**ICCCM-JOURNAL OF SOCIAL SCIENCES AND HUMANITIES**
2024; 3(1): 68-73
Published online 02 02 2024 ( https://icccmjssh.com/ )
https://doi.org/10.53797/icccmjssh.v3i1.9.2024
e-ISSN 2811-4469

# Development of Trasedu Media on Human Hearing Material

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**To Cite This Article:** https://doi.org/10.53797/icccmjssh.v3i1.9.2024

Received 3 January 2024, Revised 17 January 2024, Accepted 31 January 2024, Available online 2 February 2024

**Abstract:** This research is motivated by students' understanding of human auditory material that is not optimal. Based on interviews with educators, this is due to the use of the learning environment in the form of poster media which is less attractive so that daily assessments are still below the minimum standard of perfection set by the school. The purposes of this study were 1) to analyze needs, 2) to analyze the feasibility and 3) to test the effectiveness of trasedu media for class IV MI students at KKG MI Sedan District, Rembang Regency. This research is a development research or R&D using the Borg and Gall development method to develop a Trasedu environment model to increase students' understanding of class IV MI. The results showed that 1) based on observations and questionnaires, information was obtained that the level of need for the Trasedu platform was quite high 2) the feasibility of developing this platform was tested with the results collected points is very good and 3) based on the results of the t-test that t count > t table, namely 17.647 > 1.669, it can be concluded that Trasedu media is effective in increasing students' understanding of KKG Class IV MI MI, Sedan District, Rembang Regency. Based on the results of this development research, it can be concluded that 1) Trasedu media is very necessary for students, 2) Trasedu media is suitable for learning and 3) Trasedu media is effective in increasing student understanding.

**Keywords:** Augmented Reality, human sense of hearing, Trasedu media

## 1. Introduction

Learning is a teaching and learning activity between teachers and students to understand the learning objectives of a particular material (Asih, 2016). Learning objectives are achieved when teachers and students participate actively in teaching and learning activities. An active, effective and enjoyable learning process makes the understanding built more complete and meaningful (Inah, 2015). Learning will be significantly successful when the teacher knows how to use the right media for delivering the material being taught and supported by existing technology.

Utilization of media that uses the right technology creates a critical nature in students, a sense of curiosity and creativity. Natural Sciences (IPA) are natural sciences that are directly related to human life and study everything that exists in the universe. IPA is a collection of knowledge that includes concepts, facts, and principles and processes of scientific discovery (Dewana, 2017). Teaching science in elementary schools needs to keep up with the times because good education is education that always develops with the changing times (Jannah & Atmojo, 2022), in the era of development of digital technology 4.0 (For Point Zero) we must not ignore the optimization of digital-based media as a means of delivering learning material (Humairah, 2022).

The natural science learning problem most often experienced by elementary school students in general is when the material presented in textbooks can only be imagined by students without seeing a real picture of the material (Hendajani, 2018). The use of technology-assisted media which is rarely used by teachers is one of the problems that must be resolved immediately. There are many things to do in science learning (Nahdi et al, 2017). Learning media based on Information and Communication Technology (ICT) can help learning activities (Widayanti et al., 2022). Teachers can utilize technology-based media in an effort to create an interesting and innovative learning environment according to the stage of development and the conditions of students (Heryani et al., 2022). In the learning process the presence of the media has a significant meaning to make abstract material that is difficult for students to understand more concrete (Dasar et al., 2022).

The educational background of most of the class teachers in MI Sedan District is Islamic religion teachers. This affects the pattern of learning in class, learning media is still rarely used. The media commonly used as learning support media are posters, pictures of body parts that can only be seen and have no interactive elements so that it often makes students bored and bored.


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The teacher's task is to create a learning atmosphere that can be fun and students can understand the material provided by the teacher in learning (Annisa et al., 2021). The linearity of teacher education has an important role in student achievement (Gisselawati & Fatonah, 2022), the educational background of teachers influences the learning process in the classroom (Rehalat & Nurul 'ainy, 2022), so that improving teacher academic qualifications is urgent (Yasin, 2022). Whether the learning process is good or bad and whether learning objectives are achieved or not really depend on the competence of the teacher, especially pedagogical competence (Murod et al., 2021).

The results of the initial observations that the researchers obtained from two Madrasah Ibtidaiyah, namely MI Sabilul Muttaqin and MI Riyadlotut Thalabah found several learning problems that were almost the same, problems found in MI Sabilul Muttaqin, (1) Teacher centric (2) conventional learning models (3) lack of creativity teachers in the use of educational media, as well as MI Riyadlotut Thalabah: (1) learning is still teacher-centered, (2) the use of media is not optimal, (3) the science laboratory learning environment is not perfect, and (4) the teacher's ability to use technology which is still not good.

