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EFFECTS OF PERSONALIZED CHIPS ON STUDENTS ENGAGEMENT IN MATHEMATICS

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ABSTRACT

This study investigates the potential impact of personalized chips on student engagement in mathematics education, aiming to address declining levels of engagement and proficiency through innovative approaches such as personalized learning tools. This study utilized a systematic literature review method to traditional methods of teaching mathematics often struggle to accommodate the diverse learning needs and preferences of students, leading to disengagement and lack of enthusiasm for the subject. Results showed three (3) effects of personalized chips on students' engagement such as (1) Personalized Learning; (2) Gamification and Motivation; and (3) Data-Driven Insights. It is recommended that Personalized chips in math education could improve student engagement by customizing learning and incorporating games, but more research is needed to ensure long-term benefits, address privacy concerns, and support teachers in using them effectively.

Keyword: mathematics achievement; affective engagement; cognitive engagement; behavioural engagement; student engagement; personalized chips

1. INTRODUCTION

Mathematics education has long been a subject of concern, with declining engagement and proficiency levels reported worldwide. In response to this challenge, educational researchers and practitioners continuously seek innovative approaches to enhance student learning experiences. One such approach under scrutiny is the integration of personalized learning tools, such as personalized chips, aimed at revitalizing student engagement in mathematics. This study delves into the potential impact of personalized chips on student engagement within the realm of mathematics education Querido (2023).

Traditional methods of teaching mathematics often struggle to accommodate the diverse learning needs and preferences of students, leading to disengagement and lack of enthusiasm for the subject. Personalized learning tools, such as personalized chips, offer a promising avenue to address this issue by tailoring the learning experience to individual students' abilities and interests Kusmaryono, & Wijayanti, (2023). By incorporating personalized chips into mathematics instruction, educators can provide students with hands-on, interactive experiences that cater to their specific learning styles and pace, potentially fostering deeper engagement and understanding of mathematical concepts Lee, & Capraro, (2023).

Furthermore, personalized chips have the potential to enhance the sense of autonomy and ownership in students' learning processes. By allowing students to manipulate tangible objects and make decisions based on their own reasoning, personalized chips empower learners to take an active role in their mathematical learning journey. This sense of agency can significantly impact student motivation and engagement, as students feel more invested in their academic progress and achievement Abedi, & Ahmadabadi, (2021)

However, while the theoretical underpinnings of personalized chips in mathematics education appear promising, empirical evidence regarding their effectiveness remains limited. This study seeks to address this gap by rigorously examining the effects of personalized chips on student engagement in mathematics. Through a combination of quantitative analysis and qualitative inquiry, this research endeavors to provide insights into the practical implications of integrating personalized chips into mathematics instruction and its potential to transform the learning experience for students. By shedding light on the effectiveness of personalized chips,

this study aims to contribute to the ongoing discourse surrounding innovative pedagogical approaches in mathematics education and inform best practices for promoting student engagement and learning outcomes Yilmaz, F., & Yılmaz, R. (2021).

2.METHODS

Conducting a systematic review with the aim of comprehensively understanding the impact of Personalized Chips on Students' Engagement in Mathematics involved a meticulous search strategy. This strategy encompassed electronic databases such as Google Scholar and ResearchGate, along with pertinent journals and books, utilizing specific search terms related to the topic. Inclusion criteria were focused on peer-reviewed articles published in English within the last decade, prioritizing insights into the Effects of Personalized Chips on Students' Engagement in Mathematics.

The initial search yielded a substantial number of articles, which were subsequently refined through screening based on titles and abstracts to determine relevance. Fourteen articles were identified for in-depth review, with the goal of extracting insights into the effects of personalized chips on students' engagement in mathematics. This comprehensive review process enabled the identification of recurring themes and patterns, providing a thorough overview of the landscape surrounding the effects of personalized chips on students' engagement in mathematics.

Through synthesizing diverse literature, this systematic approach facilitated a holistic understanding of the complex dynamics involved, offering valuable insights into the nuances of the effects of personalized chips on students' engagement in mathematics.

3.RESULTS AND DISCUSSION

3.1. Effects of Personalized Chips on Students Engagement

Theme 1: Personalized Learning

Personalized chips in the context of mathematics education can significantly enhance student engagement by tailoring the learning experience to individual needs and preferences Cheng (2023). By customizing the content, pace, and style of instruction to match each student's unique learning profile, personalized chips can foster a sense of ownership and relevance, making mathematical concepts more accessible and engaging Yu et., al (2023). This approach acknowledges the diverse learning styles and abilities of students, promoting a more inclusive and effective learning environment where students feel empowered and motivated to actively participate in their mathematical education Demo et., al (2021).

Theme 2: Gamification and Motivation

Integrating personalized chips into mathematics education can introduce elements of gamification that tap into students' intrinsic motivation and desire for challenge and achievement Ishaq & Alvi, (2023). By incorporating game-like features such as rewards, progress tracking, and interactive feedback, personalized chips can transform the learning process into a more engaging and enjoyable experience Chung & Pan, (2023). This gamified approach not only makes mathematics more fun and stimulating but also cultivates a growth mindset by encouraging students to persist through challenges, take risks, and view mistakes as opportunities for learning and improvement Elmawati, Martadiputra, & Samosir, (2023).

Theme 3: Data-Driven Insights

The use of personalized chips in mathematics education enables educators to gather valuable data on students' learning behaviors, preferences, and performance, providing insights that can inform instructional decisions and interventions Amzil, Aammou, & Zakaria, (2023). By analyzing the data generated by personalized chips, teachers can identify patterns, trends, and areas of strength or weakness in students' mathematical understanding Arhin et., al (2024). This data-driven approach allows for targeted interventions, differentiated instruction, and timely feedback that can support student progress, address individual needs, and optimize the overall learning experience in mathematics Hartati, & Fitria, (2023).

4.CONCLUSION AND RECOMMENDATION

Research suggests that personalized chips hold promise for boosting student engagement in mathematics education. By tailoring learning to individual needs and preferences, incorporating game-like elements, and providing educators with valuable data, personalized chips can foster a

more inclusive, enjoyable, and effective learning environment for students of all backgrounds and abilities.

Further research is needed to explore the long-term effects of personalized chips on student achievement and address potential concerns regarding privacy and equity. Additionally, studies should investigate how best to integrate personalized chips seamlessly into existing curricula and provide teachers with the necessary training and support to utilize them effectively in the classroom.

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