

**DEVELOPING MOBILE LEARNING MEDIA ON HUMAN
BONE SKELETON MATERIAL FOR GRADE 5
ELEMENTARY SCHOOL STUDENTS**

JURNAL SINTA 2



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**UNIVERSITAS ISLAM NEGERI
KIAI HAJI ACHMAD SIDDIQ JEMBER
FAKULTAS TARBIYAH DAN ILMU KEGURUAN
JURUSAN PENDIDIKAN ISLAM DAN BAHASA
PROGRAM STUDI PENDIDIKAN GURU MADRASAH IBTIDAIYAH
APRIL 2025**

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Kiai Haji Achmad Siddiq Jember
untuk memenuhi salah satu persyaratan
memperoleh gelar Sarjana Pendidikan (S.Pd)
Fakultas Tarbiyah dan Ilmu Keguruan
Jurusan Pendidikan Islam dan Bahasa
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LEMBAR PERSETUJUAN PEMBIMBING

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MOTTO

لَا يُكَلِّفُ اللَّهُ نَفْسًا إِلَّا وُسْعَهَا

Artinya: “ Allah tidak membenai seseorang mealainkan sesuai dengan kesanggupanya”*



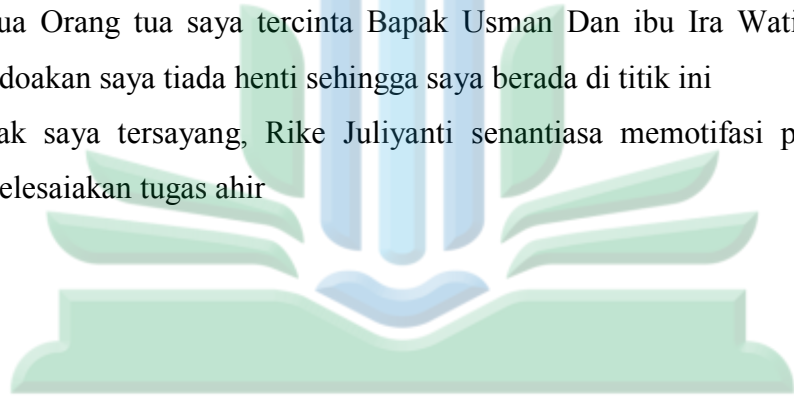
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PERSEMBAHAN

Puji syukur kehadiran Allah Subhanahu Wa Ta'ala yang telah memelimpahkan rahmat dan karunia-nya sehingga penulis dapat menyelesaikan tugas akhir dengan tepat waktu, karya tulis ini dipersembahkan kepada:

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2. Kakak saya tersayang, Rike Juliyanti senantiasa memotifasi penulis untuk menyelesaikan tugas ahir



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KATA PENGANTAR

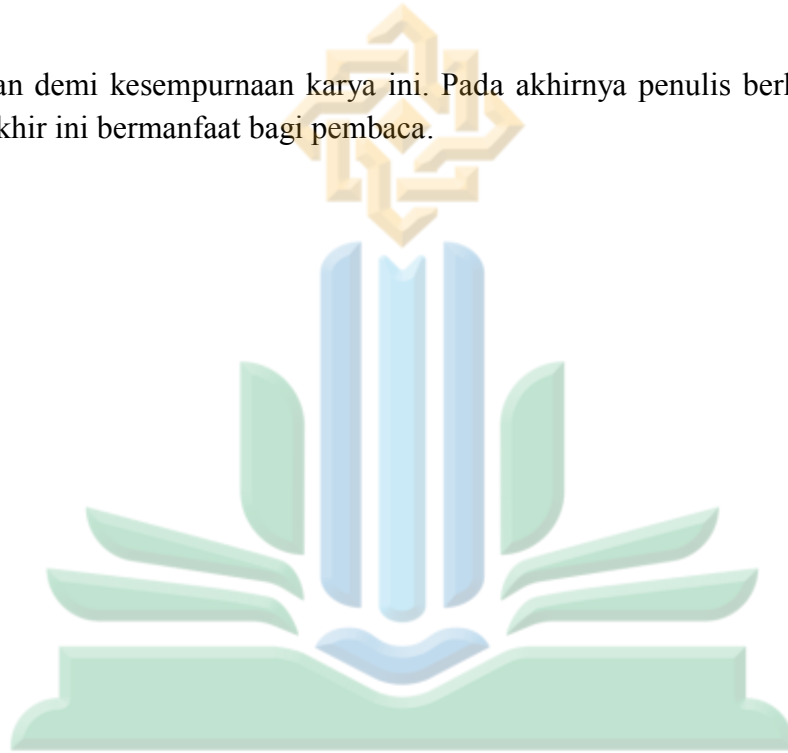
Segenap puji syukur penulis sampaikan kepada Allah SWT karena atas rahmat dan karunia-Nya, perencanaan, pelaksanaan dan penyelesaian tugas akhir sebagai salah satu syarat menyelesaikan program sarjana, dapat terselesaikan dengan lancar.

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J E M B E R



Developing Mobile Learning Media on Human Bone Skeleton Material for Grade 5 Elementary School Students

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Abstract

Research on the development of application products as learning media for elementary school students as learning media to increase the spirit of learning. This study aims to test the effectiveness of validity and evaluate applications as learning media. This research uses a development method with the ADDIE model, and the results of the observations show that some students experience problems when learning about the human skeleton. This study developed an application that contains material, questions, and scores at the design stage using Kilonotes and Smart Apps Creator. The results of the application media validity test obtained a score of 95% from media experts, assessing aspects of application display design, fonts, images, and practicality. The assessment given by the material expert was 90% based on the aspects of the material, questions, and practicality of learning. Assessment from students regarding application media as learning support is very helpful because the practical application is easy to use when learning outside and at school. Statistical tests show significant results; the value obtained is, on average, high. The results of data analysis of student responses to the media using the N-Gain Test formula show a positive start with a score of 96% of 30 students. It can be concluded that the use of the application as a learning media on grade 5 human skeleton material shows that this application is valid and feasible for use by students.

INTRODUCTION

Learning media are tools and materials teachers and students use in the teaching and learning process. Learning media stimulates students' mindsets to be more real to achieve learning objectives. (Pohan et al., 2022). According to Kemp and Dayton, the learning process will be more organized if learning media is used as a substitute when the



teacher cannot accompany students in class. Interestingly, learning materials are not only seen from the content but also from the way the teacher delivers media that attracts students' attention while in class (Andi Asari dan Sukmarman Purba, 2023).

Broadly speaking, learning media is a tool used by teachers to attract students' attention and stimulate students' mindsets in order to understand learning materials more deeply. This can be done in the form of various methods, such as the use of interactive media, discussions, and direct experiences that support the learning process effectively (Socrates & Mufit, 2022).

Based on the preoperation conducted by the researcher, it was found that there was a lack of variety in the learning media used by educators, especially in class V in the IPAS subject of human bone skeleton material. The media used is only in the form of pictures of the human skeleton, resulting in students having difficulty understanding the learning material, and some students feel bored.

Judging from the aspect of assessing student learning outcomes through worksheets, students do not understand the material conveyed. Besides students' lack of monitoring from parents regarding learning outcomes at school, data information was obtained by the author through the observation of Mrs. Eni Azizah, the 5th-grade teacher of SDN 02 Balung Jember. With these problems, the researcher has an innovation to develop image learning media to be more interesting in the form of applications in order to improve student learning outcomes.

During the observation, the researcher found a problem: students felt bored while learning because the media used were pictures. Therefore, the importance of application development in elementary schools is very helpful for students in learning in an easier and more fun way; of course, the application can be used anytime, anywhere. In addition, this research and development can increase students' interest in learning because this application is designed with an attractive and interactive display. There are material features and questions along with the scores obtained.

Although students do not always rely on apps, their use can help them understand the material more easily. Learning apps can present difficult concepts through clear images; thus, although not the only way of learning, apps serve as an additional tool that enriches the learning experience and increases student interest. The characteristics of this learning app are interactive features, attractive images, and ease of navigation so that the material is presented systematically and enjoyably (Kaharuddin et al., 2023). Meanwhile, the characteristics of the targeted students are generally able to learn independently, are more responsive to visual and interactive methods, and quickly adapt to technology (Erdawati & Sartika, 2022).

The human body reality application covers the material of the human bone skeleton. Bones are living tissues that can change from childhood to adolescence to adulthood. The human body reality application covers the material and presents images and other interesting features, such as question material and various supporting colors.

Research conducted by Prasetyo with the title Development of Augmented Reality Applications as Android-Based Human Body Anatomy Learning Media succeeded in increasing interest in studying the anatomical organ structure of the human body by presenting an interesting and interactive learning experience (Prasetyo et al., 2024).

The pre-research observations revealed a significant gap in the variety and effectiveness of learning media educators use, particularly in teaching the human skeletal system material in the fifth-grade IPAS (Natural and Social Sciences) subject. Currently, the media employed is limited to static images of the human skeleton, which fails to engage students or facilitate a deeper understanding of the material. This limitation has led to two critical issues: (1) students struggling to comprehend the complex structure and functions of the human skeletal system and (2) a lack of student engagement, resulting in boredom and reduced interest in the subject.

This study addresses this gap by introducing an innovative learning tool that leverages augmented reality (AR) technology to create an interactive and immersive learning experience. By transforming static images into dynamic, three-dimensional models, the developed media enhances students' understanding of the material and increases their engagement and motivation to learn. The research fills a critical void in the literature by demonstrating how AR-based learning media can overcome the limitations of traditional teaching methods, particularly in elementary science education. Furthermore, it provides empirical evidence supporting the integration of technology into the curriculum to improve both learning outcomes and student interest, offering a novel solution to a longstanding educational challenge.

Based on the research problems above, researchers developed media in the form of Human Body Reality Applications that can facilitate the learning process, using the human skeleton material to improve student learning outcomes. (Alvendri et al., 2023). The existence of application media can help students learn at school and home because the designed application can be accessed anywhere and anytime (Kaharuddin et al., 2023).

METHODS

This research uses the research and development method to create new products. (Septiani & Setiawan, 2024) and testing the effectiveness of the product to be used by students in learning (Lutfina et al., 2023). This research uses the ADDIE model, which consists of analysis, design, development, implementation, and evaluation in order to produce effective products (Siswo Handoyo & Suhardianto Suhardianto, 2021).

The stages of the ADDIE Research and Development model are based on the philosophy of education. The application of this model must be student-centered, innovative, authentic, and inspiring. The stages of implementing the ADDIE model have a mutually supportive relationship; the stages of the model are described as follows (Waruwu, 2024).

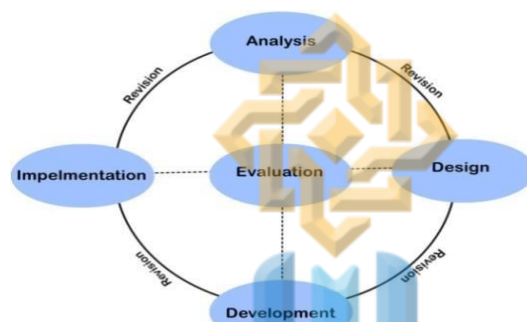


Figure 1. Research And Development Methodos Sour:
Robert Merbie Branch

1. Analyze the needs of students and teachers to determine learning media that suits their needs in order to improve learning outcomes.
2. Designing products according to student needs, such as designing learning media that are attractive, energy-efficient, affordable, and useful long-term, such as learning media using application technology.
3. Developing learning media through the process of creating media, as well as conducting validity tests by experts.
4. Implementation of the media application process in the field.
5. Product evaluation is used to assess the effectiveness of the media to find out the strengths and weaknesses of the media and how it can affect students' understanding.

The development that will be carried out following the procedure aims to achieve effective and efficient results consisting of five steps, namely performance analysis, design, development, and evaluation, which are needed to develop from making to reviewing media improvements (Lyanda et al., 2023).

In development research to measure the effectiveness of the media, researchers use a Liker scale; the answers to each instrument have positive and negative values (Kuntoro & Fajrie, 2023). The measurement results using the Likert scale help to evaluate the effectiveness of the media that will be developed so that the media is more suitable for use during learning.

Learning effectiveness is measured using the N-Gain test to improve student learning outcomes (Shella Zuliana et al., 2023). Comparing pre-test and post-test scores provides a solid foundation for evaluating the extent to which learning contributes to understanding. (Langi et al., 2022). The N-Gain test formula is used to calculate the score obtained; the calculation results are categorized into three parts: low, medium, and high. This aims to distinguish that the learning method effectively improves students' understanding and skills. (Masliah et al., 2023).

Student response using a questionnaire sheet to assess the attractiveness and feasibility of learning media for human body reality applications in IPAS subjects (Miralda & Marhaeni, 2023). Measurement of assessment using a Liker scale, students can fill in answers with information strongly agree (SS), agree (S), moderately agree (CS), disagree (TS), and strongly disagree (STS) with the formula (Kuntoro & Fajrie, 2023).

$$V = \frac{\sum X}{N \times 1000\%}$$

Description:

$$V = \text{Value}$$

$\sum X$ = Score obtained Maximum score

$$V = \frac{\text{average number}}{\text{maximum score} \times 100\%}$$

Analysis of effectiveness using the N-Gain test obtained through pre-test and post-test to determine high and low N-Gain using the following formula (Ananda et al., 2023).

$$N - \text{Gain} = \frac{\text{Skor post test} - \text{Skor Presentase}}{\text{Ideal score (100)} - \text{Skor Presentase}}$$

Table 1. Normalization criteria score

N-Gain Score	N-Gain Normalization Criteria
$0,00 \leq \text{N-Gain} \leq 0,30$	Low
$0,30 \leq \text{N-Gain} \leq 0,70$	Medium
$\text{N-Gain} \geq 0,70$	High

Sumber: Muhammad Andijafir (2023)

The interpretation of normalized scores to determine the value of effectiveness (Mea et al., 2024) By comparing the improvement from pre-test to post-test results, the N-Gain interpretation focuses on measures to be more efficient in improving learning (Meduri et al., 2022).

