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Development of 3D Animated Video Learning Media for Recognizing Alphabet Letters at the At-Taqwa Playgroup in Pajar Bulan Village, Ogan Ilir Regency

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A B S T R A C T

Early childhood education in non-formal playgroups such as At-Taqwa in Pajar Bulan Village, Ogan Ilir Regency, faces challenges in introducing the alphabet due to boring print media even though audiovisual facilities are available, causing low interest in learning and suboptimal literacy development. This study aims to develop valid and practical 3D animated video learning media for introducing the alphabet for early childhood. Using research and development (R&D) with the ADDIE model (analysis, design, development, implementation), a population of 41 children with one-to-one (3 children) and small group (10 children) trial samples. Instruments include a Likert Scale expert validation questionnaire, a Guttman Scale practicality questionnaire, interviews, and observations; data analysis using a percentage formula. The results show high validity (average 90.83%: material 90%, media 87.5%, language 95%) and practicality (100% in both trials). In conclusion, the media is effective in increasing interest in learning and mastery of the alphabet, ready to be implemented in PAUD.

Keywords: *Alphabet Recognition, Animated Video, Early Childhood, Learning Media, Playgroup*

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INTRODUCTION

Early childhood education (PAUD) is a crucial foundation for developing children's character, knowledge, and basic skills through non-formal channels such as playgroups, which emphasize play-based learning for children aged 2–4 years. This non-formal education plays a role in providing structured training tailored to children's needs, supporting holistic physical, emotional, social, and language development (Yulisa et al., 2022)(Choirunnisa et al., 2022). In Indonesia, playgroups such as At-Taqwa in Pajar Bulan Village, Ogan Ilir Regency, target preschool readiness in early childhood through a curriculum that encompasses cognitive, language, motor, arts, and habituation (Syaputra et al., 2023).

Introduction to the alphabet is an essential foundation for early literacy, not only for reading and writing but also for developing children's critical thinking and creativity up to higher education levels. This ability opens access to broad knowledge, facilitates understanding of the environment, and prepares children to face formal academic challenges (Ismawati et al., 2024)(Abdullah et al., 2025). Early stimulation from the age of 2–3 years through interactive media such as animation has been shown to strengthen memory of the shape, sound, and sequence of letters, while also training fine motor skills (Nasution et al., 2024).

In the current era of digitalization, the integration of visual and digital media in early childhood education has been proven effective in enhancing both the quality of learning processes and outcomes. Studies confirm that audiovisual media simultaneously stimulate the visual and auditory senses, making learning more engaging and memorable for young learners compared to conventional print media (Maielfi et al., 2024). Interactive animated

media, in particular, have demonstrated high validity scores (≥90%) and significant improvements in children's developmental achievements, reinforcing their role as effective instructional tools in PAUD contexts. Furthermore, research on 3D animation for early childhood letter recognition has shown that such media can achieve very feasible ratings, addressing the monotony of static learning props commonly found in non-formal settings.

Problems arose at the At-Taqwa Playgroup, where initial observations showed children struggling to distinguish letters, remember sequences, and pronounce them correctly when taught collaboratively using conventional print media. Interviews with the principal and parents revealed low interest in learning due to the boring media, although audiovisual facilities such as projectors were available but rarely used (Rodhiyana, 2024)(Mukhlasin, 2021). Children were often silent or did not follow instructions, resulting in suboptimal early literacy and a lack of learning variation (Hilali, 2025).

The lack of interactive audiovisual media exacerbates the situation, as young children are more responsive to engaging visual-audio stimulation than static media. A questionnaire survey of 41 children showed that 78% felt bored, while 100% preferred animated videos to increase interest and understanding (Perdana & Rocmah, 2024)(Andriyani et al., 2021). Preliminary research confirms the need for media such as 3D animated videos to address this limitation, given that 75% of learning experiences are visual (Maielfi et al., 2024).

Despite the growing body of research on animated media in early childhood education, a significant research gap remains: the majority of existing studies focus on 2D animation or are conducted in formal kindergarten (TK) settings in urban areas, with very limited attention given to the use of 3D animated video in non-formal PAUD settings such as rural playgroups (KB) (Agustina et al., 2022)(Abdullah et al., 2025). Studies specifically targeting playgroups in remote or semi-rural regions like Ogan Ilir Regency are virtually absent from the literature, leaving a critical void in understanding how 3D animated media can address literacy challenges in such underserved contexts.

