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Development of STREAM-ETHNO-Based Learning Media for Elementary School Students

Sri Setiawaty[1]*, Riska Imanda[2], Karismayani[3], Wandira Kinanti[4], and Nur Dhihila AT[5]

Faculty of Teacher Training and Education, Malikussaleh University
(Jl.Cot Tengku Nie, North Aceh Regency)
Email: sri.setiawaty@unimal.ac.id

Abstract. The need for virtual media aligns with the Ministry of Education and Culture program. The fulfillment of ICT-based learning facilities, including the need for facilities in learning, must be balanced with the availability of virtual learning media where students and teachers need to be given facilities and support to use and develop learning media according to their needs. Professional teachers not only need to prepare lesson materials but are also required to be creative in using learning approaches and developing learning media. Learning media will facilitate interaction between teachers and students, making learning activities more effective and efficient. This is the main reason researchers integrate STREAM learning based on Aceh's local wisdom in teaching media in the form of learning media using educational software. This study aims to determine the quality of STREAM-Etno learning media. To achieve this goal, this study was designed using a design model based on the ADDIE model for the development stage due to the researcher's limited time. The research stages include preliminary analysis to understand the needs and facilities in implementing virtual technology and learning media development design. Based on the results of the research and development that has been carried out, the STREAM-Etno integrated learning media can be declared valid and feasible, so it is suitable for use in grade III elementary school students, based on the results of expert assessment validation obtained an average percentage of 92.6% in the material aspect and 95% in the media aspect with the category "Very Good."

Keywords: STREAM-Ethno, Learning Media, R&D

1. Introduction

Learning media is an external factor from outside the students to succeed in the learning process (Unaida et al., 2022). One of the learning media is technology-based, where technology in learning is significant to create quality and timely educational processes and results [1]. Augmented reality (AR) is a virtual technology currently being developed in education. This role will be maximized when teachers create and present learning content that stimulates students [2]. Virtual reality is a computer technology that combines particular input and output devices to allow users to interact deeply with virtual environments as if they were real [3]. In line with the objectives of the implementation of LPTK revitalization initiated by the Ministry of Education, Culture, Research, and Technology and implemented at the FKIP of Malikussaleh University,

namely Improving the capability and quality of the Integrated Learning Resource Center for ICT, where the fulfillment of ICT-based learning facilities including virtual reality needs, this must be balanced with the availability of learning media.

The need for virtual media in Education Units is a need that the Ministry of Education and Culture program is focusing on strengthening the quality and capacity of education program implementation. Therefore, teachers need to be facilitated in using and developing learning media according to the school's needs and conditions. The ability of students to represent the level still needs to improve; students have difficulty understanding concepts simultaneously. In addition, teacher-centered learning can make students need to be more active during learning. This aligns with teaching materials that are not available, making learning less than optimal. Therefore, a learning media is used by integrating STREAM-Etno to optimize the representative learning process that has yet to be used by teachers/students. Ethno pedagogy views local knowledge or wisdom as a source of innovation and skills that can be empowered for the welfare of society [4]. The integration of local wisdom in classroom learning has not been maximized; education and local wisdom values have not fully merged into a new, formidable force in Indonesian education. As a result, the impact of education on the preservation of regional culture is still far from expectations [5]. Ethno-oriented education is very important in the world of education. Indonesia is a country with a variety of diversity. In addition, globalization and technological developments can result in cultural changes and shift existing cultures in Indonesia that should be preserved [6]. Therefore, technology integration in local wisdom-based learning practices must be carried out as a manifestation of current technological developments. One of them is the STREAM learning approach.

STEM is an educational curriculum that combines science, technology, engineering, and mathematics. This is intended as learning by integrating disciplines into a cohesive teaching and learning paradigm towards other disciplines into a new learning mode, and the goal is to combine some or all of the STEM elements into each project [7]. Furthermore, adding Reading and Art elements to STREAM (Science, Technology, Reading, Engineering, Arts, and Mathematics) supports increased literacy. In STREAM education, literacy is essential to a comprehensive curriculum because it requires critical thinking and creativity. The STREAM project is similar to STEM or STEAM but consists of reading and writing components [8], [9].

