

Teacher Strategies Through Educational Games in Managing the Dynamics of Mathematics Learning Groups to Grow Interest in Learning

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Kata Kunci:

Dinamika kelompok, Permainan edukatif, Minat belajar, Strategi guru, Pembelajaran matematika.

Abstrak

Penelitian ini dilakukan untuk menganalisis strategi guru dalam menerapkan permainan edukatif untuk mengelola dinamika kelompok dan juga menumbuhkan minat siswa dalam mempelajari matematika. Penelitian ini didorong oleh persepsi siswa bahwa matematika adalah mata pelajaran yang menakutkan dan membosankan yang mengakibatkan interaksi pasif dalam belajar kelompok. Penelitian ini menggunakan pendekatan kualitatif dengan tipe studi kasus dan subjeknya meliputi guru matematika dan juga siswa yang terlibat dalam pembelajaran kelompok. Pengumpulan data dilakukan melalui empat instrumen: wawancara, observasi aktivitas, tes prestasi belajar, dan juga studi dokumentasi. Teknik analisis data yang diterapkan adalah model interaktif Miles dan Huberman. Hasil penelitian menunjukkan bahwa penerapan permainan edukatif secara efektif mengubah dinamika kelompok dari pasif menjadi kolaboratif dengan nilai observasi rata-rata 3,14 (kategori Baik). Secara akademis, mayoritas siswa (72%) mencapai kategori Baik dan Sangat Baik. Hal ini juga menunjukkan bahwa permainan edukatif membantu membangun lingkungan sosial yang interaktif dan suportif (pembelajaran yang menyenangkan), yang secara bersamaan cenderung meminimalkan persepsi negatif dan juga meningkatkan antusiasme serta ketekunan siswa dalam belajar, sementara kebaruannya terletak pada peran permainan edukatif sebagai alat manajemen konflik dan juga penambah kekompakan kelompok, dan bukan hanya sebagai media penyampaian materi.

Key Word:

Group dynamics, Educational games, Learning interest, Teacher strategies, Mathematics learning.

Abstract

This research was done in order to analyze strategies of teachers in applying educational games to manage group dynamics and also foster interest of students in studying mathematics. This research is encouraged by perceptions of student' that mathematics is a frightening and boring subject which outcomes in passive interaction of studying in groups. It applied a qualitative approach with a case study type and the subjects included mathematics teachers and also students involved in group learning and data collection was done through four instruments: interviews and activity observations and learning achievement tests and also studies of documentation. The data analysis technique applied the Miles and also Huberman interactive model. The outcomes indicate that the implication of educational games effectively changed group dynamics from passive to collaborative with an average observation value of 3.14 (the Good category). Academically the majority of students (72%) reached the Good and also Very Good categories. These also indicate that educational games help building an interactive and also supportive social environment (joyful learning), that simultaneously tended to minimize negative perceptions and also increases students' enthusiasm and also perseverance in studying while the novelty lies in the role of educational games as a conflict management tool and also group cohesiveness enhancer and not simply a medium for delivering material.

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PENDAHULUAN

Mathematics education takes such a crucial and strategic role in the global system of education. In the 21st century known to be characterized by a knowledge-based economy and also mastery of mathematical competencies can become important for developing higher-order skills of thinking such as logical and also critical reasoning (Putri et al., 2025). However the reality on the ground said fundamental problems. Mathematics can be often perceived as a difficult and abstract and also intimidating subject then triggering math anxiety (Kamarullah, 2017). This psychological condition can hinder student participation, decrease motivation and also result in poor academic performance (Asri et al., 2024).

The influence of this low interest is clearly seen in dynamics of classroom. According to initial observations indicate that students tend to be passive and unresponsive and also reluctant to ask questions

then they have difficulty to solve problems (Sandri et al., 2023; Silitonga et al., 2023). Yet the classroom is just a small social system where interaction of students takes a vital role in successful process of studying (Arifin, 2021). This lack of interaction is exacerbated by monotonous conventional methods of teaching where teachers predominantly lecture.

To address this the role of teachers should shift from merely conveying information to becoming dynamic and also innovative facilitators (Hakim, 2024). Strategies are shown to create a joyful learning environment with one is through the use of educational games. Educational games serve not only as entertainment but also as a proven medium to help improving conceptual understanding (Maharani et al., 2024). Furthermore the integration of technology into educational games such as the use of Wordwalls it has been shown to rekindle the studying spirit of students in elementary and also secondary school (Indrapangastuti & Aulia, 2024; Afidah & Subekti, 2024).

Although the effectiveness of games on individual learning outcomes has been widely demonstrated (Septianing et al., 2024; Soleha, 2024), little research has examined the role of games as a tool for managing group social dynamics. In fact, good group dynamics, including communication, cooperation, and conflict management, are key to successful collaborative learning (Sabet et al., 2024). Latif's (2020) research demonstrates the potential of games in counseling to lighten the mood, but it has not been extensively studied specifically as a core strategy in academic mathematics learning.

The novelty of this research lies in the testing of a functional relationship model that places teacher strategies through the implementation of educational games as the main driving element for managing group dynamics (mediating variable), which ultimately aims to foster student learning interest (dependent variable). Based on this background, this study aims to describe teacher strategies in managing group dynamics through educational games and analyze their impact on students' interest in learning mathematics.

