# Development of Nearpod-Based Interactive Learning Media on Set Material

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## Abstrak

Penelitian ini bertujuan menngembangkan media pembelajaran interaktif berbasis nearpod. Penelitian pngembangan ini dilatarbelakangi oleh kurangnya penggunaan media pembelajaran pada mata pelajaran matematika materi konsep himpunan, yang menyebabkan beberapa siswa kelas VII kesulitan memahami materi tersebut. Oleh karena itu, media pembelajaran berbasis Nearpod diharapkan dapat menjadi solusi alternatif. Penelitian ini menggunakan model pengembangan ADDIE yang meliputi lima tahapan: Analysis, Design, Development, Implementation, dan Evaluation. Subjek penelitian ini siswa kelas VII SMP. Instrumen yang digunakan meliputi lembar validator ahli materi dan media, angket responden guru dan siswa, serta pretest dan posttest. Hasil penelitian menunjukkan bahwa media pembelajaran interaktif berbasis Nearpod memiliki nilai kevalidan dari ahli materi sebesar 81,66% (Valid) dan ahli media sebesar 83,15% (Valid). Nilai kepraktisan dari angket guru sebesar 98,00% (Sangat Praktis), serta dari siswa sebesar 87,63% (uji coba terbatas) dan 85,21% (uji coba luas), keduanya berkategori Sangat Praktis. Keefektifan media ini berdasarkan rata-rata skor N-gain adalah 57,04 (Cukup Efektif).
Kata Kunci: Himpunan; Media Pembelajaran Nearpod; Model ADDIE

## Abstract

This research aims to develop nearpod-based interactive learning media. This development research is motivated by the lack of use of learning media in mathematics subjects on set concept material, which causes some 7th grade students to have difficulty understanding the material. Therefore, Nearpod-based learning media is expected to be an alternative solution. This research uses the ADDIE development model which includes five stages: Analysis, Design, Development, Implementation, and Evaluation. The subjects of this research grade VII Junios High Scholl students. The instruments used include material and media expert validator sheets, teacher and student respondent questionnaires, as well as pre-tests and post-tests. The results showed that Nearpod-based interactive learning media had a validity value from material experts of 81.66% (Valid) and media experts of 83.15% (Valid). The practicality value from the teacher questionnaire was 98.00% (Very Practical), as well as from students of 87.63% (limited trial) and 85.21% (broad trial), both of which were categorized as Very Practical. The effectiveness of this media based on the average N-gain score is 57.04 (Moderately Effective).
Keywords: Set; Nearpod Learning Media; ADDIE Model

## I. INTRODUCTION

The contemporary educational landscape, adapting to the rapid advancements in technology and information is paramount. Experts such as Lestari (2018), Arshad (2016), Kudsiyah and Harmanto (2017), and Anggreini (2022) underscore technology's role in scientific development within education, advocating for its integration to foster innovation in the learning process. One form of technology integration to encourage innovation in the learning process is through learning media.

Learning media is a means that supports the teaching and learning process while also functioning to clarify the messages delivered during learning, so that the intended learning objectives can be achieved (Abdullah & Yunianta, 2018; Pusporini et al., 2023). Indah & M. Husni (2013) state that learning media functions as a tool for delivering messages in order to achieve learning objectives. In mathematics, the use of learning media can make learning activities more engaging and enjoyable, while also helping students to better understand the material and encouraging them to study both in class and independently (Dewi & Isroah, 2016; Safitra, Hapizah, Mulyono, & Susanti, 2023). This suggests that selecting and utilizing appropriate learning media plays an important role in supporting students' academic achievement.

The significance of learning media is crucial for effective knowledge transfer and student comprehension. It serves as a vital tool in conveying material, ensuring students grasp presented concepts, and adapting to diverse learning needs. Interactive learning media, in particular, plays a crucial role in enhancing student engagement and academic performance, creating dynamic and engaging learning environments.