STREAM is essential in thematic learning because various subjects are presented together. This requires students to understand the whole concept as a whole because each concept at one level has an impact on the idea at another level. Therefore, learning that emphasizes presentation at only one of the levels of thematic learning makes it difficult to understand the lesson as a whole. Thus, disciplines must be linked together

so that students understand the concept in a more representative, complete, and accessible way. Furthermore, the purpose of this study is to determine the feasibility of learning media in the form of an integrated learning portal, STREAM-Etno, which is developed for thematic learning in elementary schools.

2. Method

The stages of this research refer to the type of research and development (R&D) with the ADDIE model, which has 5 stages of development [10], with the aim of the research to determine the quality of STREAM-Etno learning media based on Acehnese local wisdom in thematic learning. However, due to the researcher's time constraints and activity budget, this study was only carried out up to stage 3 (development). This research was conducted at FKIP Malikussaleh University and MIN 26 North Aceh as the object of the preliminary study. The data analysis technique is used to assess media quality. The data obtained in the form of qualitative data is converted into quantitative with criteria for the category of ideal assessment scores.

3. Results and Discussion

The development of the integration of STREAM-Ethno learning media refers to the cognitive learning outcomes demands in the Merdeka Curriculum, with the following results.

3.1. Analysis Stage

The analysis stage is the initial step in the research development of the ADDIE model; at this stage, the researcher analyzes problems, needs, and materials through the implementation of observations. The observations show the minimal use of interactive learning media in teaching and learning. Teachers tend to use books available in the library or dictate lesson materials so that learning in the classroom is still teacher-centered, making students bored and less active and innovative during the learning process. Also, the availability and variety of books in the library could be improved. The content/content of the material in the learning media is thematic learning. This material analysis is adjusted to the learning outcomes (CP) in the independent grade III SD/MI curriculum.

3.2. Designing Stage

The design stage is carried out for design before development by planning the outline before developing the product as an initial action to see the students' abilities or readiness for virtual media. Furthermore, the media product is arranged according to the student's needs and criteria regarding the independent curriculum and Aceh's local wisdom. The arranged learning media is named TAMITA and is presented as cards and game boards. Tamita Card is an acronym for 'Tantangan Merangkai Kata.' The word

Tamita comes from the Acehnese language, which means to search. The meaning of searching can be interpreted as choosing or determining. This aligns with the Tamita Card game, which is choosing the right words to be arranged into a sentence with a SPOK pattern (subject, predicate, object, description). The learning media is then integrated with the STREAM-Etno approach (Science, Technology, Reading, Engineering, Arts and Mathematics-Etno).

(a) (b)

Figure 1 (a) Display of learning media, (b) Mascot of learning media

In this educational game, a game mascot is also introduced, designed by considering Aceh's local wisdom, namely "bang Mae" and " kak Rabumah." The mascot 'Bang Mae' is taken from the typical name of the Acehnese people for a man with a good, cheerful, and humorous character. This character will be designed in the form of Rincong (Rencong), representing the traditional weapon of Aceh, and the form of Kupiah Meukutop, which is used to symbolize the signs of life of the Acehnese people based on religion, customs, and education. The mascot 'kak Rabumah' is taken from the name of an Acehnese female character who is cheerful and likes new things.

Next, the media is designed using candy (https://www.educandy.com/) for educational online games. The game series presented has only three levels (Match, Multiple Choice, and Memory) because it is adjusted to the type of TAMITA card game previously designed.