Table 2. Interpretation of the effectiveness of media use

Presentation	N-Gain Percentage Criteria
≤ 40	Not Effective
40-50	Less Effective
65-75	Effective
≥ 76	Highly Effective

Source : Triwulandari, Adam Muhdinillah (2022)

RESULTS

1. Analysis

At this stage, the researcher analyzes the needs of students in order to achieve learning outcomes; the factors that hinder learning are the lack of variations in learning media. The continuous use of image media without any variation can make students feel bored, reducing student learning outcomes due to the lack of attractiveness used. The results of the analysis show that students need media to improve learning outcomes. Using technology, researchers create media in the form of applications. The purpose of digital media needs to be applied in schools to keep up with the times. Without special media, students get bored and lack enthusiasm, especially in understanding learning. The use of technology is expected to increase student learning enthusiasm.

2. Design

At the design stage, researchers design sketches of the human skeleton, determine colors, present material and questions in games, and add supporting features. The following researchers explain in detail the design of the human body reality application.

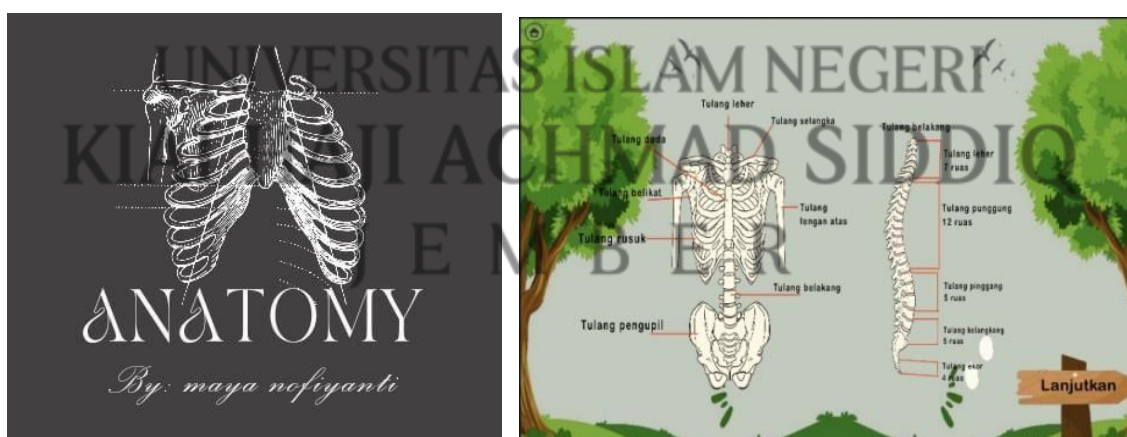


Figure 2. Learning Media View

The background design reflects the theme that will be studied overall in the learning application, can attract students' attention, provide user comfort, and support the spirit of fun learning (Irawan & Rosyani, 2022).



Figure 3. Display of Quiz and Score Page

The initial display contains learning materials that discuss the human skeleton and its parts so that students can understand the topics to be learned. Learning materials that are designed according to student learning needs also support the achievement of goals when learning so that it becomes effective.

The material about the human skeleton is not only a description of the explanation, but this application also displays visuals of the human skeleton and its parts (Akbar et al., 2024). With this feature, students can see in detail and facilitate understanding of the structure and names of bones. This application is equipped with practice questions to test students' understanding of the human skeleton (Nurhayati et al., 2022).

The learning application has question granules along with the student's learning outcomes score. In this display, if the student answers the question correctly, they will get 10 points. If the student answers the wrong question, they will automatically move to the next question (Nurhayati et al., 2022). This feature helps students to evaluate the level of understanding to improve their understanding of the material that has been learned (Al-Khassawneh, 2023).

After students learn and answer questions, there will be a score of student learning results. The assessment functions as evaluating and supporting the teaching and learning process (Sutarso et al., 2023). The purpose of learning scores is to be structured and directed to achieve maximum results (Cadiz et al., 2024).

3. Development

Creating an application in the form of human body reality that can be downloaded and accessed offline, researchers conducted validity tests by experts in the development stage. Both material experts, media experts, and linguists. Based on the findings of data analysis results from 4 validators of material, language, material, and media, it shows that the learning media meets the valid category and is suitable for use (Fadli et al., 2023).

Table 3. Validation of product eligibility criteria

NO	Aspects Assessed	Total Indicators	Score
1.	Media by student needs	5	5,5,4,5,5
2.	Material by learning objectives	4	5,5,5,5
3.	The language used is easy to understand	6	4,5,5,5,5,4
4.	Media makes learning easier for students and teachers	5	5,4,5,5,5
Total		20	96
Maximum score			80
Presentation			96%

According to data gathered from a panel of experts, 93.3% of material experts, 94% of linguists, and 96.6% of learning validators categorized the teaching application as valid, achieving an overall validity percentage of 96%. The application was tested with students to assess its effectiveness. During this implementation phase, researchers received valuable feedback and suggestions for improving the media.

Media experts recommended adding intonation features to the questions answered by students. Additionally, material experts suggested linking the learning content to daily activities, such as demonstrating the movement of the jaw when chewing while eating. Based on this feedback, the researchers made revisions to the media and subsequently tested the updated version with students.

4. Implementation

Experts have deemed the application of human-body reality media feasible for use in fifth-grade classrooms. This application is conducted in two stages. The first stage involves a small-scale implementation with 10 students, followed by a process to gather feedback from both students and teachers. If the responses from both groups are positive, the project will progress to the second stage, which includes a large-scale trial involving 30 students. Both small and large-scale applications will include pre-test and post-test activities. The results from these trials indicate that there was a noticeable improvement in understanding before and after using the media.

CONCLUSION

The research findings demonstrate that the developed learning media is highly feasible and effective for use in elementary school science education. Validation results from material experts (94%), media experts (93.3%), and linguists (96.6%) yielded an overall average score of 94.7%, categorizing the media as **very feasible**. Additionally, the effectiveness of the media was confirmed through pre-test and post-test assessments, which revealed significant improvements in student learning outcomes, with all students achieving the Minimum Mastery Criteria (KKM) after its implementation.

This study highlights the potential of integrating augmented reality (AR) technology into educational tools to create interactive and immersive learning experiences. The positive feedback from experts and students underscores its ability to enhance engagement and understanding, particularly for complex scientific concepts like the human skeletal system. The results suggest that AR-based learning media can serve as a valuable alternative to traditional teaching

methods, addressing challenges in science education. Furthermore, this research contributes to the broader discourse on the use of technology in education, providing a foundation for future exploration of AR applications across different subjects and educational levels. Its novelty lies in its successful adaptation of AR for elementary-level science education, offering a practical and innovative solution to improve learning outcomes.

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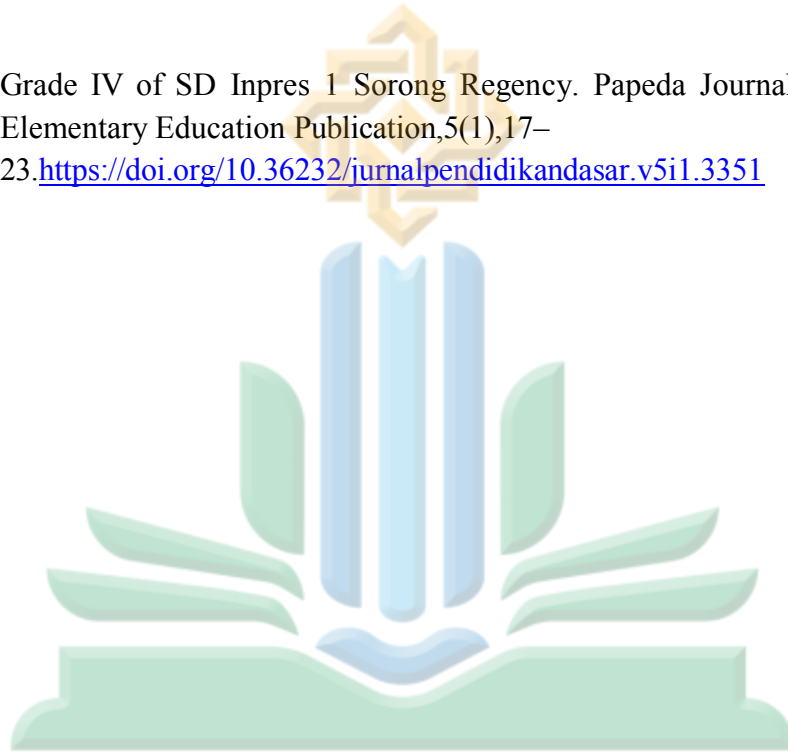
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UNIVERSITAS ISLAM NEGERI
KIAI HAJI ACHMAD SIDDIQ
J E M B E R



Pengembangan Media Pembelajaran Mobile Learning pada Materi Rangka Tulang Manusia untuk Siswa Kelas 5 Sekolah Dasar

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Abstrak

Penelitian tentang pengembangan produk aplikasi sebagai media pembelajaran untuk siswa sekolah dasar sebagai media pembelajaran untuk meningkatkan semangat belajar. Penelitian ini bertujuan untuk menguji keefektifan validitas dan mengevaluasi aplikasi sebagai media pembelajaran. Penelitian ini menggunakan metode pengembangan dengan model ADDIE, dan hasil observasi menunjukkan bahwa beberapa siswa mengalami masalah saat belajar tentang kerangka manusia. Penelitian ini mengembangkan aplikasi yang berisi materi, soal, dan nilai pada tahap desain menggunakan Kilonotes dan Smart Apps Creator. Hasil uji validitas media aplikasi memperoleh nilai 95% dari ahli media, dengan menilai aspek desain tampilan aplikasi, font, gambar, dan kepraktisan. Penilaian yang diberikan oleh ahli materi sebesar 90% berdasarkan aspek materi, soal, dan kepraktisan pembelajaran. Penilaian dari siswa mengenai media aplikasi sebagai penunjang pembelajaran sangat membantu karena aplikasi praktikum mudah digunakan saat belajar di luar maupun di sekolah. Uji statistik menunjukkan hasil yang signifikan, nilai yang diperoleh rata-rata tinggi. Hasil analisis data respon siswa terhadap media dengan menggunakan rumus N-Gain Test menunjukkan awal yang positif dengan nilai 96% dari 30 siswa. Dapat disimpulkan bahwa penggunaan aplikasi sebagai media pembelajaran pada materi rangka manusia kelas 5 SD menunjukkan bahwa aplikasi ini valid dan layak digunakan oleh siswa.

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PENDAHULUAN

Media pembelajaran adalah alat dan bahan yang digunakan guru dan siswa dalam proses belajar mengajar. Media pembelajaran merangsang pola pikir siswa menjadi lebih nyata untuk mencapai tujuan pembelajaran. (Pohan et al., 2022). Menurut Kemp dan Dayton, proses pembelajaran akan lebih terorganisir jika media pembelajaran digunakan sebagai pengganti ketika guru tidak dapat mendampingi siswa di kelas. Menariknya, materi pembelajaran tidak hanya dilihat dari isinya saja, tetapi juga dari cara guru menyampaikan media yang menarik perhatian siswa saat berada di kelas (Andi Asari dan Sukmarman Purba, 2023).

Secara garis besar, media pembelajaran merupakan alat bantu yang digunakan oleh guru untuk menarik perhatian siswa dan merangsang pola pikir siswa agar dapat memahami materi pembelajaran secara lebih mendalam. Hal ini dapat dilakukan dalam bentuk berbagai macam cara, seperti penggunaan media interaktif, diskusi, dan pengalaman langsung yang mendukung proses pembelajaran secara efektif (Socrates & Mufit, 2022).

Berdasarkan pra observasi yang dilakukan oleh peneliti, ditemukan kurangnya variasi media pembelajaran yang digunakan oleh pendidik khususnya di kelas V pada mata pelajaran IPA materi kerangka tulang manusia. Media yang digunakan hanya berupa gambar-gambar rangka manusia, sehingga mengakibatkan peserta didik mengalami kesulitan dalam memahami materi pembelajaran, dan sebagian peserta didik merasa bosan.

Dilihat dari aspek penilaian hasil belajar siswa melalui LKS, siswa kurang memahami materi yang disampaikan. Selain itu kurangnya pemantauan siswa dari orang tua terkait hasil belajar di sekolah, informasi data diperoleh penulis melalui pengamatan Ibu Eni Azizah, guru kelas 5 SDN 02 Balung Jember. Dengan adanya permasalahan tersebut, peneliti memiliki inovasi untuk mengembangkan media pembelajaran gambar menjadi lebih menarik dalam bentuk aplikasi agar dapat meningkatkan hasil belajar siswa.

Selama observasi, peneliti menemukan masalah yaitu siswa merasa bosan saat belajar karena media yang digunakan adalah gambar. Oleh karena itu. Pentingnya pengembangan aplikasi di sekolah dasar sangat membantu siswa dalam belajar dengan cara yang lebih mudah dan menyenangkan, tentunya aplikasi tersebut dapat digunakan kapanpun dan dimanapun. Selain itu, penelitian dan pengembangan ini dapat meningkatkan minat belajar siswa karena aplikasi ini didesain dengan tampilan yang menarik dan interaktif. Terdapat fitur materi dan soal-soal beserta nilai yang diperoleh.

