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THE BENEFITS OF IMPLEMENTING TABLETOP GAMES IN TEACHING AND LEARNING: A REVIEW OF THE LITERATURE

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Abstract:

Gamification in education has gained significant popularity, leading to extensive research across various disciplines. Among these approaches, educational tabletop games have emerged as highly interactive and effective tools for teaching and learning. Tabletop games, which are played on a flat surface following specific rules without digital support, offer unique educational benefits. This study aims to review existing literature on the impact of educational tabletop games in diverse educational settings. Employing a systematic review and qualitative content analysis, the authors examined 20 research articles published between 2020 and 2024 from three databases: Science Direct, Scopus, and Sage Journals. The reviewed literature highlights the positive effects of educational tabletop games on students' cognitive skills, engagement and motivation, learning and retention, and skills development. These games significantly enhance numerical abilities, critical thinking, problem-solving, and collaboration among students. The interactive nature of tabletop games promotes active participation and long-term retention of course material, making them a valuable tool in various educational contexts. Overall, educational tabletop games demonstrate versatility and effectiveness across different disciplines. As gamification continues to rise in education, further

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research is needed to explore educational game design and identify key features that can help educators create valuable and impactful learning experiences.

Keywords:

Gamification, Educational Tabletop Game, Student Engagement, Learning Retention, 21st Century Skill

Introduction

The term 'gamification' is used to describe the utilisation of game elements and game design techniques in non-game contexts. The objective is to motivate users and increase user retention, engagement, and happiness (Chan et al., 2024; Alsawaier, 2018; Deterding et al., 2011). The objective of gamification in learning is to integrate game mechanics and technologies into a non-game learning environment with the intention of motivating and engaging students in the pedagogic process (Kapp, 2012), while simultaneously enhancing learning (Alsawaier, 2018). This approach exploits the motivational qualities of games to create more engaging and enjoyable learning experiences. Nevertheless, Christopolous and Mystakidis (2023) has cautioned that while some people may find gamified elements motivating, some may also find them distracting. The concept of gamification has gained considerable attention in recent years in the educational sector, driven by the necessity to make learning more appealing and effective for students across all age groups. In addition to that, gamification is adopted to foster more engaging and participatory learning environments. Because of this, there is a rapidly growing trend of gamification in education, be it in the forms of digital games such as computer games or non-digital games such as tabletop games, with an increasing number of studies attesting to its favourable effect on learning outcomes. This study shall focus on the literatures related to educational tabletop games.

Definition and Scope of Educational Tabletop Games

Educational tabletop games are a specific subset of gamification that involves the use of physical board games, card games, and similar formats to achieve educational objectives. As defined by Boller and Kapp (2017), tabletop games are those played with pieces or cards on a board in accordance with a set of rules, without the use of computers or digital technology. In contrast to digital games, tabletop games necessitate direct, face-to-face interaction, thereby offering a valuable avenue for the cultivation of social abilities concurrently with academic knowledge. The scope of these games extends to a wide range of subject matter, including basic numeracy and literacy in early childhood education and more complex scientific concepts, as well as strategic thinking, in higher education. Based on Martin et al. (2021) and Boller and Kapp (2017), the scope of educational tabletop games is extensive, encompassing a multitude of game mechanics and instructional strategies, which are tailored to cater to the diverse needs of learners at various educational levels and to facilitate a range of learning outcomes. As a method of gamification for teaching and learning, educational tabletop games offer distinctive advantages. The incorporation of elements such as competition, collaboration, and narrative can transform the mundane educational task into an engaging challenge.

Research Purpose and Research Question

The purpose of this study is to explore the benefits of implementing educational tabletop games in teaching and learning. Specifically, it aims to identify the various educational advantages of these games in diverse settings and examine their application in achieving educational

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objectives. The study seeks to answer the research question: "What are the benefits of educational tabletop games, and how educational tabletop games impact teaching and learning process?"