This study aims to develop valid and practical 3D animated video learning media for alphabet recognition in At-Taqwa Playgroup. The **novelty** of this research lies in two dimensions: first, it is the first study to develop and validate a 3D animated video—produced using Autodesk 3ds Max and Adobe After Effects—specifically for alphabet recognition in a non-formal playgroup (KB) environment in rural Ogan Ilir, South Sumatra; second, it addresses a context where technology infrastructure exists but remains underutilized, offering a replicable model for similar PAUD institutions in remote Indonesian regions. This study thus complements and extends previous works that were limited to 2D animation or formal early childhood settings (Agustina et al., 2022)(Abdullah et al., 2025).

METHOD

This research employs a Research and Development (R&D) approach, defined as a systematic process to create or improve educational products that meet specific learning needs (Sugiyono, 2021). The goal is to produce a 3D animated video learning media product for alphabet recognition targeted at early childhood at the At-Taqwa Playgroup in Pajar Bulan Village, Ogan Ilir Regency. The development framework adopts the ADDIE model—comprising five stages of Analysis, Design, Development, Implementation, and Evaluation—which is recognized as a systematic and flexible approach widely used in educational media development (Fatimah et al., 2022). However, only four stages (Analysis, Design, Development, and Implementation) were applied in this study, as the primary focus was on establishing the validity and practicality of the developed product rather than conducting a comprehensive summative evaluation. This decision aligns with Sugiyono's (2021) emphasis on iterative R&D stages to address the "need to do" problems in educational practice, as well as Creswell's (2021) step-by-step framework for educational R&D design.

Population and Sample

The study population comprised 41 early childhood children enrolled at the At-Taqwa Playgroup in Pajar Bulan Village, Ogan Ilir Regency. Sampling was conducted in two phases

for product trial purposes: a one-to-one trial involving 3 children selected randomly, and a small group trial involving 10 children selected randomly. The sampling technique used was purposive sampling, selected based on the specific characteristics of early childhood learners to ensure the sample was representative and relevant to the research objectives, in accordance with the approach proposed by Sudaryono et al. (2013, as cited in 2021 contexts) for developing representative educational research instruments.

Research Instruments

Three types of instruments were used in this study to collect data comprehensively:

Expert Validation Questionnaire – using a Likert Scale to assess product validity across three domains: material content, media design, and language use.

Practicality Questionnaire – using a Guttman Scale administered to children during product trials to measure the practical usability of the media.

Interview and Observation Guidelines – open-ended interviews were conducted with the school principal and teachers, while participant observation was used to assess children's learning activities and interactions in the classroom.

Data Collection Techniques

Data were collected through three complementary techniques: (1) direct participant observation of teaching and learning activities at the At-Taqwa Playgroup; (2) structured and open-ended interviews with the principal and classroom teachers to identify learning challenges and infrastructure conditions; and (3) a needs analysis questionnaire distributed to all 41 children (with teacher assistance) to explore preferences and requirements for animated video-based learning media.

Data Analysis

Data were analyzed using percentage formulas appropriate to each instrument type, following Sugiyono's (2021) guidelines for interpreting Likert and Guttman scale responses. For expert validation, the validity categories were defined as: very valid (≥81%), valid (61–80%), less valid (41–60%), and invalid (≤40%). For practicality testing, the categories were: very practical (76–100%), practical (51–75%), less practical (26–50%), and impractical (≤25%). Qualitative data from interviews and observations were used to triangulate and support the quantitative findings.

Research Procedure

The research procedure followed four sequential stages of the ADDIE model:

Analysis – conducted through classroom observation, teacher interviews, and a needs questionnaire to identify learning problems, children's characteristics, and available facilities.

Design – involved the preparation of a video script, learning flowchart, and selection of development software (Autodesk 3ds Max and Adobe After Effects), with content designed around letter-object associations and alphabet songs.

Development – encompassed the production of the 3D animated video, followed by expert validation from material, media, and language experts, yielding an average validity score of 90.83% (categorized as Very Valid).

Implementation – involved two rounds of product trials: a one-to-one trial (3 children) and a small group trial (10 children), both yielding a practicality score of 100% (categorized as Very Practical).

This procedural flow is consistent with Emzir's (2010) framework for logical quantitative-qualitative educational methodology, as applied in recent studies (2021–2025), ensuring both rigor and contextual relevance in the development process.

FINDINGS AND DISCUSSION

This research resulted in a product developed in the form of a 3D animated video-based learning media that discusses the introduction of letters of the alphabet, aimed at children at the At-Taqwa Playgroup in Pajar Bulan Village, Ogan Ilir Regency. In developing this learning media, the researcher used the ADDIE model, which consists of 5 (five) stages: analysis, design, development, implementation, and evaluation (Fatimah, et al., 2022). In this study, only four stages were used because the main focus was to create or develop a new, valid and practical product, not to measure the overall success of the implementation. The four stages are analysis, design, development, and implementation.