Meskipun siswa tidak selalu bergantung pada aplikasi, penggunaannya dapat membantu mereka memahami materi dengan lebih mudah. Aplikasi pembelajaran dapat menyajikan konsep-konsep yang sulit melalui gambar yang jelas; dengan demikian, meskipun bukan satu-satunya cara belajar, aplikasi berfungsi sebagai alat tambahan yang memperkaya pengalaman belajar dan meningkatkan minat siswa. Karakteristik dari aplikasi pembelajaran ini adalah fitur interaktif, gambar yang menarik, dan kemudahan navigasi sehingga materi disajikan secara sistematis dan menyenangkan (Kaharuddin et al., 2023). Sementara itu, karakteristik siswa yang menjadi sasaran umumnya mampu belajar secara mandiri, lebih responsif terhadap

metode visual dan interaktif, serta cepat beradaptasi dengan teknologi (Erdawati & Sartika, 2022).

Aplikasi realitas tubuh manusia mencakup materi kerangka tulang manusia. Tulang adalah jaringan hidup yang dapat berubah dari masa kanak-kanak, remaja, hingga dewasa. Aplikasi realitas tubuh manusia mencakup materi tersebut dan menyajikan gambar serta fitur menarik lainnya, seperti materi soal dan berbagai warna yang mendukung.

Penelitian yang dilakukan oleh Prasetyo dengan judul Pengembangan Aplikasi Augmented Reality Sebagai Media Pembelajaran Anatomi Tubuh Manusia Berbasis Android berhasil meningkatkan minat untuk mempelajari struktur organ anatomi tubuh manusia dengan menyajikan pengalaman belajar yang menarik dan interaktif (Prasetyo dkk, 2024).

Pengamatan pra-penelitian menunjukkan adanya kesenjangan yang signifikan dalam variasi dan efektivitas media pembelajaran yang digunakan oleh para pendidik, khususnya dalam mengajarkan materi sistem rangka manusia di kelas lima mata pelajaran IPAS (Ilmu Pengetahuan Alam dan Sosial). Saat ini, media yang digunakan terbatas pada gambar statis dari kerangka manusia, yang gagal melibatkan siswa atau memfasilitasi pemahaman yang lebih dalam tentang materi tersebut. Keterbatasan ini telah menyebabkan dua masalah kritis: (1) siswa berjuang untuk memahami struktur dan fungsi sistem rangka manusia yang kompleks dan (2) kurangnya keterlibatan siswa, yang mengakibatkan kebosanan dan berkurangnya minat terhadap mata pelajaran.

Penelitian ini membahas kesenjangan ini dengan memperkenalkan alat pembelajaran inovatif yang memanfaatkan teknologi augmented reality (AR) untuk menciptakan pengalaman belajar yang interaktif dan imersif. Dengan mengubah gambar statis menjadi model tiga dimensi yang dinamis, media yang dikembangkan meningkatkan pemahaman siswa terhadap materi dan meningkatkan keterlibatan serta motivasi mereka untuk belajar. Penelitian ini mengisi kekosongan kritis dalam literatur dengan menunjukkan bagaimana media pembelajaran berbasis AR dapat mengatasi keterbatasan metode pengajaran tradisional, khususnya dalam pendidikan sains dasar. Selain itu, penelitian ini memberikan bukti empiris yang mendukung integrasi teknologi ke dalam kurikulum untuk meningkatkan hasil belajar dan minat siswa, menawarkan solusi baru untuk tantangan pendidikan yang telah lama ada.

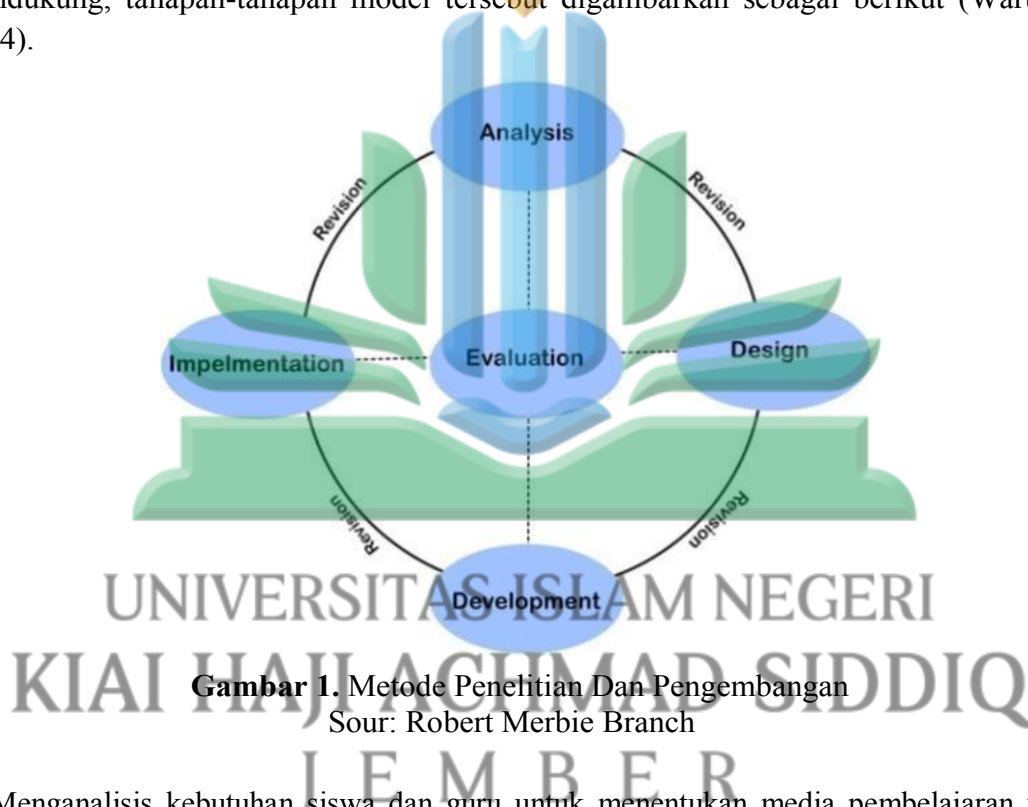
Berdasarkan permasalahan penelitian di atas, peneliti mengembangkan media berupa Aplikasi Realitas Tubuh Manusia yang dapat mempermudah proses pembelajaran, dengan menggunakan materi kerangka manusia untuk meningkatkan hasil belajar siswa. (Alvendri et al., 2023). Adanya media aplikasi dapat membantu siswa belajar di sekolah maupun di rumah karena aplikasi yang dirancang dapat diakses dimanapun dan kapanpun (Kaharuddin et al., 2023).

METODE

Penelitian ini menggunakan metode penelitian dan pengembangan untuk menciptakan produk baru. (Septiani & Setiawan, 2024) dan menguji keefektifan produk tersebut untuk digunakan siswa dalam pembelajaran (Lutfina et al., 2023). Penelitian ini menggunakan model ADDIE, yang terdiri dari analisis, desain, pengembangan,

implementasi, dan evaluasi untuk menghasilkan produk yang efektif (Siswo Handoyo & Suhardianto, 2021).

Tahapan model Penelitian dan Pengembangan ADDIE didasarkan pada filosofi pendidikan. Penerapan model ini harus berpusat pada siswa, inovatif, otentik, dan inspiratif. Tahapan-tahapan penerapan model ADDIE memiliki hubungan yang saling mendukung, tahapan-tahapan model tersebut digambarkan sebagai berikut (Waruwu, 2024).



Gambar 1. Metode Penelitian Dan Pengembangan
Sour: Robert Merbie Branch

1. Menganalisis kebutuhan siswa dan guru untuk menentukan media pembelajaran yang sesuai dengan kebutuhan mereka dalam rangka meningkatkan hasil belajar.
2. Merancang produk sesuai kebutuhan mahasiswa, seperti merancang media pembelajaran yang menarik, hemat energi, terjangkau, dan bermanfaat dalam jangka panjang, seperti media pembelajaran dengan menggunakan teknologi aplikasi.
3. Mengembangkan media pembelajaran melalui proses pembuatan media, serta melakukan uji validitas oleh para ahli.
4. Implementasi proses aplikasi media di lapangan.
5. Evaluasi produk digunakan untuk menilai keefektifan media untuk mengetahui kelebihan dan kekurangan media dan bagaimana media tersebut dapat mempengaruhi pemahaman siswa.

Pengembangan yang akan dilakukan mengikuti prosedur yang bertujuan untuk mencapai hasil yang efektif dan efisien yang terdiri dari lima langkah, yaitu analisis kinerja, desain, pengembangan, dan evaluasi, yang diperlukan untuk mengembangkan mulai dari membuat hingga meninjau perbaikan media (Lyanda et al., 2023).

Dalam penelitian pengembangan untuk mengukur keefektifan media, peneliti menggunakan skala Likert yang jawaban dari setiap instrumennya memiliki nilai positif dan negatif (Kuntoro & Fajrie, 2023). Hasil pengukuran menggunakan skala Likert membantu untuk mengevaluasi keefektifan media yang akan dikembangkan sehingga media lebih layak digunakan saat pembelajaran.

Efektivitas pembelajaran diukur dengan menggunakan uji N-Gain untuk meningkatkan hasil belajar siswa (Shella Zuliana et al., 2023). Membandingkan nilai pre-test dan post-test memberikan dasar yang kuat untuk mengevaluasi sejauh mana pembelajaran berkontribusi terhadap pemahaman. (Langi et al., 2022). Rumus uji N-Gain digunakan untuk menghitung skor diperoleh; hasil perhitungan dikategorikan menjadi tiga bagian: rendah, sedang, dan tinggi. Hal ini bertujuan untuk membedakan bahwa metode pembelajaran tersebut efektif meningkatkan pemahaman dan keterampilan siswa. (Masliah et al., 2023).

Respon siswa menggunakan lembar kuesioner untuk menilai kemenarikan dan kelayakan media pembelajaran aplikasi realitas tubuh manusia pada mata pelajaran IPAS (Miralda & Marhaeni, 2023). Pengukuran penilaian menggunakan skala liker, mahasiswa dapat mengisi jawaban dengan keterangan sangat setuju (SS), setuju (S), cukup setuju (CS), tidak setuju (TS), dan sangat tidak setuju (STS) dengan rumus (Kuntoro & Fajrie, 2023).

$$V = \frac{\sum X}{N \times 100\%}$$

Deskripsi:

V = Nilai

$\sum X$ = Skor yang

diperoleh N = Skor maksimum

Jumlah rata-rata skor

$$V = \frac{\text{maksimum Score } 100\%}{\text{maksimum Score } 100\%}$$

Analisis keefektifan menggunakan uji N-Gain yang diperoleh melalui pre-test dan post-test untuk menentukan tinggi rendahnya N-Gain dengan menggunakan rumus sebagai berikut (Ananda et al., 2023).

Skor post test – Skor Presentase

$$N - Gain = \frac{\text{Skor post test} - \text{Skor Presentase}}{\text{Ideal score (100)} - \text{Skor Presentase}}$$

Tabel 1. Skor kriteria normalisasi

Skor N-Gain	Kriteria Normalisasi N-Gain
$0,00 \leq \text{N-Gain} \leq 0,30$	Rendah
$0,30 \leq \text{N-Gain} \leq 0,70$	Sedang
$\text{N-Gain} \geq 0,70$	Tinggi

Sumber: Muhammad Andijafir (2023)

Interpretasi skor yang dinormalisasi untuk menentukan nilai efektivitas (Mea et al., 2024) Dengan membandingkan peningkatan dari hasil pre-test ke post-test, interpretasi N-Gain berfokus pada langkah-langkah untuk menjadi lebih efisien dalam meningkatkan pembelajaran (Meduri et al., 2022).

Tabel 2. Interpretasi efektivitas penggunaan media

Presentasi	Kriteria Persentase N-Gain
≤ 40	Tidak Efektif
40-50	Kurang Efektif
65-75	Efektif
≥ 76	Sangat Efektif

Sumber : Triwulandari, Adam Muhdinillah (2022)

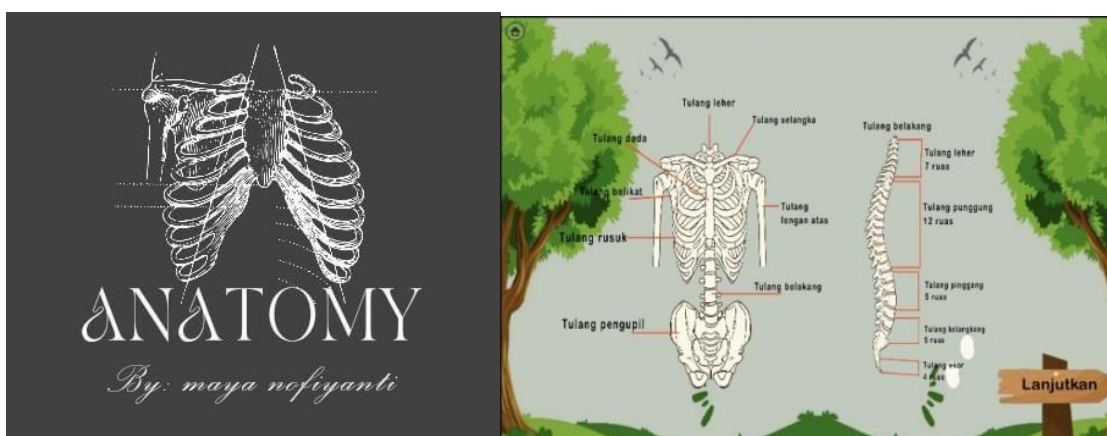
HASIL

1. Analisis

Pada tahap ini, peneliti menganalisis kebutuhan siswa untuk mencapai tujuan pembelajaran, faktor yang menghambat pembelajaran adalah kurangnya variasi media pembelajaran. Penggunaan media gambar secara terus menerus tanpa adanya variasi dapat membuat siswa merasa bosan sehingga menurunkan hasil belajar siswa karena kurangnya daya tarik yang digunakan. Hasil analisis menunjukkan bahwa siswa membutuhkan media untuk meningkatkan hasil belajar. Dengan memanfaatkan teknologi, peneliti membuat media berupa aplikasi. Tujuan media digital perlu diterapkan di sekolah untuk mengikuti perkembangan zaman. Tanpa adanya media khusus, siswa menjadi bosan dan kurang semangat terutama dalam memahami pembelajaran. Penggunaan teknologi diharapkan dapat meningkatkan semangat belajar siswa.