Method

This study employed a systematic review technique to address the research questions by identifying, critically evaluating and synthesising the findings of all relevant studies that explore the benefits and applications of educational tabletop games in teaching and learning. Systematic reviews are recognised for their ability to provide a comprehensive overview of a research topic by synthesising existing information in an unbiased and thorough manner (Siddaway et al., 2019). By utilising this methodology, the researchers aimed to provide a detailed understanding of the application of educational tabletop games in teaching and learning processes.

Searching and Screening

The database search for this systematic review included articles covering the benefits of using educational tabletop games in teaching and learning. We utilized three electronic databases: Science Direct, Scopus, and Sage Journals. The search was conducted using the phrase searching function and the Boolean operators OR and AND to combine keywords in the advanced searching process. The keywords used were "board game" OR "tabletop game" OR "unplugged game" OR "non-digital game" OR “serious game” AND "teaching" OR "learning", applied to the article title, abstract, and keywords. Additionally, this study employed three main techniques for manual searching: handpicking, backward tracking, and forward tracking, ensuring comprehensive coverage of relevant literature.

The search was limited to articles published between 2020 and 2024, and only articles written in English were considered. Only peer-reviewed articles were included in the document to ensure the quality and relevance of the sources. In order to be included in the study, articles had to meet the following criteria: (a) empirically oriented, (b) utilising tabletop games for pedagogical purposes, and (c) examining the impact and benefits of tabletop games. A total of 119 articles were initially retrieved from the aforementioned databases and subjected to a preliminary screening to ascertain their eligibility. Following the application of the inclusion criteria, only 20 articles were identified as meeting all the specified criteria and were thus selected for further analysis. This rigorous screening process ensured that the review included only studies that provided substantial evidence on the educational benefits and applications of tabletop games in various educational contexts.

Findings

Based on the analysis of the literature review, the themes that emerged indicate that educational tabletop games can (i) enhance cognitive skills, (ii) increase engagement and motivation, (iii) improve learning and retention, and (iv) develop 21st century skills

Enhanced Cognitive Skills

The implementation of tabletop games in educational settings has shown significant benefits in enhancing cognitive skills among students. Gasteiger and Moeller (2021) and Lin (2022) both found that specific types of board games significantly improved the numerical skills of preschool children. Gasteiger and Moeller (2021) highlighted the improvement in counting skills and conceptual subitizing through conventional board games with traditional dot dice,

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while Lin (2022) focused on the effectiveness of linear number line games in enhancing young children's number line estimation and basic arithmetic skills. In contrast, Wang et al. (2024) examined a more advanced educational context, finding that a board game-facilitated teaching approach for ICU nurses significantly improved their knowledge and clinical reasoning skills related to ECMO care. This study contrasts with those on preschoolers by focusing on adult learners in a professional setting, highlighting that the interactive nature of the games, focusing on ECMO knowledge recall and emergency scenarios, promotes critical thinking and decision-making. Similarly, Bortoli et al. (2023) and Junior et al. (2023) explored board games aimed at high school and undergraduate students, respectively. Bortoli's "Chemical Quest" and Junior's "CR322" both aimed to enhance understanding of chemistry. Both studies illustrate how games can be tailored to different educational levels and subjects to enhance cognitive skills through active engagement and immediate feedback.

Increased Engagement and Motivation

Tabletop games have been shown to boost student engagement and motivation in learning across various educational contexts. Kalkan et al. (2022) and Hsieh et al. (2023) both reported an increase in student motivation and enjoyment through the use of educational games, but in different settings. Kalkan et al. (2022) found that crossword and word search puzzles in nursing education increased students' motivation and enjoyment by making the learning process more engaging, while Hsieh et al. (2023) observed that a board game-based fire safety educational program was more effective than traditional drills in improving fire safety knowledge and attitudes among Taiwanese nurses. Both studies highlighted the motivational benefits of interactive learning tools.