Based on observations on students' daily assessment results for science content material on the sense of human hearing in the previous year, it was also still low, namely the average score for MI Sabilul Muttaqin was 62 and MI Riyadlotut Thalabah was 61, lower than the completeness score set by madrasas. Coincidentally, it's 72.

The problems of low learning outcomes and the inactivity of students in the learning process can be overcome with various and innovative models, media, approaches and learning methods (Anan et al., 2020). Constraints like these are often encountered in the practice of implementing thematic learning in the 2013 curriculum (Diantoro et al., 2020). Learning requires interesting, creative and innovative learning media so that children are motivated to learn (Indriasih et al., 2020). The use of media is an important requirement and cannot be abandoned for the success of the learning process. Learning media can make students think and analyze the learning material provided by the teacher well (Julianto et al., 2021).

Interviews with fourth grade teachers in two MIs yielded almost the same conclusion that there were many factors causing the use of technology-based learning media to be not widely practiced. Some of these factors include the lack of training on the use of technology for class teachers, unstable internet networks in Madrasahs, as well as the limited ability and knowledge of teachers in finding information about various applications that can be used as learning media. Many teachers do not apply technology in the classroom because of the limitations that teachers have in making learning media (Ismail, 2021).

Previous research that was used as a reference by researchers included research by Dewi et al, Nugrohadi & Anwar, Paat et al, and Sugiarto. In research conducted by Dewi and colleagues in 2022, it was found that the use of Assembler Edu learning media applications can improve student learning outcomes. Similar findings were also reported by Nugrohadi and Anwar in the same year, in which students considered that Assembler Edu's Augmented Reality (AR) media was very relevant to the material provided and the main duties that must be fulfilled as Pancasila students. In addition, research conducted by Paat and the team in 2021 shows that the Assembler Edu application is very useful for helping students study during the COVID-19 pandemic. Meanwhile, according to Sugiarto in 2022, the use of three-dimensional (3D) media with AR Assembler Edu can increase student understanding by up to 96.97%, so that they are motivated to learn.

This research is important because it is very rare that research discusses the development of Augmented Reality-based learning media at the elementary school level so it is hoped that this research can become a reference for alternative technology-based media that are familiar with students' daily habits. Therefore, The purpose of this study is to analyze students' needs for the development of Trasedu media so that later this media can be useful to help facilitate students in learning subject matter, analyze the feasibility of developing Trasedu media by soliciting input and evaluation from experts in the fields of media, materials and user experts so that This media is really valid and can be used to deliver materials that require a real picture for students about material that cannot be seen directly and to analyze the effectiveness of the development of Trasedu media as one of the proofs that this media is really effective for increasing students' understanding in one subject matter.

## 2. Conceptual Framework

Based on observations and structured interviews conducted in March 2022, it was found that in learning science, teachers did not make use of technology in carrying out learning activities in class. Due to various factors, almost all teachers deliver material textually according to the handbook.

Learning media developed by researchers is Trasedu media development. After validation, the media is revised so that it can be repaired. The results of the learning model that has been revised are then continued with a large-scale test as a usage test which is carried out with more subjects, so that it can be tested as a learning medium. In the large-scale test, the researcher uses the pretest and posttest methods to find out whether students' understanding has increased or not. To develop Trasedu media development for class IV MI students, the following framework can be seen in figure 1.

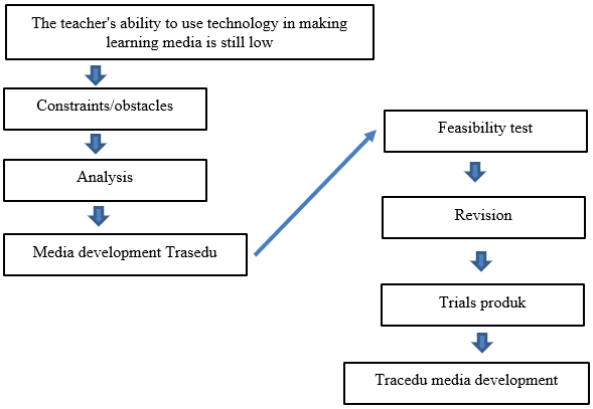



**Fig. 1 - Frame of mind.**

## 3. Methodology

### 3.1 Research design

The research design used by researchers is Research and Development from Borg and Gall. The definition of development research or Research and Development (R&D) is often interpreted as a process or steps to develop a new product or improve an existing product (Putra et al., 2020). Development research is a process of developing and validating educational products (Effendi & Hendriyani, 2016), this model is able to produce a product with high validation value and encourages a non-stop process of product innovation (Maydiantoro, 2020).