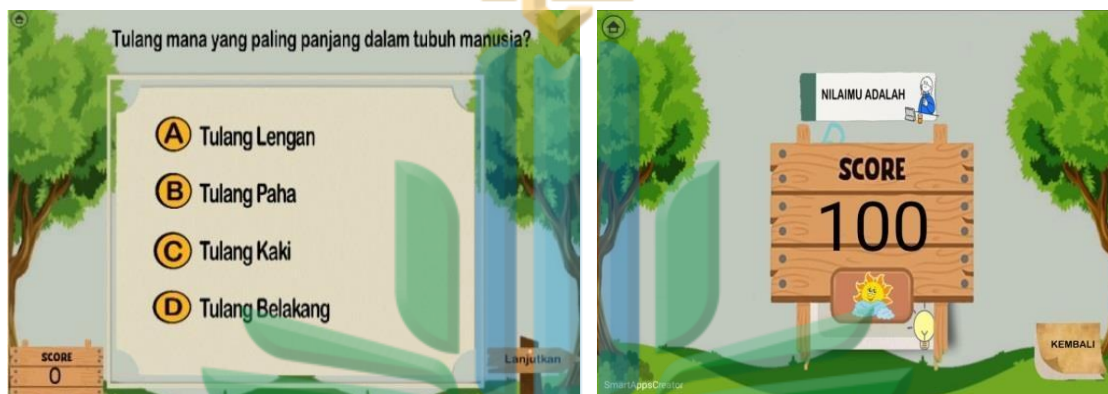
2. Desain

Pada tahap desain, peneliti merancang sketsa kerangka manusia, menentukan warna, menyajikan materi dan pertanyaan dalam game, serta menambahkan fitur-fitur pendukung. Berikut peneliti jelaskan secara rinci perancangan aplikasi realitas tubuh manusia.



Gambar 2. Tampilan Media Pembelajaran Tampilan Media Pembelajaran

Desain latar belakang mencerminkan tema yang akan dipelajari secara keseluruhan pada aplikasi pembelajaran, dapat menarik perhatian siswa, memberikan kenyamanan pengguna, dan mendukung semangat belajar yang menyenangkan



Gambar 3. Tampilan Halaman Kuis Tampilan Halaman Kuis dan Skor

Tampilan awal berisi materi pembelajaran yang membahas tentang kerangka manusia dan bagian-bagiannya sehingga siswa dapat memahami topik yang akan dipelajari. Materi pembelajaran yang dirancang sesuai dengan kebutuhan belajar siswa juga mendukung tercapainya tujuan saat pembelajaran sehingga menjadi efektif.

Materi mengenai kerangka manusia tidak hanya berupa uraian penjelasan, tetapi aplikasi ini juga menampilkan visual kerangka manusia dan bagian-bagiannya (Akbar et al., 2024). Dengan adanya fitur ini, siswa dapat melihat secara detail dan memudahkan pemahaman mengenai struktur dan nama-nama tulang. Aplikasi ini dilengkapi dengan latihan soal untuk menguji pemahaman siswa mengenai rangka manusia (Nurhayati et al., 2022).

Aplikasi pembelajaran memiliki butiran soal beserta skor hasil belajar siswa. Pada tampilan ini, jika siswa menjawab pertanyaan dengan benar, mereka akan mendapatkan 10 poin. Jika siswa menjawab pertanyaan yang salah, maka secara otomatis akan berpindah ke pertanyaan berikutnya (Nurhayati et al., 2022). Fitur ini

membantu siswa untuk mengevaluasi tingkat pemahaman untuk meningkatkan pemahaman mereka terhadap materi yang telah dipelajari (Al-Khassawneh, 2023).

Setelah siswa belajar dan menjawab pertanyaan, maka akan ada nilai hasil belajar siswa. Penilaian tersebut berfungsi sebagai evaluasi dan pendukung proses belajar mengajar (Sutarso et al., 2023). Tujuan dari nilai pembelajaran adalah agar terstruktur dan terarah untuk mencapai hasil yang maksimal (Cadiz et al., 2024).

3. Pengembangan

Menciptakan sebuah aplikasi berupa realitas tubuh manusia yang dapat diunduh dan diakses secara offline, peneliti melakukan uji validitas oleh para ahli pada tahap pengembangan. Baik ahli materi, ahli media, maupun ahli bahasa. Berdasarkan temuan hasil analisis data dari 4 validator materi, bahasa, materi, dan media menunjukkan bahwa media pembelajaran tersebut memenuhi kategori valid dan layak untuk digunakan (Fadli et al., 2023).

Tabel 3. Validasi kriteria kelayakan produk Validasi kriteria kelayakan produk

TIDAK	Aspek yang Dinilai	Total Indikator	Skor
1.	Media berdasarkan kebutuhan siswa	5	5,5,4,5,5
2.	Materi berdasarkan tujuan pembelajaran	4	5,5,5,5
3.	Bahasa yang digunakan mudah dimengerti	6	4,5,5,5,4
4.	Media membuat pembelajaran lebih mudah bagi siswa dan guru	5	5,4,5,5,5
Total		20	96
Skor maksimum			80
Presentasi			96%

Menurut data yang dikumpulkan dari panel ahli, 93,3% ahli materi, 94% ahli bahasa, dan 96,6% validator pembelajaran mengkategorikan aplikasi pembelajaran ini sebagai valid, mencapai persentase validitas keseluruhan sebesar 96%. Aplikasi ini diuji coba dengan siswa untuk menilai efektivitasnya. Selama tahap implementasi ini, para peneliti menerima umpan balik dan saran yang berharga untuk meningkatkan media.

Ahli media menyarankan untuk menambahkan fitur intonasi pada pertanyaan yang dijawab oleh siswa. Selain itu, ahli materi menyarankan untuk mengaitkan materi pembelajaran dengan kegiatan sehari-hari, seperti mendemonstrasikan gerakan rahang saat mengunyah saat makan. Berdasarkan masukan tersebut, para peneliti melakukan revisi terhadap media dan kemudian mengujicobakan versi yang telah direvisi kepada siswa.

4. Implementasi

Para ahli telah menganggap penerapan media realitas tubuh manusia layak untuk digunakan di ruang kelas lima. Penerapan ini dilakukan dalam dua tahap. Tahap pertama melibatkan implementasi skala kecil dengan 10 siswa, diikuti dengan proses untuk mengumpulkan umpan balik dari siswa dan guru. Jika tanggapan dari kedua kelompok tersebut positif, proyek ini akan berlanjut ke tahap kedua, yang mencakup uji coba skala besar yang melibatkan 30 siswa. Baik aplikasi skala kecil maupun skala besar akan mencakup kegiatan pre-test dan post-test. Hasil dari uji coba ini menunjukkan bahwa ada peningkatan yang nyata dalam pemahaman sebelum dan sesudah menggunakan media.

KESIMPULAN

Temuan penelitian menunjukkan bahwa media pembelajaran yang dikembangkan sangat layak dan efektif untuk digunakan dalam pembelajaran IPA di sekolah dasar. Hasil validasi dari ahli materi (94%), ahli media (93,3%), dan ahli bahasa (96,6%) menghasilkan nilai rata-rata keseluruhan 94,7%, yang mengkategorikan media sebagai sangat layak. Selain itu, keefektifan media dikonfirmasi melalui penilaian pre-test dan post-test, yang menunjukkan peningkatan yang signifikan dalam hasil belajar siswa, dengan semua siswa mencapai Kriteria Ketuntasan Minimal (KKM) setelah penerapannya.

Studi ini menyoroti potensi mengintegrasikan teknologi augmented reality (AR) ke dalam alat pendidikan untuk menciptakan pengalaman belajar yang interaktif dan imersif. Umpan balik positif dari para ahli dan siswa menggarisbawahi kemampuannya untuk meningkatkan keterlibatan dan pemahaman, terutama untuk konsep ilmiah yang kompleks seperti sistem kerangka manusia. Hasil penelitian menunjukkan bahwa media pembelajaran berbasis AR dapat menjadi alternatif yang berharga untuk metode pengajaran tradisional, untuk mengatasi tantangan dalam pendidikan sains. Selain itu, penelitian ini berkontribusi pada wacana yang lebih luas tentang penggunaan teknologi dalam pendidikan, memberikan dasar untuk eksplorasi aplikasi AR di masa depan di berbagai mata pelajaran dan tingkat pendidikan. Kebaruannya terletak pada keberhasilan adaptasi AR untuk pendidikan sains tingkat dasar, menawarkan solusi praktis dan inovatif untuk meningkatkan hasil pembelajaran.

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Lampiran Refisi 1



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Pengembangan Aplikasi Human Body Reality Kerangka Tulang Manusia Pada Matapelajaran IPAS Kelas 5 Sekolah Dasar Negeri 02 Balung Jember

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Abstract

Application is a software that is designed according to needs and can also facilitate the implementation of an activity such as a learning application which is designed according to the needs of the school, the purpose of the application is to facilitate learning so that it becomes efficient. This study aims to develop an android-based application, the type of research is Research and Development with the ADDIE model, there are 5 stages, namely analysis, design, development, implementation, and evaluation. The data collection method uses interviews and observations of class teachers, the problems found in the scope of education are that many teachers use lecture methods and visual media in the learning process, making students bored and less involved when learning, therefore new innovations are needed in learning methods to create interesting and interactive learning. The data collection instrument uses a questionnaire with data analysis techniques using qualitative and quantitative analysis. The results of the study in the form of application media validated by media experts and material experts with an average score of 93 (very valid) and media experts with an average score of 95 (very valid). It can be concluded that applications as learning media that can be accessed anywhere help students improve their learning outcomes.

Comment [HB1]: Articles must be written in English to comply with the journal's writing guidelines and template.
Title suggestion:
Developing Mobile Learning Media on Human Bone Skeleton Material for Grade 5 Elementary School Students

Comment [HB2]: State the background and objectives of the research specifically and concisely.

Comment [HB3]: You should focus on explaining the research method. Do not mix it with other explanations that clutter the content of the research method. Explain concisely and specifically how the analysis, design, develop, and implement stages are carried out in this research. Make sure the explanation is concise and specific so that it is easy to understand.

Comment [HB4]: Present the research results completely and concisely, namely the results of the analyze, design, develop, and implement stages. See an example in the following article.
<https://journal.walisongo.ac.id/index.php/jieed/article/view/21977>



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INTRODUCTION

Belajar tentang kerangka tulang manusia melibatkan pemahaman fungsi dan macam-macam tulang membentuk tubuh manusia, dalam mempelajari anatomi penting juga memahami konsep seperti struktur tulang dan fungsi tulang dapat berkembang dan tunggu selama masa kanak-kanak dan remaja, hal ini melibatkan dua dimensi pertama dari pembentukan tulang (Hardianti & Alyani, 2023). Dengan memahami tentang anatomi tulang manusia secara menyeluruh dapat mengetahui struktur dasar tubuh bagaimana sistem tulang berinteraksi dengan tubuh lainnya dan memastikan tubuh dapat berfungsi dengan baik (Wati et al., 2023).

Pentingnya menerapkan layanan pendidikan tertutur, tertinggal, terdepan. Abdul Mu'ti mengemukakan paradigma pembelajaran yang fleksibel di luar sekolah maupun di sekolah memastikan hak pendidikan terpenuhi, dengan mendukung akses pendidikan bermutu dan perbaikan kurikulum merdeka yang lebih adaptif (Taofik & Basit, 2022).

Dalam pendidikan sekolah dasar pada mata pelajaran IPAS, mempelajari tentang anatomi kerangka tulang manusia. Pada saat observasi di sekolah peneliti menemukan kendala dalam penyampaian materi pembelajaran guru menggunakan media berupa gambar kerangka manusia, hal ini dapat menyebabkan kurangnya minat belajar dan rendahnya hasil belajar siswa, dilihat dari aspek penilaian hasil belajar siswa melalui lembar kerja siswa kurang memahami materi yang disampaikan selain itu siswa kurang pantauan dari orang tua terkait hasil belajar di sekolah informasi data yang diperoleh penulis melalui observasi Ibu Ani Azizah sebagai Wali Kelas 5 SDN 02 Balung Jember.

Berdasarkan problem penelitian di atas peneliti mengembangkan sebuah Aplikasi *Human Body Reality* yang mempermudah proses pembelajaran, pada materi kerangka tulang manusia (Alvendri et al., 2023). Adanya media aplikasi yang dapat membantu siswa belajar di sekolah maupun di rumah sebab aplikasi yang dirancang dapat diakses dimanapun dan kapanpun (Kaharuddin et al., 2023).

METHODS

Penelitian ini menggunakan metode pengembangan, *Research and Development* untuk menciptakan produk baru (Septiani & Setiawan, 2024) dan melakukan uji coba ke efektifitas produk yang akan digunakan oleh siswa dalam pembelajaran (Lutfina et al., 2023). Penelitian ini menggunakan model ADDIE yang terdiri dari *analysis, design, development, implementation dan evaluation* agar menghasilkan produk yang efektif (Wahid et al., 2022).

