than digital resources, which promotes the persistence of such disparities in a world that is otherwise advancing. Such evidence implies that substantial digitalization in education not only needs technological provision but also systemic support, funding, and policies addressing equity in various learning environments.

7.1. Implications

The study's findings support constructivist

learning theories of active engagement and social connection. This study assists policymakers, curriculum authors, and teachers to incorporate digital interactive games into primary school mathematics curricula. The findings underscore the need for educators to receive adequate support and training to utilize digital interactive games in teaching effectively. Professional development is required to help teachers customize the curriculum-aligned digital games. This study enables educators and curriculum developers to create engaging and practical game-based activities that align with instructional and curricular objectives. Digital interactive games in mathematics courses may be dynamic and inclusive, meeting students' needs and interests. Teachers can supplement conventional methods with digital games to give students new learning options. Teachers may also employ multiplayer activities to foster social learning and collaboration. This study suggests that digital interactive games may alleviate traditional mathematics instruction concerns, including low student motivation and participation. Digital games can create a love of mathematics in students. Digital games encourage resilience by letting youngsters experiment, explore, and conquer challenges in a safe and loving environment.

7.2. Limitations and Future Direction

Although this research yields valuable information about the incorporation of digital interactive games into Chinese primary school mathematics instruction, various limitations must be recognized. First, the relatively small participant sample of 15, comprising students and teachers from a few schools, could not possibly represent the full range of experiences in every Chinese primary school. Thus, the results cannot be generalized across other areas with varying socio-economic or technological environments. Second, the spatial scope of the study was small; participants were drawn predominantly from schools with uneven but not representative levels of technological infrastructure. That is, the findings cannot represent the experiences of schools located in peripheral or under-resourced areas where access to digital resources is much more limited. Third, the sole dependence on interview data poses possible biases like recall bias and social desirability since participants might have given answers that they thought were anticipated. Fourth, the cross-sectional study design captures participants' experience at one moment in time and restricts the opportunity to gauge the long-term influence of digital game-based learning on mathematics attainment and attitudes. Lastly, this research only explored the views of the students and the teachers; the lack of comments from the parents, the administrators, or the policymakers limits a broader appreciation for the challenges and possibilities of using digital interactive games in elementary education.

8. CONCLUSION

The findings revealed the impact of digital games on student motivation, engagement, learning outcomes, and pedagogy, highlighting several key issues. Digital interactive games engage mathematics students. These findings support previous research on game-based learning's cognitive and emotional advantages in arithmetic instruction. Mathematics education using digital tools faces various challenges, including resource restrictions, technology integration, pedagogical challenges, problems in aligning to the curriculum, lack of training, and limited technological access.

Acknowledgements: The authors would like to express their sincere gratitude to the Universiti Sains Malaysia, and all the academic and administrative staff involved for their technical assistance throughout the research project.

REFERENCES

Benavides-Varela, S., Laurillard, D., Piperno, G., Fava Minor, D., Lucangeli, D., & Butterworth, B. (2023). Chapter 2 - Digital games for learning basic arithmetic at home. In F. H. B. T.-P. in B. R. Santos (Ed.), Game-Based Learning in Education and Health - Part A (Vol. 276, pp. 35–61). Elsevier. https://doi.org/10.1016/bs.pbr.2023.02.001

Bhutoria, A., & Aljabri, N. (2022). Patterns of cognitive returns to Information and Communication Technology (ICT) use of 15-year-olds: Global evidence from a Hierarchical Linear Modeling approach using PISA 2018. Computers & Education, 181, 1–17. https://doi.org/10.1016/j.compedu.2022.104447

Birkeland, Å., & Grindheim, L. T. (2021). Exploring military artefacts in early childhood education: Conflicting perspectives on cultural sustainability, belonging and protection. Sustainability (Switzerland), 13(5), 1–12. https://doi.org/10.3390/su13052587

Boardman, R., & McCormick, H. (2023). Exploring how different ages of consumers shop on women's fashion retail websites. International Journal of Human-Computer Studies, 177, 1–14. https://doi.org/https://doi.org/10.1016/j.ijhcs.2023.103064

Bouncken, R. B., Aslam, M. M., Gantert, T. M., & Kallmuenzer, A. (2023). New work design for knowledge creation and sustainability: An empirical study of coworking spaces. Journal of Business Research, 154, 1–9. https://doi.org/10.1016/j.jbusres.2022.113337