METODE

This study applied a qualitative approach with a case study design in order to explore teacher strategies in a context of natural classroom (Creswell, 2014). The subjects were taken by applying a purposive sampling technique and consisting of one mathematics teacher and also 32 11th-grade students shared into small groups.

The data collecting procedure was done through triangulation techniques that included: (1) In-depth interviews with teachers and student representatives to explore perceptions regarding group interests and dynamics; (2) Participatory observation by structured observation sheets to record social interactions and also involvement of students during playing educational games; and (3) Learning result tests and RPP documentation to help measure the influence of strategy implementation.

Data analysis was done using an interactive model from (Miles, Huberman, and Saldana 2014) which consists of three simultaneous stages: data condensation then data display and conclusion drawing/verification. Data validity was tested through triangulation of sources and also techniques to help ensuring the validity of the research findings.

HASIL DAN PEMBAHASAN

The implication of educational game strategies in mathematics studying stated such a measurable impacts on achievement of students' academic and aksisocial behavior. Learning outcome data obtained through post-tests indicated a positive trend in student mastery of the material as summarized in Table 1.

Table 1. Distribution of Student Learning Outcomes (Post-Test)

Value Interval	Frequency	Percentage	Category
93-100	8	25%	Very good
84-92	15	47%	Good
75-83	6	19%	Enough
<75	3	9%	Not enough
Total	32	100%	

According to to Table 1, the students' majority of achievement was in the high category. Seventy-two percent of students can exceeded the good score threshold (interval >84) showing that the use of educational games effectively giving facilitated understanding of mathematical concepts. Although a small number of students (9%) stated in the poor category then analysis of the answer sheets showed that the majority of errors were procedural not fundamental conceptual.

In addition to cognitive aspects here are significant changes were recorded in affective and also psychomotor aspects. Intensive observation of student interactions during the game showed shifts in group dynamics and also studying interests.

Table 2. Results of Observations on Group Dynamics and Learning Interest

No	Observed Aspects	Average Score	Category	Field Description
A	GROUP DYNAMICS			
1	Interaction & Communication	4.00	Very good	Students actively discuss strategies
2	Collaboration & Cooperation	3.00	Good	There is a clear division of roles.
3	Member Participation	3.00	Good	Quiet students start to dare to speak
4	Conflict Management	2.00	Not good	Try both ways when there is a difference of opinion
B	INTEREST IN LEARNING			
5	Enthusiasm	4.00	Very good	Cheerful faces, cheers when right
6	Focus & Concentration	3.00	Good	No one is chatting off topic
7	Perseverance	3.00	Good	Retry when answer is wrong
	Average Total	3.14	Good	

From Table 2, the "Interaction & Communication" and "Enthusiasm" aspects were the indicators with the highest scores. This shows that educational games successfully break the ice that has been a barrier in conventional math classes. An interesting finding was seen in the "Conflict Management" aspect, which had the lowest score, but field descriptions indicated a constructive process, where students learned to negotiate to determine the most appropriate answer.

The findings provide an empirical overview of the effectiveness of teacher strategies in orchestrating game-based learning. Transforming Group Dynamics Through Structured Interactions: Teachers' strategies by applying educational games indicated to transform the classroom climate from passive into collaborative. Perfect scores toward communication aspect (Table 2) confirm that games create "positive interdependence" among group members. Consistent with the outcomess of Damayanti et al. (2023) cooperative studying packaged of games stimulates motivation of students to actively contribute. This interaction is not simply an exchange of information but also an emotional bridge which try to reduce students' mathematical anxiety and consistent with Latif's (2020) proposition which a relaxed atmosphere in games facilitates group communication.

Accelerating Learning Interest in a Joyful Learning Environment The surge in student enthusiasm proves that negative perceptions of mathematics are able to be designed. Educational games shift students' mindsets from "math as a burden" to "math as a challenge." Zaenuri and Walid's (2024) theory which states that the competitive and also fun elements in games are able to boost intrinsic motivation. Students' persistence in learning despite incorrect answers stated the development of grit, a vital indicator of learning interest (Nurfazri & Nuraida, 2024).

The Strategic Role of Teachers as Dynamic Facilitators The success is inseparable from the teacher's capability to help manage cognitive problems. A lower management of conflict score compared to other aspects shows that the process of learning is undergoing naturally. Teachers take such a role in maintaining healthy competition and also resolving conflicting perspectives through mathematical proof not personal dominance while this strategy validates Hakim's (2024) modern teachers should act as designers of dynamic learning experiences and not simply conveyors of material.

KESIMPULAN

This study concludes that the strategy of teachers through the use of educational games has proven effective to manage group dynamics while fostering students' interest to learn mathematics. Measurably the success of managing dynamics of group is revealed by the achievement of an average observation score of 3.14 (Good category) where there is found a transformation of interaction of student from passive-individualistic to active-collaborative. This supportive environment of social is positively related with increased interest and also results and marked by 72% of students reaching the Good and Very Good categories. The implementation also emphasize that educational games have not only be taken as icebreakers, but also as a core strategy for teachers on purpose to build class cohesiveness and also minimize mathematical anxiety. Further studies are recommended to expand the scope by comparing the effectiveness of digital-based and non-digital games toward student interest of learning retention at different levels of education..

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