Analysis Step

The initial stage was a needs analysis through direct observation to assess students' learning abilities, the extent to which language was used when communicating with peers and teachers, and students' interactions with their surroundings. Observation results indicated that students and teachers at the At-Taqwa Playgroup in Pajar Bulan Village used regional languages and Indonesian as communication tools. Students frequently used print media in their teaching and learning activities. Students rarely used electronic learning media such as animated videos, and some children appeared bored with the media presented during their learning.

At this stage, an interview was also conducted with one of the educators at the At-Taqwa Playgroup. This open interview activity aims to identify problems and analyze the needs of the At-Taqwa Playgroup. Based on the results of the interview conducted with one of the teachers at the At-Taqwa Playgroup, Mrs. AD, aged 29, it was found that even though they already have technology-based facilities, in the learning process the teacher rarely uses technology-based learning media. In teaching and learning activities, teachers also face problems such as a lack of other facilities, limited time, and the difficulty of presenting material with existing media. This condition makes the variety of materials provided limited, thus impacting the children's learning interests, some feel happy and some feel bored. Therefore, additional media is needed that combine elements of sound and moving images such as learning videos, especially regarding the introduction of letters of the alphabet to help children remember, recognize letter shapes and letter sounds, distinguish letters, and pronounce letters of the alphabet so that they are no longer confused and can also increase the effectiveness of teaching and learning in schools.

Furthermore, the researcher also analyzed the students' needs by using a questionnaire filled out by all students in the At-Taqwa Playgroup, totaling 41 children with teacher assistance. The questionnaire was filled out directly with the aim of exploring the students' needs for animated video-based learning media related to the introduction of alphabet letters. This analysis is important to be implemented in the At-Taqwa Playgroup as an effective learning tool. From the results of filling out this questionnaire, it can be seen that as many as 78.05% (32) of students feel bored with the current learning media, 100% (41) of students like to see pictures or videos, 100% (41) of students like to learn while watching videos, 100% (41) of students stated that animated videos make learning more fun, 100% (41) of students stated that animated videos can increase interest in learning. Furthermore, 90.24% (37) students easily understand video-based lessons, 100% or 41 students have learned about alphabet recognition, 41.46% (17) students have learned material about video-based alphabet recognition, 100% (41) students are happy if there is a video that teaches about alphabet recognition, 100% (41) students in the At-Taqwa Playgroup agree if there is animated video learning media about alphabet recognition. From these data, it can be concluded that students in the At-Taqwa Playgroup feel bored with the existing learning media so they need video-based learning media sources that discuss alphabet recognition for early childhood.

Design Stage

In the process of designing an animated video, the design stage includes the preparation of a video script and product design (software selection). Based on the results of the data obtained from the analysis stage, researchers will develop animated video-based

learning media designed by considering learning objectives. This learning media will be arranged in a format that will be adjusted to the needs of students, namely with animated videos that have a duration of more than 5 minutes. The content of the learning material includes the introduction of sounds and letter shapes through object associations, as well as repeating the pronunciation of letters of the alphabet and objects by singing. The concept design of the learning media will be represented in the form of a Flowchart. In addition to determiningdesign of animated video media content that will be produced, researchers alsoPrepare objects that correspond to the letters of the alphabet. Each letter is represented by a single object. These objects are then used as material for creating a 3D animated video. This is followed by creating the content of the previously designed 3D animated video script. The video editing software used in creating this animated video is Autodesk 3ds Max and Adobe After Effects.

Development Stage

The development stage is the production stage of the product design that has been prepared. The initial step in development is carried out by developing a 3D animation video that aims to produce a product. At this stage, the product developed by the researcher is a learning media in the form of 3D animation that raises the theme of recognizing letters of the alphabet for early childhood at the At-Taqwa Playgroup, Pajar Bulan Village. The results of the development of learning media in the form of videos carried out by the researcher can be seen as follows: the character of the teacher is the main character in the 3D animation video. This character is depicted by a teacher who explains the material from the 3D animation video. The material in the video includes recognizing letters of the alphabet through songs, and recognizing sounds and shapes of letters with object associations. In the 3D animation video recognizing letters of the alphabet, the background used depicts several rooms in the classroom, including in front of the blackboard and near the window, as well as natural scenery. The material in the 3D animation video delivered consists of two types, namely material presented through characters or stories, including singing, and mentioning letters of the alphabet with their object associations, and material delivered through text, including text of letters of the alphabet. The title of this 3D animated video is "Getting to Know the Alphabet," and the video concludes with a closing sentence delivered by a character. Voice-overs were provided to add voices to the characters, adapting the script to the video. One voice type is provided by the speaker, the voice of the teacher.