Brändle, M., Sotiriadou, C., & Zinn, B. (2023). Self-assessments, attitudes, and motivational orientations towards the use of digital media in teaching a comparison between student teachers of different subject clusters. Heliyon, 9(9), 1–12. https://doi.org/10.1016/j.heliyon.2023.e19516

Broemmel, A. D., Rearden, K. T., & Buckner, C. (2021). Teachers' Choices: Are they the Right Books for Science Instruction? Reading Teacher, 75(1), 7–16. https://doi.org/10.1002/trtr.1998

Bui, P., Pongsakdi, N., McMullen, J., Lehtinen, E., & Hannula-Sormunen, M. M. (2023). A systematic review of mindset interventions in mathematics classrooms: What works and what does not? Educational Research Review, 40, 1–31. https://doi.org/10.1016/j.edurev.2023.100554

Campbell, O. O., & Atagana, H. I. (2022). Impact of a Scratch programming intervention on student engagement in a Nigerian polytechnic first-year class: verdict from the observers. Heliyon, 8(3), 1–11. https://doi.org/10.1016/j.heliyon.2022.e09191

Canet-Juric, L., Del Valle, M. V., Gelpi-Trudo, R., García-Coni, A., Zamora, E. V., Introzzi, I., & Andrés, M. L. (2021). Development and validation of the executive function questionnaire (Cufe) for children aged 9-12 years. Avances en Psicologia Latinoamericana, 39(1). https://doi.org/10.12804/revistas.urosario.edu.co/apl/a.9892

Catala, A., Gijlers, H., & Visser, I. (2022). Guidance in storytelling tables supports emotional development in kindergartners. Multimedia Tools and Applications, 82, 12907–12937. https://doi.org/10.1007/s11042-022-14049-7

Christodoulakis, N., Carulla, C. V., & Adbo, K. (2021). Perezhivanie and its application within early childhood science education research. Education Sciences, 11(12), 1–11. https://doi.org/10.3390/educsci11120813

Dommett, E., Limniou, M., Sedghi, N., Kumari, D., & Drousiotis, E. (2022). Student Engagement, Learning Environments and the COVID-19 Pandemic: A Comparison between Psychology and Engineering Undergraduate Students in the UK. Education Sciences 2022, 12(10), 1–19. https://doi.org/10.3390/EDUCSCI12100671

Dondio, P., Gusev, V., & Rocha, M. (2023). Do games reduce maths anxiety? A meta-analysis. Computers & Education, 194, 1–19. https://doi.org/10.1016/j.compedu.2022.104650

Fernandes, R., Sylla, C., Martins, N., & Gil, M. (2023). How Design and Technology Can Contribute to Learning: The Mobeybou in Brazil Educational Game Case Study. Springer Series in Design and Innovation, 24, 195–210. https://doi.org/10.1007/978-3-031-06809-6_13

Fondo, M., & Gómez-Rey, P. (2021). Integrating game-based learning for intercultural skills development in higher education. In F. P. (Ed.), 15th European Conference on Game Based Learning, ECGBL 2021 (Vols. 2021-Septe, pp. 213–221). Dechema e.V. https://doi.org/10.34190/GBL.21.084

Galanti, R., de Leoni, M., Monaro, M., Navarin, N., Marazzi, A., Di Stasi, B., & Maldera, S. (2023). An explainable decision support system for predictive process analytics. Engineering Applications of Artificial Intelligence, 120, 1–26. https://doi.org/10.1016/j.engappai.2023.105904

Ginsburg, H. P., Uscianowski, C., Carrazza, C., & Levine, S. C. (2019). Print and digital picture books in the service of young children's mathematics learning. In Handbook of Research on the Education of Young Children (pp. 85–98). Taylor and Francis. https://doi.org/10.4324/9780429442827-6

González-López, M., Machin-Mastromatteo, J., & Tarango, J. (2020). Diagnostic evaluation of thinking and information skills through the design and application of three instruments for children at first grade of elementary school. Revista Electronica Educare, 24(3). https://doi.org/10.15359/REE.24-3.21

Gu, C., Chen, J., Lin, J., Lin, S., Wu, W., Jiang, Q., Yang, C., & Wei, W. (2022). The impact of eye-tracking games as a training case on students' learning interest and continuous learning intention in game design courses: Taking Flappy Bird as an example. Learning and Motivation, 78, 101808. https://doi.org/10.1016/j.lmot.2022.101808

Harisanty, D., Srirahayu, D., Kusumaningtiyas, T., Anugrah, E., & Permata, I. (2020). The Utilization of Flashcards in Children Information Literacy Development. Library Philosophy and Practice, 2020, 1–12.