Comment [HB5]: Write all article content in English

Comment [HB6]: Make sure there are no typos or confusion in every word and sentence so that the reader can understand the meaning easily.

Comment [HB7]: Start the introduction section with a problem that shows the importance of this research and development, such as the need for practical and flexible learning media, the need for visualization of bone skeleton material because it is abstract, the existence of students who have difficulty learning this material because it is considered abstract and complicated, or the lack of student interest in learning. Make sure the explanation of the background is relevant and accompanied by literature or empirical sources that can be scientifically justified.

Comment [HB8]: This sentence is confusing due to incorrect spelling and the content is not specific in supporting the need for this research.

Comment [HB9]: Present the relevant issues comprehensively and in detail by involving the results of preliminary studies as well as other relevant research. In addition, discuss the problem to show the importance of solving this problem, and what consequences will arise if the problem is not solved immediately.

Prosedur penelitian dan pengembangan menggunakan model ADDIE yang dikembangkan oleh Robert Maribe Branch berlandaskan filosofis pendidikan penerapan model ini harus bersifat *student center*, inovatif, otentik, dan inspiratif tahapan implementasi model ADDIE memiliki hubungan yang saling mendukung, tahapan model diuraikan sebagai berikut (Waruwu, 2024):

1. *Analysis* (Analisis) terdiri dari dua yaitu analisis kinerja untuk mengidentifikasi masalah terkait media pembelajaran yang digunakan di sekolah juga menemukan solusi untuk memperbaiki, analisis kebutuhan untuk menentukan media pembelajaran sesuai dengan kebutuhan siswa dalam meningkatkan hasil belajar.
2. *Design* (Desain) merancang produk sesuai dengan kebutuhan siswa seperti merancang media pembelajaran yang menarik, hemat energi, terjangkau, dan bermanfaat dengan jangka panjang seperti media pembelajaran menggunakan teknologi aplikasi.
3. *Development* (Pengembangan) mengembangkan media pembelajaran melalui proses menciptakan media, review oleh ahli media, dan meningkatkan media untuk mendukung sebagai alat bantu dalam pembelajaran
4. *Implementation* (Implementasi) proses penerapan menggunakan pre-test dan post-test.
5. *Evaluation* (Evaluasi) produk untuk menilai sejauh mana keefektifan media untuk mengetahui kekuatan dan kelemahan serta bagaimana media dapat mempengaruhi pemahaman terhadap siswa.

Comment [HB10]: Use simple and easy-to-understand sentences, and make sure each paragraph contains only one main sentence and the other sentences are relevant to explain the main sentence. In addition, the paragraphs are also not presented systematically and coherently because they do not explain the reasons for choosing the ADDIE model. Also make sure to cite Robert Maribe Branch's book.

Pengembangan yang akan dilakukan sesuai dengan prosedur bertujuan mencapai hasil yang efektif dan efisien terdiri dari lima langkah yaitu analisis kinerja, desain, pengembangan, evaluasi yang di butuhkan mengembangkan mulai dari pembuatan hingga review perbaikan media (Lyanda et al., 2023).

Dalam penelitian pengembangan untuk mengukur keefektifan media peneliti menggunakan skala liker jawaban setiap instrumen memiliki nilai positif dan negatif (Kuntoro & Fajrie, 2023). Hasil pengukuran menggunakan skala liker membantu untuk mengevaluasi efektifitas media yang akan di kembangkan agar media lebih layak untuk di gunakan saat pembelajaran.

Efektifitas pembelajaran di ukur menggunakan tes N-Gain untuk meningkatkan hasil belajar siswa (Shella Zuliana et al., 2023) dan membandingkan nilai pre-test dan pos-test, hal ini memberikan landasan yang kuat dalam mengevaluasi sejauh mana pembelajaran memberikan kontribusi terhadap pemahaman (Langi et al., 2022). Rumus tes N-Gain digunakan untuk menghitung skor yang di peroleh, hasil dari perhitungan dikategorikan menjadi tiga bagian rendah, sedang, dan tinggi. Hal ini bertujuan untuk membedakan bahwa metode pembelajaran diterapkan efektif dalam meningkatkan satu pemahaman dan keterampilan pada siswa (Masliah et al., 2023).

Comment [HB11]: Describe each stage of ADDIE operationally and scientifically. For example, at the analyze stage, what data is collected, from whom the data is obtained, what scientific instruments are used to collect the data, how to analyze the data. The same applies to the design, develop, and implement stages. Make sure there are no spelling mistakes.

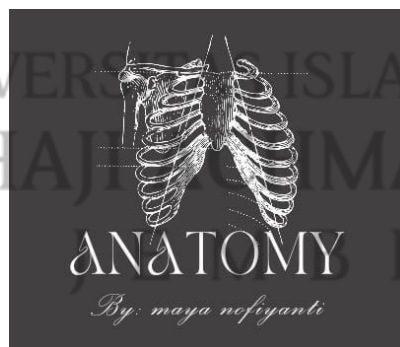
RESULTS

Terciptanya aplikasi pembelajaran untuk mempermudah pemahaman peserta didik aplikasi *Human Body Reality* memberikan dampak manfaat dalam meningkatkan kualitas pendidikan (Lestari & Kurnia, 2023) seperti aksesibilitas yang mudah, pembelajaran interaktif yang menarik, peningkatan hasil belajar, dan mempermudah pengelolaan pembelajaran oleh guru (Nasir, M., 2022). Secara keseluruhan media aplikasi mempunyai berbagai manfaat dapat meningkatkan efektifitas belajar dan memberikan kenyamanan fleksibel sebagai alat bantu belajar siswa dan guru dalam mengelola pembelajaran (Kaharuddin et al., 2023).

Aplikasi yang sudah di desain sesuai kebutuhan siswa, hal ini bertujuan untuk memudahkan dan meningkatkan efektifitas proses pembelajaran, dengan menyediakan fitur interaktif yang mudah diakses oleh siswa. Tampilan aplikasi pembelajaran sebagai berikut (Tri Wulandari & Adam Mudinillah, 2022):

Comment [HB12]: Present the research results systematically and divide them into four sections, namely the research results from the analyze stage, design stage, develop stage, and implement stage.

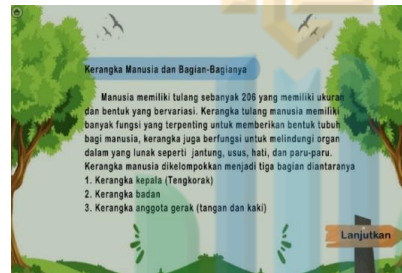
Comment [HB13]: Research results should only contain research results, i.e. research data that has been analyzed to answer the research question. So, do not include citations in the research results. Citation should be displayed in the discussion section when the researcher discusses the research results with theory and some relevant research results.



Gambar 1

Tampilan Beground Aplikasi Pembelajaran

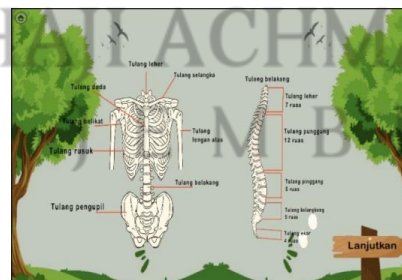
Desain background mencerminkan tema yang akan di pelajari, secara keseluruhan dalam aplikasi pembelajaran dapat menarik perhatian siswa dan memberikan kenyamanan pengguna, serta mendukung semangat belajar yang menyenangkan (Irawan & Rosyani, 2022).



Gambar 2

Tampilan Materi Pembelajaran

Pada tampilan awal berisi tentang materi pembelajaran yang membahas tentang kerangka tulang manusia dan bagian-bagiannya, sehingga siswa dapat memahami topik yang akan di pelajari. Materi pembelajaran yang di rancang sesuai dengan kebutuhan belajar siswa juga mendukung pencapaian tujuan saat pembelajaran sehingga menjadi efektif (Kebijakan & Merdeka, 2023).

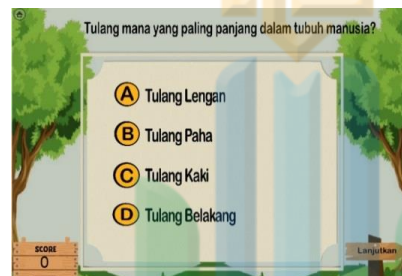


Gambar 3

Tampilan Materi Pembelajaran

Comment [HB14]: Present this image at the design stage to support the description of the media developed.

Materi tentang kerangka tulang manusia tidak hanya berupa deskripsi penjelasan namun aplikasi ini juga menampilkan visual kerangka tulang manusia dan bagian-bagiannya (Akbar et al., 2024). Dengan fitur ini siswa dapat melihat secara detail dan mempermudah pemahaman struktur beserta nama-nama tulang, aplikasi ini di lengkapi dengan latihan soal untuk menguji pemahaman siswa tentang kerangka manusia (Nurhayati et al., 2022).



Gambar 4

Tampilan Materi Pembelajaran

Aplikasi pembelajaran terdapat butir soal beserta skor hasil belajar dari siswa. Pada tampilan ini jika siswa menjawab soal dengan benar akan mendapatkan poin 10 apabila siswa salah menjawab soal maka otomatis berpindah di soal berikutnya (Nurhayati et al., 2022). Fitur ini membantu siswa untuk mengevaluasi tingkat pemahaman untuk meningkatkan pemahaman terhadap materi yang sudah di pelajari (Al-Khassawneh, 2023).

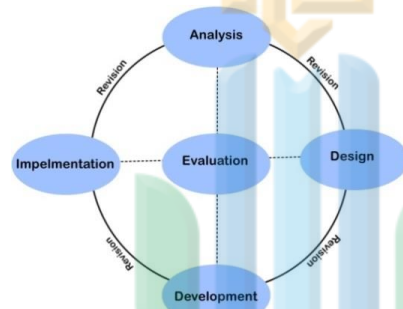


Gambar 5

Tampilan Materi Pembelajaran

Pada bagian akhir setelah siswa belajar dan menjawab butir soal akan terdapat skor hasil dari siswa belajar, penilaian berfungsi sebagai mengevaluasi dan mendukung proses belajar mengajar (Sutarso et al., 2023). Tujuan skor pembelajaran agar terstruktur dan terarah untuk mencapai hasil yang maksimal (Cadiz et al., 2024).

Aplikasi yang sudah di rancang sesuai dengan kebutuhan siswa melalui uji coba menggunakan teori Robert Maribe Branch dengan metode analisis, desain development, implementasi, dan evaluasi (Kuntoro & Fajrie, 2023).



Gambar 5
Metode Penelitian dan Pengembangan
Sumber: Robert Merbie Branch

Comment [HB15]: Present the research steps in the methods section and quote Robert Maribe Branch's model appropriately and directly from his book. Do not mix the content of the research results with explanations of methods and literature so that your research results are not confusing.

Respon peserta didik dengan menggunakan lembar angket untuk menilai daya tarik dan kelayakan media pembelajaran aplikasi human body reality pada mata pelajaran IPAS (Miralda & Marhaeni, 2023). Pengukuran penilaian menggunakan skala liker peserta didik dapat mengisi jawaban dengan keterangan sangat setuju (SS), setuju (S), cukup setuju (CS), tidak setuju (TS), dan sangat tidak setuju (STS) dengan rumus (Kuntoro & Fajrie, 2023).

$$V = \frac{\sum X}{N \times 100\%}$$

Keterangan:

V = Nilai

$\sum X$ = Skor yang di peroleh

N = Skor maksimal

$$V = \frac{\text{Jumlah rata}}{\text{Nilai maksimum} \times 100\%}$$

Comment [HB16]: A description of the research methods should not be presented in the results section.

Berdasarkan data respon peserta didik di peroleh menggunakan angket dari 30 siswa jawaban yang di peroleh, hasil presentase peserta didik menunjukan layak untuk digunakan, analisis angket sebagai pengumpulan data yang valid (Nuraina et al., 2024).

Berdasarkan temuan hasil analisis data dari 4 validator materi, bahasa, materi, dan media menunjukkan media pembelajaran memenuhi katagori valid dan layak digunakan (Fadli et al., 2023).

Tabel 1

Validasi kriteria kelayakan produk

NO	Validator	Presentase	Kriteria
1.	Validator I	93,3%	Layak
2.	Validator II	94%	Layak
3.	Validator III	96,6%	Layak
Nilai rata-rata presentase		94,7%	Layak

Sumber: Dokumen pribadi

Analisis keefektifan menggunakan tes N-Gain yang di peroleh melalui pre-test dan pos-test untuk mengetahui N-Gain tinggi dan rendah menggunakan rumus sebagai berikut (Ananda et al., 2023):

$$N - Gain = \frac{Skor\ post\ test - Skor\ Presentase}{Skor\ ideal\ (100) - Skor\ Presentase}$$

Tabel 2

Skor kriteria normalisasi

Skor N-Gain	Kriteria Normalisasi N-Gain
$0,00 \leq N-Gain \leq 0,30$	Reandah
$0,30 \leq N-Gain \leq 0,70$	Sedang
$N-Gain \geq 0,70$	Tinggi

Sumber: Muhammd andijafir 2023

Intrepetasi skor yang di normalisasikan untuk mengetahui nilai efektifitas (Mea et al., 2024) dengan membandingkan peningkatan dari hasil pre-test ke pos-test, intrepetasi N-Gain berfokus pada pengukuran agar lebih efisien dalam meningkatkan pembelajaran (Meduri et al., 2022).

Tabel 3

Interprtasi efektifitas penggunaan media

Presentase	Kriteria Presentase N-Gain
≤ 40	Tidak Efektif
40-50	Kurang Efektif

Comment [HB17]: Present the media validity score by showing the average score, percentage, and criteria for each aspect assessed by all validators, such as display quality, presentation, language, etc.