Conversely, traditional teaching models, often characterized by lectures and rote memorization, have demonstrated limited effectiveness in fostering deep understanding and active participation. These conventional approaches can lead to student passivity, monotonous learning experiences, and difficulties in concept comprehension. The low understanding of concepts among students is often attributed to teacher-centered learning, which tends to make students passive. Therefore, the strategic incorporation of innovative learning media is essential to overcome these challenges and cultivate an environment conducive to active and engaging learning.

The use of learning media is very important to convey material to students and so that students can understand the material presented. Along with the times, learning media has also developed. With information and communication technology, many learning applications can be used. One of them is learning by utilizing features on the internet (Yulianti, 2023). Nearpod is identified as one of the website-based interactive media applications that allows teachers to create learning activities that actively involve students, both online and offline. The use of the 'Game Time to Climb' feature in Nearpod that integrates set material questions with competition elements can significantly increase student participation and understanding. Set material is one of the essential basic mathematics concepts at the junior high

school level, and mastery of this concept is fundamental for further mathematics learning (Smith, 2020; Rohmah et al., 2023). Through this gamification approach, students are not only motivated to actively participate, but also get a more fun and interactive learning experience, which in turn can deepen their understanding of the material being taught (Johnson & Lee, 2019; Sarji & Mampouw, 2022; Kosasih, Saputra, & Indriani, 2025).

In an ideal context, advances in information technology in the era of globalization are driving a fundamental transformation in the learning of mathematics in secondary schools (Lesmana & Afriansyah, 2024; Saputri & Sarumaha, 2025). Optimal utilization of technology should facilitate learning environments that are interactive, engaging, and significantly increase students' active participation in understanding essential mathematical concepts (Smith, 2023; Saputro et al., 2024). However, the reality in the field shows that learning is still dominated by conventional methods such as lectures and textbooks, which often cause students to be passive, monotonous learning, and lead to low interest in learning and difficulty understanding the material, as is the case with set material (Rahayu, Aima, & Juwita, 2023; Kurniawan et al., 2024). Although the potential of technology-based interactive learning media, especially platforms such as Nearpod with attractive features has been widely recognized to overcome these problems, there is a void or lack of Nearpod-based learning media development that is specifically designed, systematically developed (through the R&D approach), and tested for validity, practicality, and effectiveness for set materials in the context of the curriculum and student characteristics in Indonesia.

Nearpod is a free web-based platform that can be utilized in both online and offline learning environments, allowing educators and learners to interact either synchronously or asynchronously. This application is equipped with a variety of attractive features that foster interactive, dynamic, and effective learning experiences, as it helps to overcome the limitations of time and place that are often encountered in traditional classrooms. According to Delacruz, Nearpod is capable of creating a learning atmosphere that is not only enjoyable but also actively engages students in the process of knowledge construction. By incorporating Nearpod into the teaching and learning process, students are encouraged to participate more actively, develop a sense of enthusiasm, and experience greater joy in learning. In line with this, Rahayu, Anggrasari & Solikah (2022) emphasize that the use of Nearpod contributes to increased student motivation and engagement, making it a valuable tool for educators seeking to create meaningful and student-centered learning experiences.

The Nearpod application is highly accessible for both educators and students, as it can be easily used through smartphones or laptops by simply opening the application or website available on the Play Store or via Google. Despite this convenience, the level of awareness and utilization of Nearpod remains relatively low, particularly among educational

stakeholders who could benefit significantly from its features. Feri (2021), in his research, emphasized that the presence of interactive media such as Nearpod is urgently required to support the effectiveness of teaching and learning processes. Interactive platforms like this not only facilitate the delivery of instructional materials but also provide opportunities for teachers to create innovative and engaging lesson designs that align with students' learning interests and preferences. Findings from several studies have shown that Nearpod can serve as a valuable tool for teachers to make learning more attractive, interactive, and tailored to students' needs. Moreover, its functions are not limited solely to supporting classroom engagement; the application can also be extended to other aspects of education, such as enhancing learning outcomes, improving students' comprehension of the subject matter, and even serving as a medium for assessment and feedback. This highlights the broader potential of Nearpod as a multifaceted educational technology that contributes both to the process and results of learning.