Hébert, C., Thumlert, K., & Jenson, J. (2022). Digital parents: Intergenerational learning through a digital literacy workshop. Journal of Research on Technology in Education, 54(1), 34–91. https://doi.org/10.1080/15391523.2020.1809034

Heyd-Metzuyanim, E. (2019). Changing teaching practices towards explorative mathematics instruction – The interweaving of teacher identity and pedagogical discourse. Teaching and Teacher Education, 86, 1–12. https://doi.org/10.1016/j.tate.2019.06.016

Hoel, T., & Tønnessen, E. S. (2019). Organizing Shared Digital Reading in Groups: Optimizing the Affordances of Text and Medium. AERA Open, 5(4), 1–14. https://doi.org/10.1177/2332858419883822

Iyamuremye, E., Ndayambaje, I., & Muwonge, C. M. (2023). Relationships of mathematics achievement with self-determined motivation and mathematics anxiety among senior two students in Northern Rwanda. Heliyon, 9(4), 1–11. https://doi.org/10.1016/j.heliyon.2023.e15411

Jaccard, D., Bonnier, K. E., & Hellström, M. (2022). How might serious games trigger a transformation in project management education? Lessons learned from 10 Years of experimentations. Project Leadership and Society, 3, 1–9. https://doi.org/10.1016/j.plas.2022.100047

Korhonen, H., Tuomikoski, A.-M., Oikarainen, A., Kääriäinen, M., Elo, S., Kyngäs, H., Liikanen, E., & Mikkonen, K. (2019). Culturally and linguistically diverse healthcare students' experiences of the clinical learning environment and mentoring: A qualitative study. Nurse Education in Practice, 41, 1–7. https://doi.org/https://doi.org/10.1016/j.nepr.2019.102637

Laakso, N. L., Korhonen, T. S., & Hakkarainen, K. P. J. (2021). Developing students' digital competences through collaborative game design. Computers & Education, 174, 1–15. https://doi.org/10.1016/j.compedu.2021.104308

Lee, Y., Kim, T. S., Chang, M., & Kim, J. (2022). Interactive Children's Story Rewriting Through Parent-Children Interaction. In H. T.-H., R. V., K. D., C. J.J.Y., G. D., L. M., & G. K.I. (Eds.), 1st Workshop on Intelligent and Interactive Writing Assistants, In2Writing 2022 (pp. 62–71). Association for Computational Linguistics (ACL).

Li, B. (2022). Ready for Online? Exploring EFL Teachers' ICT Acceptance and ICT Literacy During COVID-19 in Mainland China. Journal of Educational Computing Research, 60(1), 196–219. https://doi.org/10.1177/07356331211028934

Liu, C.-Y., & Wu, C.-J. (2022). STEM without art: A ship without a sail. Thinking Skills and Creativity, 43, 1–12. https://doi.org/10.1016/j.tsc.2021.100977

Liu, Y., Zheng, X., & Hau, K.-T. (2023). Would emphasizing the instrumental value of learning help unmotivated students? Large-scale cross-cultural comparisons. Personality and Individual Differences, 207, 112148. https://doi.org/10.1016/j.paid.2023.112148

Malaquias, R. F., & Malaquias, F. F. D. O. (2021). A literature review on the benefits of serious games to the literacy process of children with disabilities and learning difficulties. Technology and Disability, 33(4), 273–282. https://doi.org/10.3233/TAD-210339

McLaren, B. M., Richey, J. E., Nguyen, H., & Hou, X. (2022). How instructional context can impact learning with educational technology: Lessons from a study with a digital learning game. Computers & Education, 178, 1–20. https://doi.org/10.1016/j.compedu.2021.104366