65-75
≥ 76

Efektif
Sangat Efektif

Sumber: Triwulandari, Adam Muhdinillah 2022

Interpretasi presentase efektifitas digunakan menentukan keberhasilan penggunaan media aplikasi *Human Body Reality* dalam pembelajaran IPAS kelas V di sekolah dasar negeri Balung Jember (Socrates & Mufit, 2022), dengan melihat hasil dari uji N-Gain peneliti dan guru dapat memenuhi kebutuhan peserta didik secara keseluruhan dalam proses pembelajaran (Ihsan & Akhmad, 2022). Tes N-Gain digunakan untuk mengukur pemahaman siswa dengan membandingkan hasil pre-test dan pos-test tes N-Gain berguna untuk mengevaluasi proses pembelajaran dan membantu meningkatkan kualitas sekolah (Amsul et al., 2022).

Comment [HB18]: Present it in the research methods section.

Comment [HB19]: The results of the research data analysis are still unclear.

DISCUSSION

1. The subheading must consist of at least two parts

The discussion of research results is a crucial section of a scientific article. It explains the significance of the findings, their implications, and how they connect to theory and relevant research. The discussion starts by presenting the main findings, followed by interpretations and implications from the standpoint of theory and other research results. Researchers should compare their research results with existing theories and other studies to clarify their contribution. Additionally, they should explain the limitations of the study and provide recommendations for future research. The discussion section is also where the limitations of the study can be addressed.

Direct quotations containing less than 40 words should be written in paragraphs (not separated) and in quotation marks. If the direct quotation contains 40 words or more, it should be written in a block (separated from the paragraph), indented half an inch from the margin, without quotation marks. It is recommended that articles do not contain too many direct quotations. An example of a direct quote of more than 40 words is as follows.

... when each group member has acquired a different knowledge base and combinations of knowledge are required to solve a problem, collaborative learning (heterogeneous) could be an advantage. If group learning is desirable in school, then teachers need to structure the curriculum to permit each student to acquire a different knowledge base before instructing them in collaborative work (Retnowati, 2012: 338).

A statement can also be the essence of several references, so the sources are written by mentioning all references in alphabetical order and a semicolon (;) to separate the sources this way (Ritter et al., 2007; Sahlberg, 2012; Schunk, 2012).

Comment [HB20]: The discussion of each point of research results is also still unclear.

It is important to note that all references to names follow the rule that the last name is written, regardless of the ethnicity from which the name originates. For example, Burhan Nurgiyantoro and Anwar Efendi are Indonesian names that are written (Nurgiyantoro & Efendi, 2013).

2. The subheading must consist of at least two parts

Next is a discussion of reference sources published by the government. There are two types: books/reports/articles written by teams or agents of government agencies and laws and regulations (legal documents). For the first type, the writing is the same as a book/report/article published by any agency. The researcher should be able to identify the team that wrote the book/report/article (mention the names if available), which sometimes may not be explicitly written. If there is no author's name, mention the publishing institution.

For the second type, it is not necessary to write the author's name but directly mention the name of the legislation. For example, when referring to Indonesian Law No. 14 (2005) or Permendiknas No. 22 (2006), the name of the government institution does not need to be written as the author.

The bibliography is written at the end of the article with the same type and font size as the body of the article. The bibliography is sorted alphabetically. Everything referred to in the article must be written in the bibliography, and everything written in the bibliography must be referenced by writing what is referred to in the article. All citations must follow the ethics of writing, especially when writing direct or indirect quotations.

The Journal of Integrated Elementary Education editorial team advises authors to use software that makes writing articles easy, especially regarding reference sources. These things are mechanical and can take time away from thinking about more substantial matters of research content. However, using a standardized writing format can make it easier for readers to understand the article's content so that they can follow up on the research results presented in the article.

CONCLUSION

Media pembelajaran berbasis “Aplikasi *Human Body Reality* Anatomi Kerangka Tulang Manusia” menyatakan layak digunakan sebagai perantara pembelajaran. Dukungan penilaian dari ahli materi, ahli media, ahli bahasa, dan siswa memberikan nilai positif pada aplikasi dan materi pembelajaran. Pengukuran keefektifan melalui pre-tes post-tes terhadap siswa mencapai KKM setelah menggunakan aplikasi.

Dalam mengukur keefektifan aplikasi pembelajaran peneliti menggunakan Skala Liker dan Tes N-Gain. Skala liker digunakan untuk mengukur keefektifan

terhadap pengguna, media pembelajaran sedangkan Tes N-Gain di gunakan untuk mengukur tingkat pemahaman siswa, sebelum menggunakan media aplikasi dan sesudah, gabungan dari kedua metode ini dapat mengetahui keefektifan aplikasi pembelajaran mulai dari penggunaan dan peningkatan hasil belajar.

Aplikasi yang sudah di rancang sebagai media pembelajaran terdapat materi tentang kerangka tulang manusia, tidak hanya materi tentang deskripsi saja namun di dalam aplikasi tersebut terdapat visual beserta nama-nama kerangka tulang manusia, fitur di dalam aplikasi juga terdapat butir-butir soal sehingga guru dapat melihat statistik hasil jawaban.

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8. Kepada teman-teman yang berkontribusi mengsupport selama penelitian dan proses pembuatan Jurnal Sinta 2.

Comment [HB21]: This conclusion is not representative and specific in explaining the findings at the analyze, design, develop, and implement stages so that the value of the resulting innovation is not clear. In addition, the implications of the research results have not been well explained. Read other relevant articles so that you can understand how to write a good conclusion.

Comment [HB22]: You should only acknowledge the person who was directly involved in the research and is not included as a second author. Present the acknowledgments in one short paragraph.

APPENDIX (IF ANY)

The section contains appendices that support the content of scientific articles, such as research instruments, treatment scenarios, and data URLs that are openly presented to the public.

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Comment [HB23]: Read, compare, and quote some of these articles to improve the quality of your article discussions.

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Comment [HB25]: Add the DOI or URL.

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Developing Mobile Learning Media on Human Bone Skeleton Material for Grade 5 Elementary School Students

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Abstract

Research into the development of application products as a learning medium for elementary school students as a learning medium to increase enthusiasm for learning. This research aims to test the effectiveness of validity and evaluate the application as a learning medium. This research uses the development method with the ADDIE model, the results of observations show that several students have problems when learning about the human skeleton. This research develops an application which contains material and questions along with scores, at the design stage using Kilonotes and Smart Apps Creator. The results of the application media validity test received a score of 95% from media experts, assessing aspects of application display design, letters, images and practicality. The assessment given by material experts was 90% of the material, questions and practical learning aspects. The assessment from students regarding application media as a learning support was very helpful because practical applications were easy to use when studying outside of school or at school. Statistical tests show significant results, the values obtained are high on average. Students gave a positive response to the media with a score of 96% from 30 students. It can be concluded that using the application as a learning medium for grade 5 human skeleton material shows that it is valid and suitable for use by students

Comment [HB27]: The meaning of this text is confusing, write in clear language. For example, the result of analyzing the data ... using the formula ... shows ...



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INTRODUCTION

Learning media are tools and materials used by teachers and students in the teaching and learning process. Learning media has a function to stimulate students' thinking patterns to be more real so that learning objectives can be achieved. (Pohan et al., 2022)

Comment [HB28]: Move all quotes before the full stop

Another definition of learning media is a tool used to make the learning process more interesting and easier to understand. Media can be in the form of images, videos, real objects, imitation objects such as applications and so on. (Mastuti et al., 2024)

Comment [HB29]: Each definition should have a citation or reference source, and each paragraph should contain one main idea and several explanatory sentences.

Simply put, learning media is a tool used by teachers to attract students' attention and stimulate students' thought patterns so that they can understand learning materials more deeply.

Based on the pre-operation conducted by the researcher, it was found that there was a lack of variation in learning media used by educators, especially in grade V in the subject of science on the human skeleton material. The media used was only in the form of a picture of a human skeleton, which resulted in students having difficulty understanding the learning material and some students felt bored.

Viewed from the aspect of assessing student learning outcomes through student worksheets, students do not understand the material presented, in addition, students lack parental monitoring regarding learning outcomes at school, data information obtained by the author through observations by Mrs. Eni Azizah as the Homeroom Teacher of Class 5 SDN 02 Balung Jember. With these problems, the researcher has an innovation to develop image learning media to be more interesting, namely in the form of applications to improve student learning outcomes.

Comment [HB30]: Describe a relevant problem from the existing research, and explain why it needs to be addressed.

The importance of this research and development is to follow the demands of technological developments that continue to increase in every era. In addition, this research and development can increase students' interest in learning because this application is designed with an attractive and interactive appearance, with material and question features along with the scores obtained. The importance of application development in Elementary Schools greatly helps students learn in an easier and more enjoyable way of course, besides the application can be used anytime, anywhere.

Comment [HB31]: Support your statement with references

By using the Human Body Reality application, the learning process becomes more practical. Because this material can be accessed anywhere and has been adjusted to the student's learning style, where students can not only learn at school but can learn at home. In addition, this application is also a practical solution for

Comment [HB32]: Explain why learning this material needs to use apps from the aspects of the characteristics of the material and the characteristics of the students. Explain by listing the literature sources.

Comment [HB33]: Support your statement with references

teachers in providing up-to-date learning materials to students. (advantages of the human body reality apk)

This application is not only practical but also flexible because of the game and quiz features that make the learning process more exciting. With this flexibility, it can make the learning process more effective.

The human body reality application covers the material of the human skeleton, Bones are living tissues that can change from childhood, adolescence, to adulthood. The human body reality application not only covers the material but also presents images and other interesting features, such as question games and various supporting colors.

According to research conducted by Prasetyo with the title The development of an Augmented Reality Application as a Human Anatomy Learning Media Based on Android has succeeded in increasing interest in studying the composition of human anatomy organs by presenting an interesting and interactive learning experience. (Prasetyo et al., 2024)

Based on the research problems above, the researcher developed a media in the form of a Human Body Reality Application that can facilitate the learning process, on the material of the human skeleton, so that it can improve student learning outcomes. (Alvendri et al., 2023). The existence of application media that can help students learn at school or at home because the applications that are designed can be accessed anywhere and at any time. (Kaharuddin et al., 2023).

METHODS

This research uses the development method, Research and Development to create new products. (Septiani & Setiawan, 2024) and conduct trials on the effectiveness of products that will be used by students in learning (Lutfina et al., 2023). This study uses the ADDIE model which consists of analysis, design, development, implementation and evaluation to produce effective products. (Siswo Handoyo & Suhardianto Suhardianto, 2021)

Stages Research and Development ADDIE model based on the philosophy of education. The implementation of this model must be student-centered, innovative, authentic, and inspiring, the stages of implementing the ADDIE model have a mutually supportive relationship, The model stages are described as follows (Waruwu, 2024):

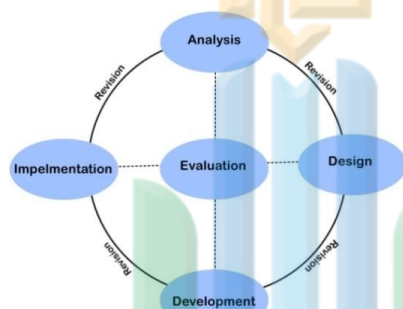


Figure 1
Research and Development Methods Source: Robert Merbie Branc

6. *Analysis*(Analysis), analysis of student and teacher needs to determine learning media that suit the needs in order to improve learning outcomes.
7. *Design*(Design) designing products according to student needs, such as designing learning media that are attractive, energy efficient, affordable, and useful in the long term, such as learning media using application technology.
8. *Development* (Development) develops learning media through the process of creating media, as well as conducting validity tests by experts.
9. *Implementation* (Implementation) the process of applying media in the field.
10. *Evaluation* (Evaluation) of the product to assess the extent of the effectiveness of the media to identify strengths and weaknesses and how the media can influence students' understanding.

The development that will be carried out in accordance with the procedure aims to achieve effective and efficient results consisting of five steps, namely performance analysis, design, development, evaluation, which is needed to develop from creation to review of media improvements.(Lyanda et al., 2023).

In development research to measure the effectiveness of the media, researchers use a Liker scale, where each instrument has positive and negative values.(Kuntoro & Fajrie, 2023). The measurement results using the Liker scale help to evaluate the effectiveness of the media to be developed so that the media is more suitable for use during learning.

Learning effectiveness is measured using the N-Gain test to improve student learning outcomes.(Shella Zuliana et al., 2023)and comparing pre-test and post-test scores, this provides a strong basis for evaluating the extent to which learning contributes to understanding.(Langi et al., 2022). The N-Gain test formula is used to calculate the scores obtained, the results of the calculation are categorized into three parts, low, medium, and high. This aims to distinguish that the learning method is

applied effectively in improving one understanding and skills in students.(Masliah et al., 2023).

Student responses using a questionnaire sheet to assess the attractiveness and feasibility of the human body reality application learning media in the science subject.(Miralda & Marhaeni, 2023). Assessment measurement using a Likert scale, students can fill in the answers with the following information: strongly agree (SS), agree (S), quite agree (CS), disagree (TS), and strongly disagree (STS) with the formula(Kuntoro & Fajrie, 2023).

$$V = \frac{\sum X}{N \times 100\%}$$

Description:

V = Value

$\sum X$ = Score obtained

N = Maximum score

$$V = \frac{jumlah\ rata - rata}{skor\ max\ X\ 100\%}$$

Effectiveness analysis using the N-Gain test obtained through pre-test and post-test to determine high and low N-Gain using the following formula(Ananda et al., 2023):

$$N - Gain = \frac{Skor\ post\ test - Skor\ Presentase}{Skor\ ideal\ (100) - Skor\ Presentase}$$

Table 1

Normalization criteria score

N-Gain Score	N-Gain Normalization Criteria
$0.00 \leq N-Gain \leq 0.30$	Low
$0.30 \leq N-Gain \leq 0.70$	Currently

N-Gain ≥ 0.70

Tall

Source: Muhammd Andijafir 2023

Interpretation of normalized scores to determine effectiveness values (Mea et al., 2024) By comparing the improvement from pre-test to post-test results, N-Gain interpretation focuses on measuring to be more efficient in improving learning. (Meduri et al., 2022).