### 3.2 Respondents of the study

Respondents from this study were fourth grade students at MI Sabilul Muttaqin and MI Riyadlotut Thalabah who were in the MI KKG environment, Sedan District, Rembang Regency. Class IV at MI Sabilul Muttaqin as an experimental class totaling 28 students and class IV at Riyadlotut Thalabah as a control class with a total of 38 students.

## 4. Findings and Discussion

The following is research data on Trasedu media needs analysis for learning material for the sense of human hearing for class IV MI students in Sedan District, Rembang Regency.

### 4.1 Trasedu Media Needs Analysis

Based on Table 1. Information was obtained that the teacher did not know Trasedu media. This shows that the developed Trasedu media can be used as an additional collection of learning media owned by the teacher. From the analysis of the needs of learning media and responses according to the perceptions of the teacher and students mentioned above, it is then used as the basis for making Trasedu media in class IV MI science subjects material for the sense of human hearing.

**Table 1 - The results of the teacher needs analysis questionnaire for trasedu media.**

| Indicator | Answer | % |
|---|---|---|
| Implementation of learning according to KI, KD | Yes | 100 |
| | No | - |
| | Sometimes | - |
| Obstacles in presenting the material | Yes | 66,6 |
| | No | - |
| | Sometimes | 33,3 |
| Forms of learning media | Pictures, Books | - |
| | Augmented Reality | 100 |
| | No need | - |
| Previous use of AR media | Already | - |
| | Not yet | 100 |

The development of learning media for elementary school students from a combination of content in audio and visual formats facilitates the knowledge transfer process (Arif, 2019). Augmented Reality can replace learning modules that do not yet exist in schools in virtual or virtual form so that the level of demand for this media is high (Afifah et al., 2019). Based on the results of the research and the opinions of several experts, it can be concluded that Augmented Reality-based media such as Trasedu media are needed by teachers to support the learning process which can increase student understanding.

The results of the feasibility analysis carried out by validator experts obtained an average of 87% with a very feasible category. The results of the effectiveness test of Trasedu media to increase the understanding of human hearing sensory material using the N-Gain test are included in the effective category, which is equal to 78%..

The effectiveness of learning media in this study is in line with the research results of Saputri & Dian (2017), Qorimah & Sutama (2022) and Imawati & Chamidah (2018) which revealed that the use of Augmented Reality media in the learning process is effective in increasing vocabulary mastery and learning outcomes. Based on the discussion and results of previous research, it can be concluded that the Trasedu media is effectively used to increase the understanding of MI students in KKG MI Sedan District, Rembang Regency. Figure 2 shows a two-dimensional view of Trasedu media.

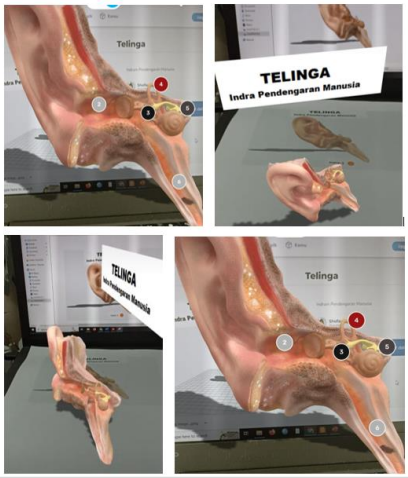



**Fig. 2 - Trasedu media.**

## 5. Conclusions and recommendations

Based on the results of this development research, it can be concluded that Trasedu media is needed in science learning, both by teachers and by fourth grade students to make it easier for them to understand material that they cannot see in real terms. The feasibility level of Trasedu media based on the results of expert validation tests also reached an average of 87% and was included in the very good criteria and the effectiveness of Trasedu media in increasing students' understanding of the material for the sense of human hearing was included in the high category, with an N-gain value of 78%.

Teachers are expected to be creative in developing interactive and interesting learning media for students so as to foster curiosity in students and will ultimately increase students' understanding of the subject matter being studied. Teachers can adapt and modify existing media according to subject matter by utilizing technology-based learning applications that are increasingly familiar to students.

**Acknowledgement**

The authors would like to thank the fellow authors and organizations whose intellectual properties were utilized for this study.

**Conflict of Interest**

The authors declare no conflicts of interest.

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