Moyer-Packenham, P. S., Lommatsch, C. W., Litster, K., Ashby, J., Bullock, E. K., Roxburgh, A. L., Shumway, J. F., Speed, E., Covington, B., Hartmann, C., Clarke-Midura, J., Skaria, J., Westenskow, A., MacDonald, B., Symanzik, J., & Jordan, K. (2019). How design features in digital math games support learning and mathematics connections. Computers in Human Behavior, 91, 316–332. https://doi.org/10.1016/j.chb.2018.09.036

Murugiah, L., Ismail, R., Taib, H. M., Applanaidu, S. D., & Long, M. N. H. B. H. (2023). Children's understanding of financial literacy and parents' choice of financial knowledge learning methods in Malaysia. MethodsX, 11, 1–12. https://doi.org/10.1016/j.mex.2023.102383

Nicholas, J., Mills, B., Hansen, S., Bright, S. J., Boyd, H., Brook, L., Watson, J., & Hopper, L. (2022). Developing an alcohol and other drug serious game for adolescents: considerations for improving student engagement. Australian and New Zealand Journal of Public Health, 46(5), 682–688. https://doi.org/10.1111/1753-6405.13287

Nikolopoulou, K., Akriotou, D., & Gialamas, V. (2019). Early Reading Skills in English as a Foreign Language Via ICT in Greece: Early Childhood Student Teachers' Perceptions. Early Childhood Education Journal, 47(5), 597–606. https://doi.org/10.1007/s10643-019-00950-8

Qiu, Y., & Luo, W. (2022). Investigation of the effect of flipped listening instruction on the listening performance and listening anxiety of Chinese EFL students. Frontiers in Psychology, 13, 1–11. https://doi.org/10.3389/fpsyg.2022.1043004

Reynaldo, C., Christian, R., Hosea, H., & Gunawan, A. A. S. (2021). Using Video Games to Improve Capabilities in Decision Making and Cognitive Skill: A Literature Review. Procedia Computer Science, 179, 211–221. https://doi.org/10.1016/j.procs.2020.12.027

Salaberri, M., Gil, M., & Sylla, C. (2021). GamAll: Playing Beyond Boundaries - Gamification and Multimodal Literacy. In B. E.I., B. A., S. C., & M. A.K. (Eds.), 5th EAI International Conference on Design, Leaning and Innovation, DLI 2020 (Vol. 366, pp. 140–147). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-030-78448-5_10

Sun, L., Ruokamo, H., Siklander, P., Li, B., & Devlin, K. (2021). Primary school students' perceptions of scaffolding in digital game-based learning in mathematics. Learning, Culture and Social Interaction, 28, 1–11. https://doi.org/10.1016/j.lcsi.2020.100457

Trakulphadetkrai, N. V, Aerila, J.-A., & Yrjänäinen, S. (2019). Bringing Mathematics Alive Through Stories. Educating the Young Child, 16, 199–225. https://doi.org/10.1007/978-3-030-19266-2_11

Uskoković, V. (2023). Natural sciences and chess: A romantic relationship missing from higher education curricula. Heliyon, 9(4), 1–28. https://doi.org/10.1016/j.heliyon.2023.e15015

Vanbecelaere, S., Van den Berghe, K., Cornillie, F., Sasanguie, D., Reynvoet, B., & Depaepe, F. (2020). The effects of two digital educational games on cognitive and non-cognitive math and reading outcomes. Computers & Education, 143, 1–15. https://doi.org/10.1016/j.compedu.2019.103680

Weinhandl, R., Mayerhofer, M., Houghton, T., Lavicza, Z., Kleinferchner, L. M., Anđić, B., Eichmair, M., & Hohenwarter, M. (2024). Enhancing user-centred educational design: Developing personas of mathematics school students. Heliyon, 10(2), 1–16. https://doi.org/https://doi.org/10.1016/j.heliyon.2024.e24173

Yeh, Y., Chang, H.-L., & Chen, S.-Y. (2019). Mindful learning: A mediator of mastery experience during digital creativity game-based learning among elementary school students. Computers & Education, 132, 63–75. https://doi.org/10.1016/j.compedu.2019.01.001

Yıldırım, M. (2022). Digital Art in Children's Education. In B. K. Yerdelen, K. Elbeyoğlu, O. Sirkeci, Y. M. Işıkçı, S. Grima, & R. E. Dalli Gonzi (Eds.), Being a Child in a Global World (pp. 203–208). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80117-240-020221021