Table 2

Interpretation of the effectiveness of media use

Presentation	N-Gain Percentage Criteria
≤ 40	Ineffective
40-50	Less Effective
65-75	Effective
≥ 76	Very Effective

Source: Triwulandari, Adam Muhdinillah 2022

RESULTS

A. The results of developing human body reality application products

1. Analysis

Researchers conducted observations in order to analyze problems and needs. The problem of lack of variation in learning media was found, so researchers concluded that the needs required by students and teachers were more variations in learning media. Therefore, researchers want to develop learning media in the form of human body reality applications.

2. Design

At the design stage, researchers design human skeleton sketches, determine colors, present materials and questions in the form of games and add supporting features. The following researchers explain in detail about the design of the human body reality application:

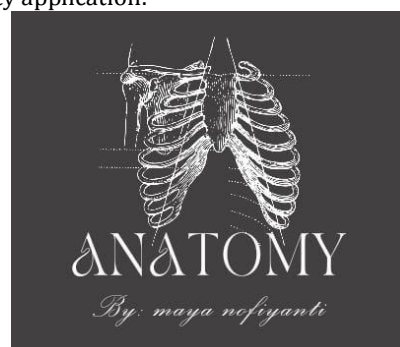


Figure 2
Learning Application Background View

Comment [HB34]: Describe the results of the analysis by describing the problem specifically, and the data should be complete to be strong enough to demonstrate the students' need for the developed app and explain the importance of developing an app on the selected material to address the problems found.

The background design reflects the theme that will be studied, overall the learning application can attract students' attention and provide user comfort, as well as support a fun learning spirit. (Irawan & Rosyani, 2022).

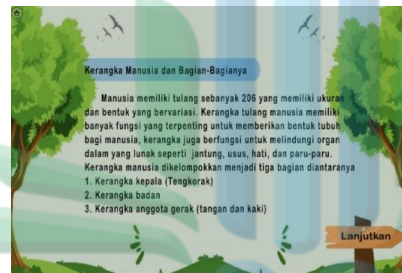


Figure 3

Learning Material Display

The initial display contains learning materials that discuss the human skeleton and its parts, so that students can understand the topics to be studied. Learning materials that are designed according to students' learning needs also support the achievement of learning objectives so that they become effective.

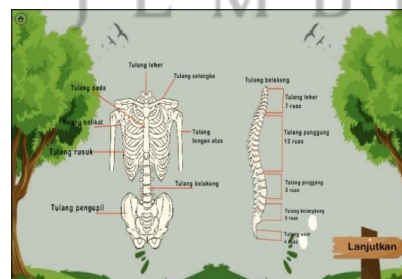


Figure 4

Learning Material Display

The material about the human skeleton is not only in the form of explanatory descriptions, but this application also displays visuals of the human skeleton and its parts. (Akbar et al., 2024). With this feature, students can see in detail and make it easier to understand the structure and names of bones. This application is equipped with practice questions to test students' understanding of the human skeleton. (Nurhayati et al., 2022).

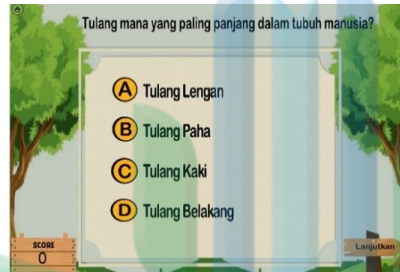


Figure 5

Learning Material Display

The learning application contains question details along with student learning outcome scores. In this display, if students answer the question correctly, they will get 10 points. If students answer the question incorrectly, they will automatically move to the next question. (Nurhayati et al., 2022). This feature helps students to evaluate the level of understanding to improve understanding of the material that has been studied. (Al-Khassawneh, 2023).



Figure 6

Learning Material Display

At the end, after students have studied and answered the questions, there will be a score of the results of the students' study. The assessment functions to evaluate and support the teaching and learning process. (Sutarso et al., 2023). The purpose of learning scores is to be structured and directed to achieve maximum results. (Cadiz et al., 2024).

3. Development

Creating an application in the form of a human body reality that can be downloaded and accessed offline. In the development stage, researchers conducted validity tests by experts. Both material experts, media experts and language experts.

4. Implementation

After being declared feasible by experts. Then the human body reality application media can be applied in class V. The application is carried out in 2 stages. The first stage is carried out on a small scale of 10 students, then the student and teacher response process is carried out. If the student and teacher responses are good, it will be continued to the second stage, namely a large-scale trial or field test on 30 students. in the application of small and large scales, pre-test and post-test activities are carried out.

B. Validation results

Based on the findings of the data analysis results from 4 validators of material, language, materials and media, it shows that the learning media meets the valid category and is suitable for use.(Fadli et al., 2023).

Table 3

Validation of product eligibility criteria

NO	Validators	Presentation	Criteria
1.	Validator I media	93.3%	Worthy
2.	Validator II material	94%	Worthy
3.	Validator III language	96.6%	Worthy
Average percentage value		94.7%	Worthy

Source: Personal documents

According to table 3, the researcher lists the validation results from several experts. The results of the media expert validation obtained a result of 93.3%.

with a feasible category. The results of the validation of the material expert obtained a result of 94% with a feasible category, with a feasible category, and the results of the language validation were 96.6% with a feasible category. If the overall average is obtained, the results are 94.7% with a very feasible category. Therefore, the human body reality application learning media can be applied in class V

Based on the data on student responses obtained using a questionnaire from 30 students, the results of the student percentage showed that it was suitable for use, questionnaire analysis as valid data collection.(Nuraina et al., 2024).

Comment [HB35]: Jelaskan nilai setiap aspek yang diperiksa oleh validator ahli.

Comment [HB36]: Separate the research results from the discussion section. See the example in the following article.
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<https://journal.walisongo.ac.id/index.php/ieed/article/view/22022>
<https://online-journals.org/index.php/i-jim/article/view/41705/13807>



CONCLUSION

The results of the research on the development of learning media "Human Body Reality Application of Human Bone Skeleton Anatomy" in the Natural Science subject in Elementary Schools have been declared suitable for use as a learning intermediary. Support for assessments from material experts, media experts, language experts, and students gave positive values to the application and learning materials.

The results of the media expert validation obtained a result of 93.3% with a feasible category. The results of the material expert validation obtained a result of 94% with a feasible category, with a feasible category, and the results of the language validation were 96.6% with a feasible category. If the overall average was obtained, the results were 94.7% with a very feasible category. Measurement of effectiveness through pre-test and post-test on students achieving KKM after using the application.

ACKNOWLEDGMENTS (IF ANY)

I would like to express my gratitude to the presence of Allah SWT, thanks to His grace and guidance, I was able to complete the Sinta 2 journal well. On this occasion, I would like to express my deepest gratitude to all parties who have provided support, guidance, and assistance during the process of compiling the journal. Thank you to Mr. Prof. Dr. H. Hepni, S.Ag., MM as the Chancellor of the State Islamic University of Kiai Haji Achmad Siddiq Jember, Mr. Dr. H. Abdul Mu'is, S.Ag., M.Si as the Dean of FTIK, To Mr. Dr. Nuruddin, M.Pd.I., as the Head of the FTIK Department, To Mr. Dr. Imron Fauzi, M.Pd.I as the HEAD OF THE PGMI PROGRAM who has approved the Sinta 2 Journal, To my mother Ira Wati who has provided support and endless prayers and has always been a source of information.

APPENDIX (IF ANY)

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Comment [HB37]: Check the references again. Make sure to include only the references cited in the body of the article.

Comment [HB38]: Show the citation of this reference or remove it if it is not actually cited.

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J E M B E R

Lampiran 1 : Surat Pernyataan Keaslian Tulisan

PERNYATAAN KEASLIAN TULISAN

Yang bertanda tangan di bawah ini :

Nama : Maya Nofiyanti
 NIM : 212101040053
 Program Studi : Pendidikan Guru Madrasah Ibtidaiyah (PGMI)
 Fakultas : Tarbiyah dan Ilmu Keguruan (FTIK)
 Institusi : UIN Kiai Haji Achmad Siddiq Jember

Menyatakan dengan sebenarnya bahwa dalam hasil penelitian ini tidak terdapat unsur-unsur penjiplakan karya penelitian atau karya ilmiah pernah dilakukan atau dirujuk orang lain, kecuali yang secara tertulis dikutip dalam naskah ini dan disebutkan dalam sumber kutipan dan daftar pustaka.

Apabila dikemudian hari ternyata hasil penelitian ini terbukti terdapat unsur-unsur penjiplakan dan ada klaim dari pihak lain, maka saya bersedia untuk diproses sesuai dengan peraturan perundang-undangan yang berlaku.

Demikian suat pernyataan ini saya tulis dengan sebenar-benarnya dan tanpa paksaan dari pihak manapun.

Jember, 18 April 2025

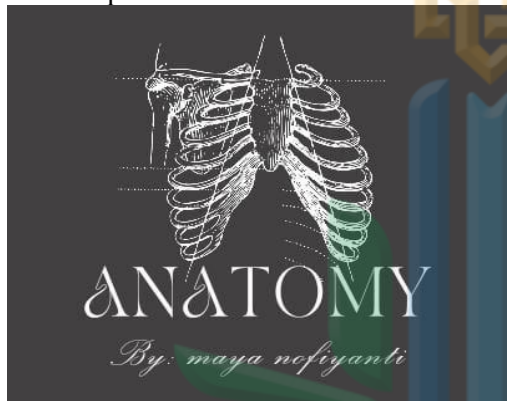
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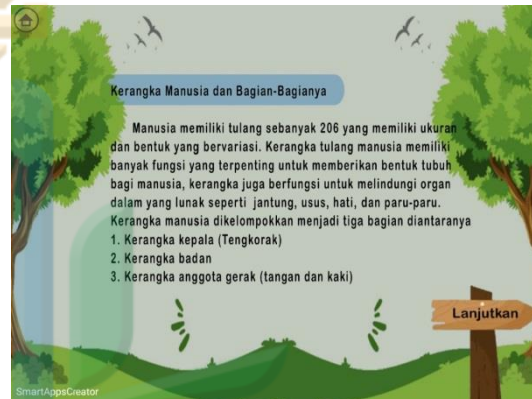
MAYA NOFIYANTI
 NIM. 212101040053

D Lampiran 2: Produk Aplikasi Pembelajaran

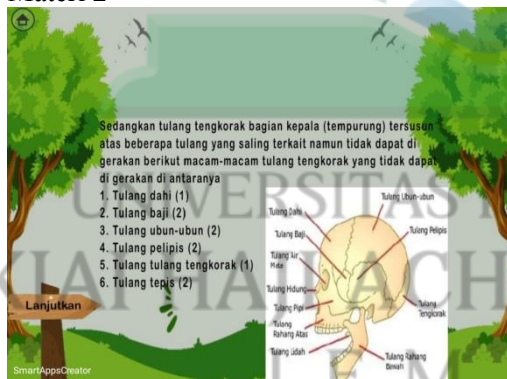
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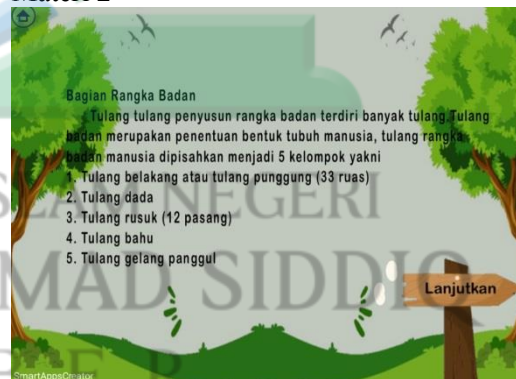
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Materi 2



Materi 2



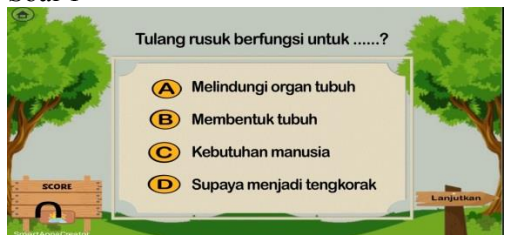
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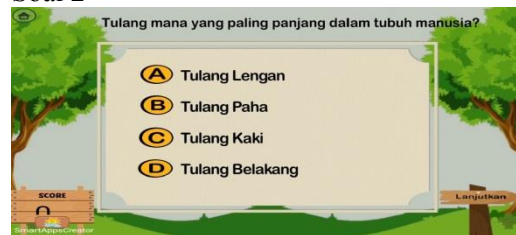
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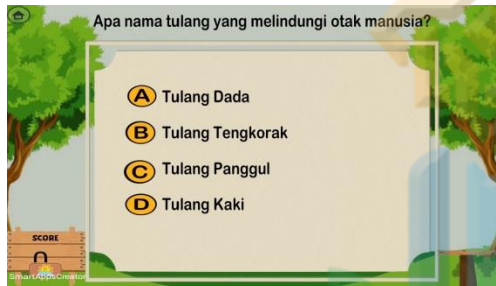
Soal 1