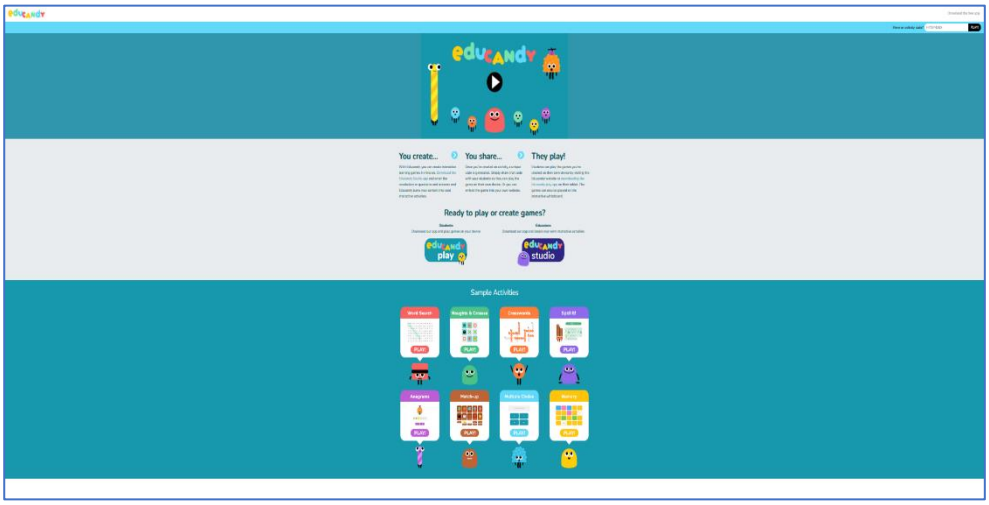

Figure 2 Educandy Software Page View

This learning media can be accessed via the link http://kartutamita.my.id/. It is packaged by paying attention to thematic learning content and learning achievements.

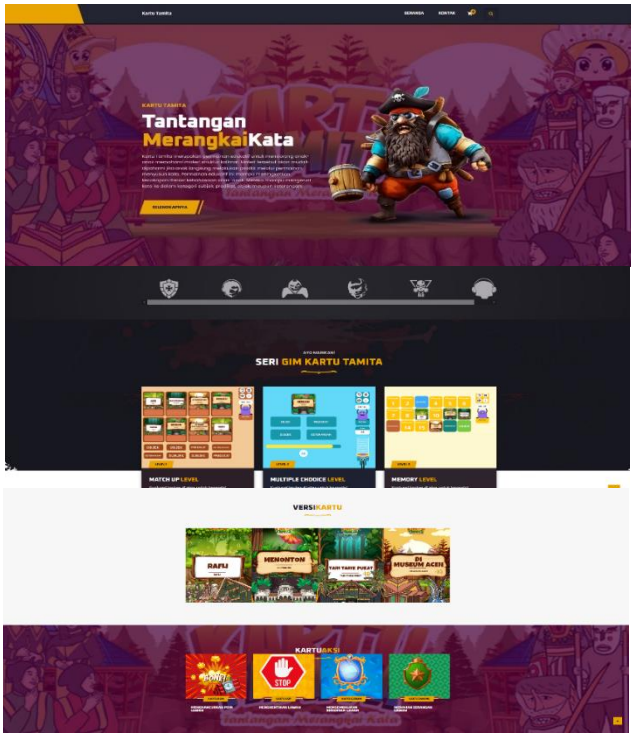

Figure 3 Educational Game Page View

3.3. Development Stage

At this stage, the focus is only on validating and assessing the feasibility of the media product design (expert appraisal). Two expert lecturers carry out validation, namely for media and material/content validation. The validation aims to obtain assessments, criticism, and suggestions so that the media developed can become quality

learning media according to standards. The percentage data of the assessment results obtained from the material and media expert validators are presented in the following graph.

