

From Local Culture to Digital Interaction: Analysis for Developing Leap Motion with an Ethnomathematic for Fraction Learning

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Abstract:

Fraction learning in elementary schools still faces serious challenges in Indonesia for understanding of concepts due to approaches that tend to be abstract and lack context. The learning media not yet able to support active interaction and meaningful learning experiences. This study aims to analyze the needs of fraction learning and formulate specifications for Leap Motion-based ethnomathematics learning media that are in line with the cognitive development characteristics of elementary school students. This study is the initial part of a Research and Development study using the ADDIE model, focusing on the Analysis stage. The methods used include observing the fraction learning process in elementary schools, interviewing teachers, analyzing curriculum documents and basic competencies, analyzing student characteristics, and reviewing the learning media that has been used. The results of the analysis show that students need learning media that is concrete-digital, interactive, and contextual to help visualize abstract fraction concepts. The findings also indicate that elementary school students are at the concrete operational stage, so they need manipulative and visual activities that are in line with their real experiences. Based on these analysis results, Leap Motion technology was chosen because it allows hand-based interaction as learning input, thereby supporting kinesthetic and visual learning simultaneously. The integration of ethnomathematics based on Surabi as a cultural product unique to Bandung City is considered relevant to bridge formal mathematical concepts with the cultural experiences of students in Indonesia. This research contributes to SDGs 10 for development of inclusive, contextual, and technology-based learning media.

Keywords:

Mobile learning, ethnomathematics, Leap Motion, Realistic Mathematics Education, fraction.