Robinson et al. (2021) and Guest et al. (2021) also explored the engagement benefits of role-play and thematic board games. Robinson et al. (2021) discussed the benefits of role-play board games in geographical and planning-related teaching, which fostered active participation, discussion, and debate among students by simulating real-world scenarios. Guest et al. (2021) investigated "Everybody's Different: The Appearance Game," which aimed to increase knowledge of appearance-related issues among children. Both studies emphasized the interactive and collaborative nature of these games in fostering engagement.

Filomena et al. (2023) and Ng et al. (2021) extended the theme of enhanced cognitive skills by demonstrating how specific content can be effectively taught through engaging board game formats. "Ruaumoko" board game designed by Filonema et al. (2023) improved high school students' perception of seismic risk through real-world simulation. The game successfully heightened students' disaster preparedness and risk awareness by immersing them in scenario-based learning. Similarly, "Pick and Speak" a board game designed by Ng et al. (2023) for primary school students, enhanced English-speaking skills and communication abilities. Both games applied board game mechanics to create engaging gameplay, leading to increased student motivation and a deeper understanding of the subject matter. Despite focusing on different educational areas, the studies demonstrate that incorporating tabletop games into the curriculum can significantly improve student engagement and learning outcomes.

Developed 21st Century Skills

In addition to cognitive benefits and increased engagement, tabletop games contribute to the development of 21st century skills such as critical thinking, problem-solving, and collaboration. Chen et al. (2021) and Bangalee et al. (2021) both demonstrated the skill development benefits

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of educational games in different contexts. Chen's "Element Enterprise Tycoon" improved high school students' creative problem-solving skills and chemistry knowledge by requiring them to make decisions about using chemical elements, techniques, and products, balancing profit, environmental quality, and social needs. The collaborative gameplay encouraged discussion and teamwork, enhancing both CPS skills and understanding of chemistry. Bangalee et al. (2021) found that "PharmacyPhlash" improved communication, collaboration, and time management skills among pharmacy students. By working in teams and describing terminology while others guessed, students were encouraged to think and communicate quickly and concisely, fostering better teamwork and time management.

Studies of Agbo et al. (2023) and Sunay and Erdogan (2024) focused on the development of computational thinking and mathematical reasoning skills. Agbo et al. (2023) found that unplugged activities significantly improved novice students' computational thinking skills and problem-solving abilities, providing practical, hands-on experience in applying computational thinking concepts. Sunay and Erdogan (2024) highlighted the importance of reflected game functions in developing mathematical reasoning, demonstrating that analyzing and discussing moves and strategies enhances students' heuristic, explanatory, and checking skills. In addition, study of Ng et al. (2021) demonstrated that the "Pick and Speak" board game effectively improved primary school students' speaking skills in English. The game's focus on sentence construction, vocabulary, pronunciation, and grammar, combined with its interactive and engaging format, made it a valuable addition to the ESL classroom, fostering collaboration and communication skills.

Conclusion and Recommendations

Based on the analysis above, related studies have demonstrated that educational tabletop games represent a dynamic and effective approach to teaching and learning. By integrating engaging game elements with educational content, these tools significantly enhance student motivation, learning outcomes, and skills development. The incorporation of tabletop games into educational settings not only makes learning more enjoyable and engaging but also fosters the development of essential life skills, establishing them as a valuable addition to modern educational practices. These findings are consistent across diverse educational contexts, ranging from early childhood education to higher education and professional training.

To fully realize the potential benefits of educational tabletop games and address the challenges associated with their implementation, continued research and development in this field are essential. This review identified several areas for further investigation, including the need for longitudinal studies to assess the long-term impact of tabletop games on learning outcomes. Future research may explore effective methods for developing tabletop games tailored for teaching and learning. This involves investigating game design principles and educational strategies that maximize engagement and learning outcomes. Additionally, comparing the impacts of digital games and unplugged tabletop games could provide valuable insights into how each format contributes to various aspects of student learning and engagement. Such comparisons may guide educators in selecting the most appropriate tools for their specific teaching contexts and objectives.

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