Soal 2



Soal 3



Sekor



Aplikasi dapat di akses melalui : <https://wa.me/qr/PPUUCAQHJBZO1>

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Lampiran 3 : Dokumentasi Penelitian



Lampiran 4 : Biaya Publikasi

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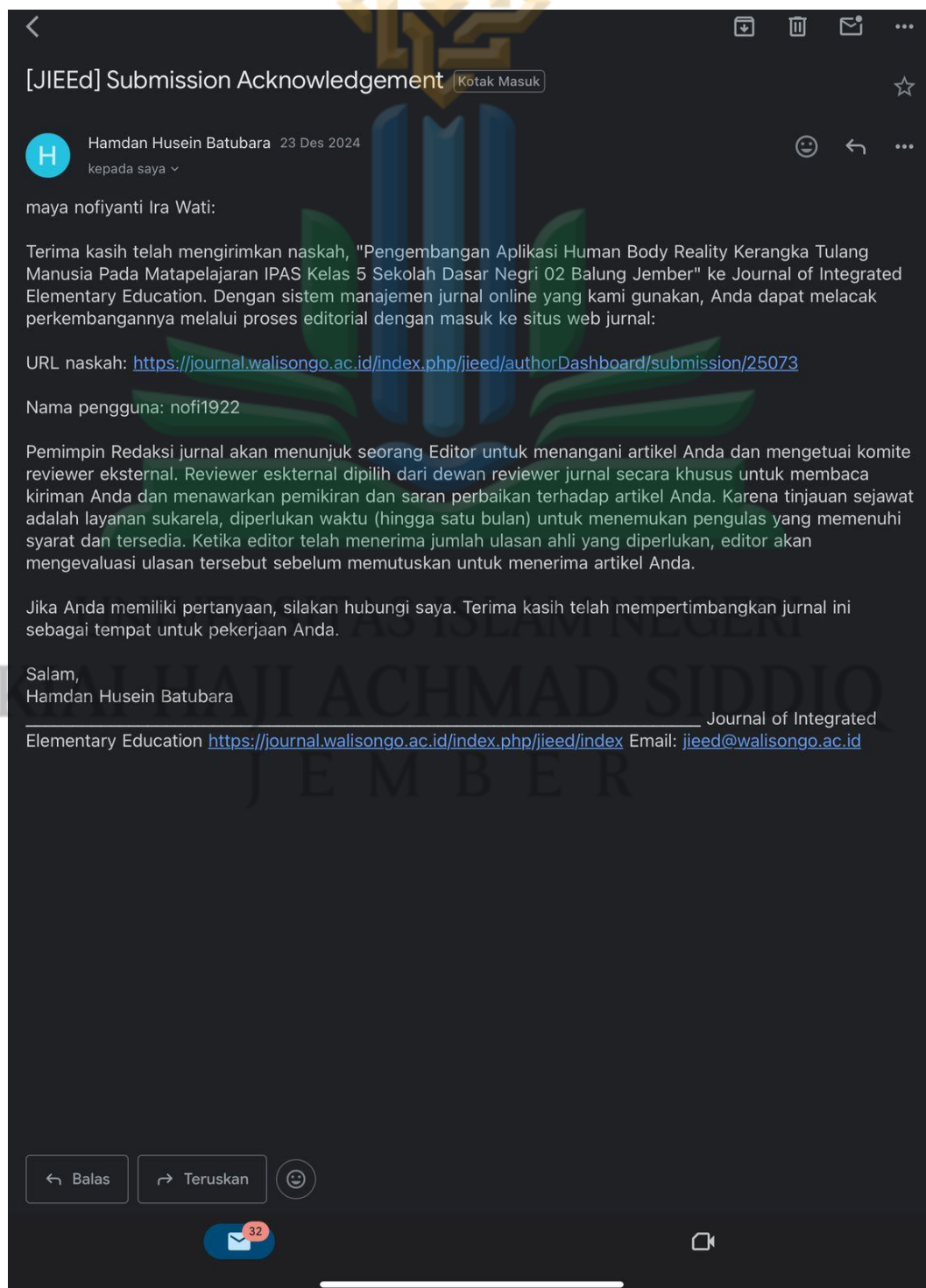
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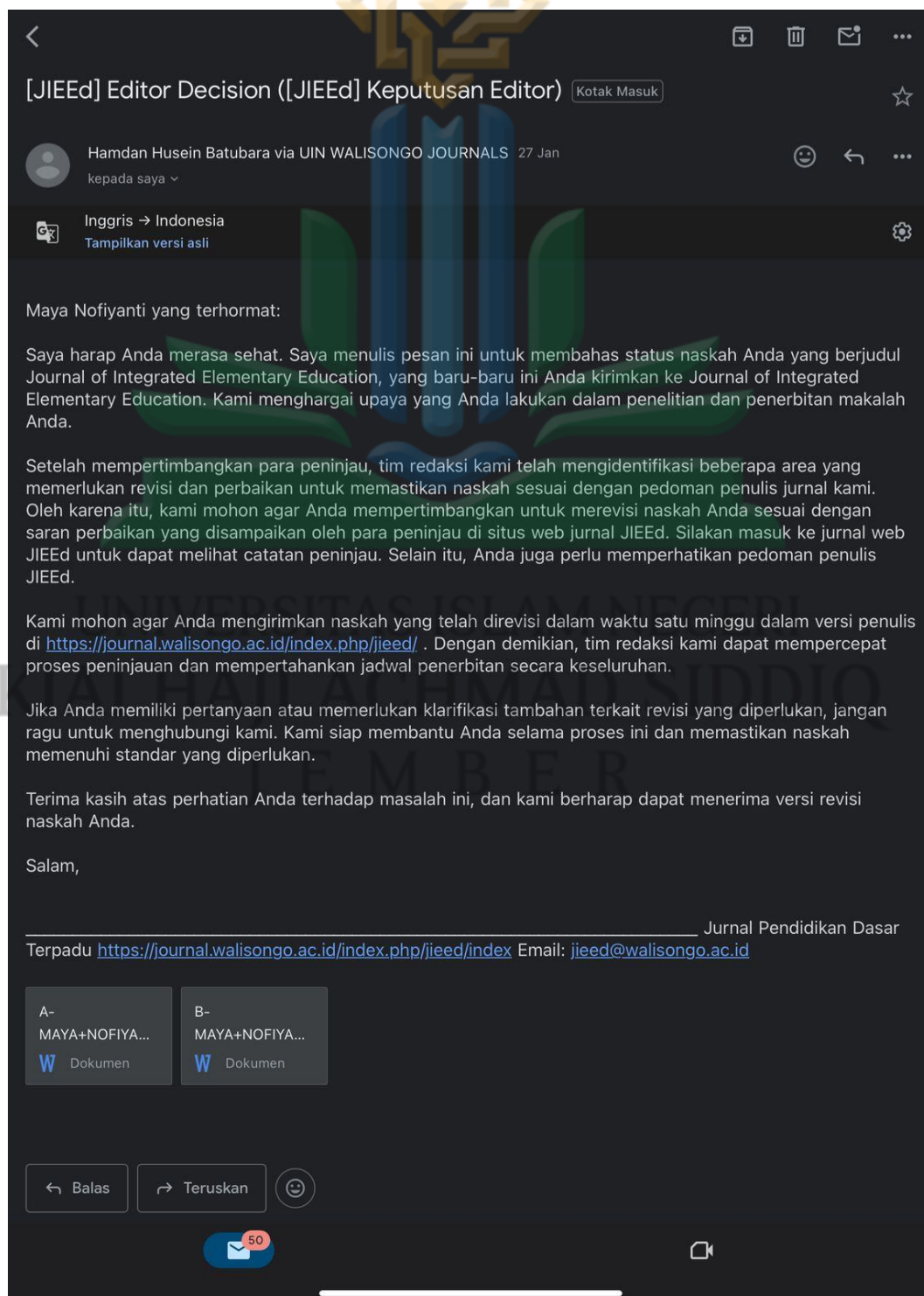
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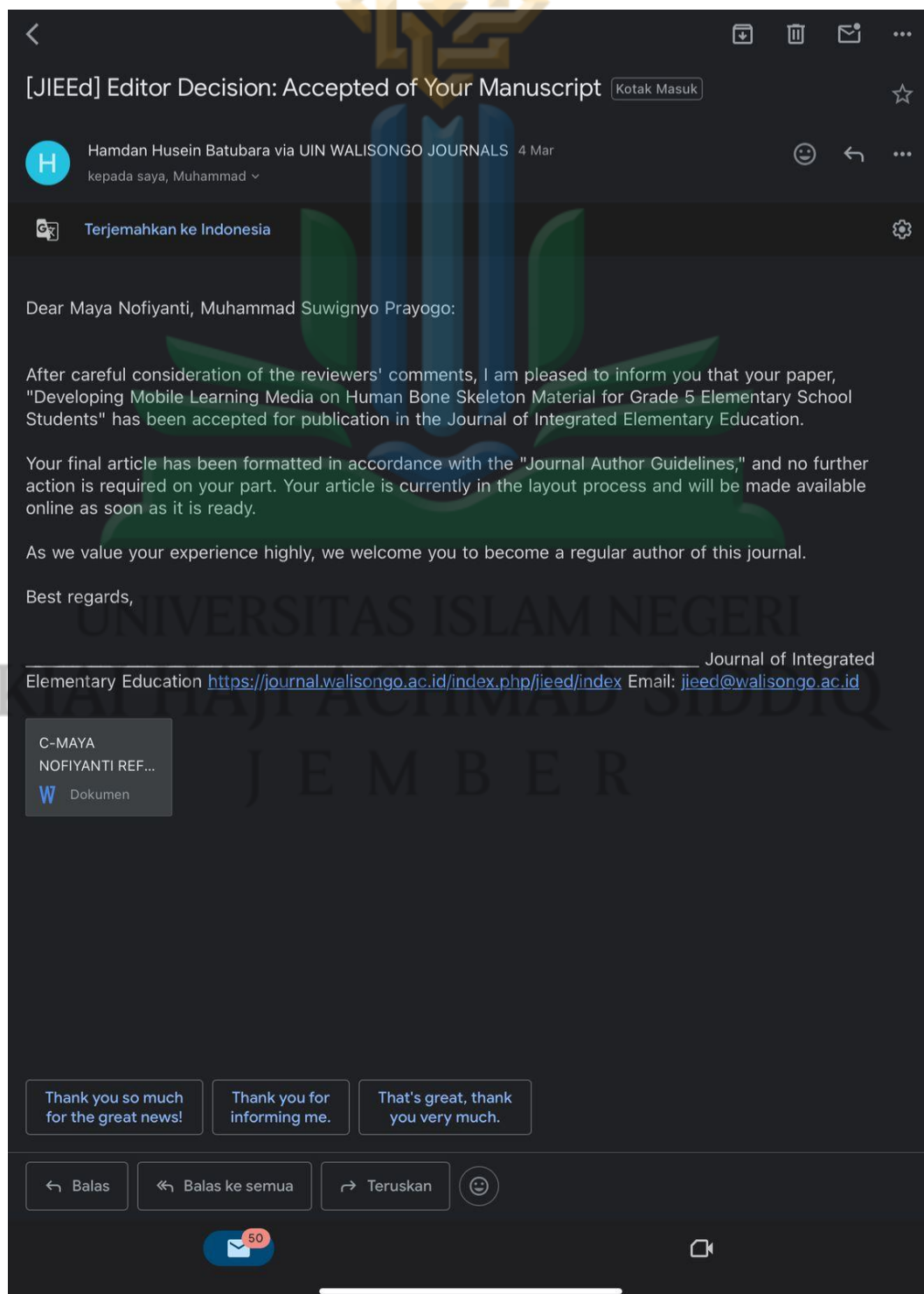
Lampiran 5 : Bukti Upload Jurnal Sinta 2



Lampiran 6 : Bukti Pengiriman Refisi 1 dan 2



Lampiran 7 : Bukti Diterima Publikasi



Lampiran 8 : Hasil Plagiasi

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LOCATION	MATCHED DOMAIN		%	SOURCE TYPE
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4	journal.lppmunindra.ac.id		1	Publication
5	Thesis Submitted to Shodhganga Repository		1	Publication
6	edukatif.org		1	Publication
7	PENGARUH MODEL SIKLUS BELAJAR 5E (Engagemant, Exploration, Explanation, Elabora By Andra Rian Mulyna, Tuti Kumi, Yr-2017,2,28		<1	Publication
8	digitalcommons.usu.edu		<1	Publication
9	digilib.uinkhas.ac.id		<1	Internet Data
11	etheses.uin-malang.ac.id		<1	Publication
12	Accountability Data and Decision Making in Texas Bilingual Education Programs by Gates-2005		<1	Publication
13	journal.uhamka.ac.id		<1	Internet Data
14	tua-au.academia.edu		<1	Internet Data

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 - SMP Satya Dharma Balung
 - SMK Teknologi Balung
- Prestasi Non Akademik

- Juara 2 Open Tournamen Pencak Silat Banyuangi 2023
- Juara 3 Pencaksilat kelas B Dewasa Blambangan Championship 3 2023
- Juara 1 Pencaksilat kelas B Dewasa PSHT Cup Cilacap 2023
- Pesilat Terbaik PSHT CUP Cilacap 2023
- Juara 2 Pencaksilat kelas B Dewasa Putri Tingkat Mahasiswa Birendra UNEJ Cup 2024
- Juara 1 Pencaksilat Piala Bergilir IPSI Jombang Mojokerto 2024

- Juara 1 Pencaksilat TRY IN Pencak Silat Tingkat Mahasiswa PGRI SEMARANG 2024
- Juara 1 Pencaksilat PSHT CUP 2 Cabang Demak Jawah Tengah Tingkat Dewasa 2025



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