Based on the background that has been described, this research was conducted to bridge the existing gap by developing and evaluating the feasibility of Nearpod-based interactive learning media, which is expected to be a practical solution to increase student engagement and understanding of the material provided.

## II. METHOD

This research employs the Research and Development (R&D) approach, utilizing the ADDIE development model. The ADDIE model is structured into five distinct phases (Safitri, N., & Zulaiha, S., 2023). The selection of the ADDIE model is based on its ease, simplicity, and suitability for the development of learning media in the current era, and has been proven valid and appropriate for this type of development research. This study focuses on creating interactive learning media using Nearpod, specifically designed for teaching set concepts.

The ADDIE model is structured into five distinct phases, shown in Figure 1.



Figure 1. Five Steps ADDIE

The analysis phase is the initial step in the ADDIE model. At this stage, educators or instructional designers identify learning needs, student characteristics, and desired goals. The analysis also includes mapping existing problems, required competencies, and available resources. The results of this phase form the basis for designing appropriate learning solutions.

The design phase focuses on systematic planning of learning. Activities at this stage include developing learning objectives, selecting appropriate strategies, methods, and media, and designing evaluation instruments. The design must be detailed

and measurable to serve as a guide for subsequent development stages.

The development stage is the process of turning a previously created design into a tangible product. For example, if digital learning media was planned during the design stage, then products such as e-books, videos, modules, or interactive applications are developed during this stage. The resulting product is then tested on a limited basis to ensure its suitability before wider use.

The implementation stage is the implementation of learning using the developed product. The teacher or facilitator uses media, strategies, and methods according to the design in the actual learning process. This stage also observes how students respond to the learning and the extent to which the media or strategies used are effective in helping achieve learning objectives.

The evaluation stage is carried out to assess the effectiveness and efficiency of the entire learning process. Evaluation is an important stage because the results can be used as a basis for continuous improvement in future learning development.

The research data were collected through validation questionnaire instruments (for media experts and material experts), practicality questionnaires (for student responses), and learning outcome tests (to measure the effectiveness of the media through the Time to Climb game). The collected data were then analyzed using quantitative descriptive analysis techniques, with the calculation of the percentage of feasibility (validity), the percentage of practicality, and the calculation of the N-

gain score to determine the level of media effectiveness. The validity criteria use a percentage scale (Very Valid to Invalid based on Arthawani, 2021), the practicality criteria also use a percentage (Very Practical to Not Practical based on Riduwan, 2015), while the effectiveness is measured from the N-gain value.

The collected data were analyzed using quantitative descriptive analysis techniques. Validity was calculated based on the percentage of assessments from subject matter experts and media experts. The validity criteria used a percentage scale (Very Valid to Not Valid) based on Arthawani (2021). The validation results from subject matter experts were 81.66% (Valid) and from media experts were 83.15% (Valid). Practicality was calculated from the percentage of responses to the teacher and student questionnaires. Practicality criteria also use a percentage scale (Very Practical to Not Practical) based on Riduwan (2015). The practicality score from the teacher questionnaire was 98.00% (Very Practical), and from the students was 87.63% (limited trial) and 85.21% (extensive trial), both categorized as Very Practical. Effectiveness was measured using the N-gain value to determine the level of improvement in students' understanding after using the media. The average N-gain score was 57.04 (Moderately Effective). Validators were mathematics education lecturers with doctoral degrees and backgrounds in educational technology, instructional design, or media development, while subject matter experts were academics or practitioners with in-depth understanding of mathematical concepts, particularly set

theory for seventh-grade students. Their expertise is crucial to ensure that the developed media are not only visually appealing and functional but also accurate in content and aligned with learning objectives. Based on the validation results, this media received a score of 82.92% from media experts and 84.77% from subject matter experts, both in the "Highly Valid" category, indicating that Nearpod media is theoretically suitable for use.

## III. RESULT AND DISCUSSION

The results of each stage of developing Nearpod-based interactive learning media on set material, in accordance with the ADDIE model.