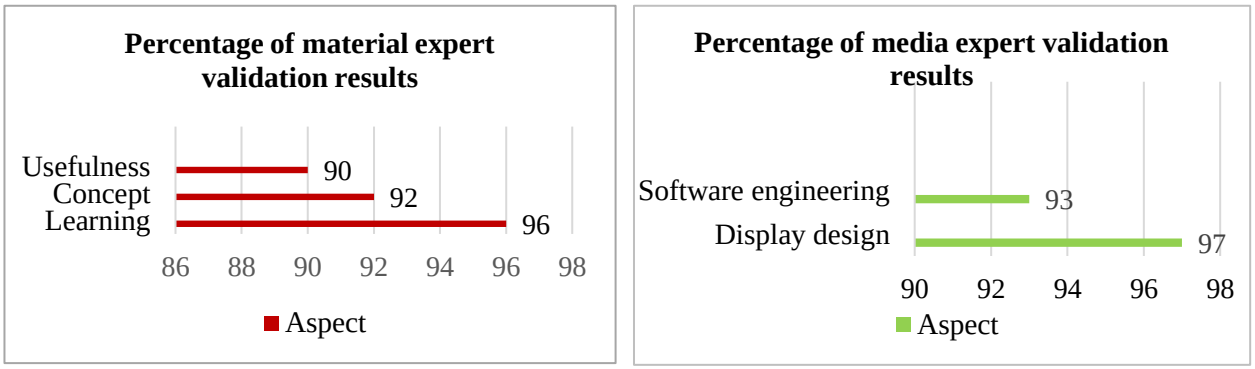

Figure 4 Graph of expert assessment validation results

Based on the expert validation results, the percentage of assessment results from the material content and the appearance of the developed learning media obtained the category of 'very good,' which means that the developed media is valid regarding material content/content and presentation appearance. Futhermore, the learning media based technology is effective in enriching the teaching and learning experience and improve spatial cognition abilities [11], educational apps promotes an active and engaging learning process [12]. The appearance of the TAMITA online card game is presented in the following figure.

(a) (b) (c)

Figure 5 Educational game of learning media, (a) *Level Match Up*, (b) *Level Multiple Chooice*, (c) *Level Memory*

At this validation testing stage, the learning media was also peer-reviewed by class teachers at MIN 26 North Aceh to determine its feasibility.

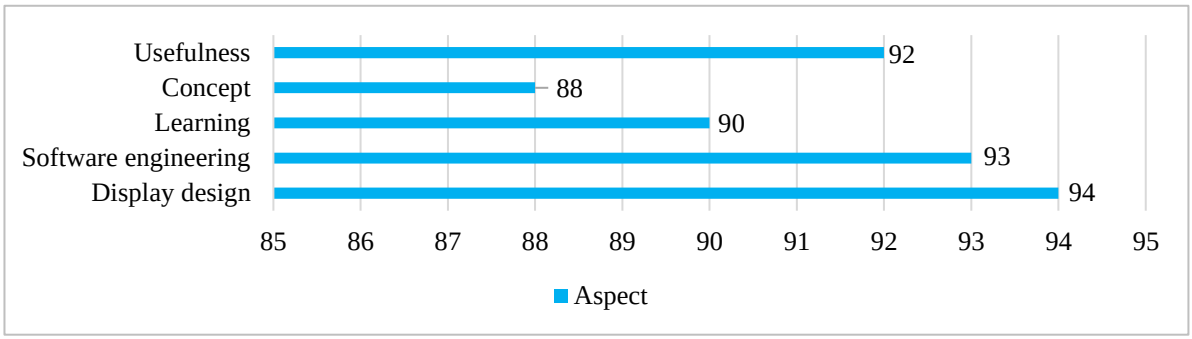

Figure 6 Graph of feasibility test of learning media results

Based on the feasibility test result graph, the developed learning media obtained the category of 'very good' with an average percentage of 91.4, which means that the developed media is feasible and can be disseminated to be used in schools. Furthermore, Setiawaty et al. (2024) in his study showed that learning media combines the virtual world (Augmented Reality), which can increase students' imagination with the natural world directly, improving digital understanding abilities [13]. Therefore, applying the learning environment as a vehicle for learning natural ecosystems is better than using multimedia. Learning with real environmental influence on achievement is more favorable than multimedia [14], [15].

4. Conclusion

Based on the results of the study, it can be concluded that the integrated learning media STREAM-Ethno developed using the ADDIE development model has media quality in terms of expert validation and teacher responses that are included in the qualifications that are very suitable for use as interactive learning media in measuring students' thematic learning outcomes. Furthermore, it is hoped that there will be improvements to the learning media created by researchers by widely optimizing the use of media.

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