At the analysis stage, researchers conducted curriculum analysis, analysis of student characteristics (who tend to be interested in smartphones and games so that they are often lack interested in learning), and media analysis (identifying the need for interesting and effective interactive media).

The Design stage produces a Nearpod media storyboard that includes the sequence of material, image/video placement, and interactive features such as the "Time to Climb Game".

At the development stage, the storyboard is realized into Nearpod media containing set material and questions, The Nearpod media underwent validation by both media and material experts. The validation results indicated a "Very Valid" category for the media, with a percentage of 82.92% from media experts and 84.77% from material experts. This suggests that the Nearpod media is theoretically viable for use.
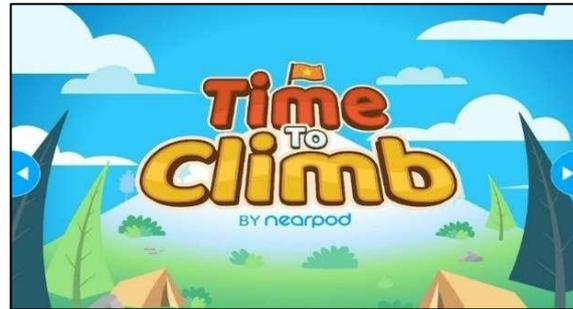


Figure 2. Main Page



Figure 3. Title Page



Figure 4. Problems Pages



Figure 5. Correct Answer Display

Figure 6. Wrong Answer Display



Figure 7. Score Ranking Display

At the implementation stage, Nearpod media was tested with seventh grade students to measure its practicality and effectiveness. The practicality trial on a large group of students resulted in a response percentage of 85.21%, categorized as "Very Practical", indicating that the media is easy to use and accepted by students. To measure effectiveness, the media was tested through the "Time to Climb Game" which involved students in answering questions about set material. The game result data was then analyzed using the N-gain score. The average percentage of the N-gain score was 57.04, with the category "Quite Effective". Further discussion reinforces that Nearpod media has succeeded in encouraging student learning activeness and motivation, which previously tended to be passive to be more enthusiastic and active in class. This finding is in line with previous research which states that Nearpod can increase students' learning activities and understanding due to its ability to attract attention. Thus, although its effectiveness is in the "Moderately Effective" category, Nearpod-based interactive learning media is proven to be able to help seventh grade students of MTs NU Miftahul Huda in understanding set material.

The evaluation stage is the last stage carried out as a student assessment in terms of the process and results that have been tested on students. The results in the form of student responses and scores obtained aim to determine the practicality and effectiveness of the nearpod learning media that has been developed by researchers.

This finding is in line with the research of Rohmah (2022) and Oktafiani & Mujazi (2022) which state that Nearpod can increase student learning activities because it attracts students' attention and focus, making it easier for students to understand the material. The increase in pre-test and post-test results also shows that Nearpod media helps students understand the material taught, in accordance with the results of the research. Thus, Nearpod-based learning media is considered quite effective in use by seventh grade students of MTs NU Miftahul Huda.

## IV. CONCLUSION

Nearpod-based interactive learning media for set material for seventh grade students has been successfully developed using the ADDIE development model. This research is motivated by the lack of learning media that causes students to have

difficulty understanding the concept of sets. The results showed that this Nearpod media is very valid based on the assessment of material experts (81.66%) and media experts (83.15%). In addition, this media proved to be very practical with a practicality value from the teacher questionnaire of 98.00% and from students of 87.63% (limited trial) and 85.21% (broad trial). However, the effectiveness of this media is in the "Moderately Effective" category with an average N-gain score of 57.04. The "Time to Climb Game" feature in Nearpod, which integrates set problems with competition elements, is considered capable of increasing student participation and understanding. This is in line with previous research which states that Nearpod can increase students' learning activities and understanding due to its attention-grabbing nature. Thus, this Nearpod-based learning media is proven to be able to help seventh grade students in understanding set material and encourage their learning activeness and motivation.

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