After the product was completed, validation or validity testing was carried out by experts. The validation carried out by material experts obtained a percentage score of 90% which is in the "Very Valid" category. Material experts provided suggestions and criticisms regarding the product, related to the learning objectives in points 1 & 2. The conclusion from the assessment carried out by material experts showed that the product was valid for testing after improvements were made. Meanwhile, media experts obtained a percentage score of 87.5% which is in the "Very Valid" category. ". The material expert provided suggestions and criticisms regarding the product, including regarding the character's clothing, the sentences delivered by the character and the character's voice, the addition of place recognition, the opening section (singing) improved transitions between letters as well as the background and shape of the letters, images of objects that are appropriate and easy for children to recognize (C, D, F, I, J, K, N, & W). The background color when repeating the mention of letters and objects by singing and adding the display of images of letters and objects. The conclusion of the assessment carried out by the media expert shows that the product is valid for testing after improvements. And the language expert got a percentage score of 95% which is in the "Very Valid" category. The language expert did not provide criticism and suggestions regarding the product, because the 3D animated video learning media product to recognize the letters of the alphabet is valid for testing without improvements. Based on data obtained from 3 validators, the average percentage of validation results from the experts was 90.83% with the "Very Valid" category. The results of this validation process will be used as a guideline for making product

improvements, so that it can produce a learning media product in the form of an animated video about letter recognition valid alphabet to perform the test.

Implementation stage

In this stage, product testing is divided into two types, namely individual trials (one to one), and small group trials (small group). In the individual trial stage, researchers involved 3 early childhood children selected randomly to watch an animated video with the guidance of a teacher/researcher. After each child watched the video, then continued with filling out a practicality questionnaire. Where when filling out this practicality trial questionnaire, the children were accompanied directly by a teacher who teaches at KB Aq-Taqwa. Based on the results of the individual trial, a percentage score of 100% was obtained with the category "Very Practical". And in the small group trial stage, researchers involved 10 early childhood children to try the product in the form of an animated video that had been developed. At this stage, first, 10 early childhood children were selected randomly to watch the video. After the children watched the video in a small group, they then filled out a practicality trial questionnaire accompanied by a teacher. The results of the practicality trial of this product got a percentage score of 100% and was included in the category "Very Practical".

Discussion

This research is a type of product-oriented research and development (R&D) and aims to develop an animated video media to recognize the alphabet for early childhood at the At-Taqwa Playgroup in Pajar Bulan Village, Ogan Ilir Regency. The research and development method is a process or stages to create a new product or improve an existing product (Okpratrika, 2023). According to Fatimah, et al., (2022) the ADDIE model consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model is a general learning model and is suitable for use in development research.

The results of this study indicate that the animated video learning media for recognizing letters of the alphabet developed through the ADDIE method is declared very valid, with an average validation score of 90.83%. Validation from material experts, media experts, and language experts shows that this media has met the eligibility standards in terms of material content, visual appearance, and language. The animated video created displays all letters of the alphabet from letter AZ with an attractive visual design, clear sound, and a display adapted to the characteristics of early childhood. The language used in the video is designed to be simple so that it is easily understood by early childhood, and in accordance with the principles of Playgroup (KB) learning which emphasizes elements of learning while playing and having fun.

The media's validity confirms that the development was on target and supports the stated objective, which is to improve early childhood alphabet recognition skills. The validation results also demonstrate that this media is not only suitable for use but also has practical benefits in everyday learning by increasing interest, capturing attention, facilitating understanding, and providing a fun learning experience for children.

When compared with previous research, the results of this study are in line with the findings of Mailfi, et al., (2024) which showed that the use of animated videos in the learning process is considered more effective because it can stimulate two human senses simultaneously, namely the sense of sight (eyes) and the sense of hearing (ears). This is reinforced by Mufidah in Mailfi, et al., (2024) who explained that approximately 75% of a person's learning experience is obtained through the sense of sight, while approximately 13% through the sense of hearing and the rest comes from other human senses. In addition, the results of this study are also supported by Agustina, et al., (2022) who emphasized that animated videos can help attract interest in learning, increase motivation, clarify the material being studied, and improve student learning outcomes. Dhida's opinion (2021) is also in line, that the use of learning media in the form of animated videos in the learning process can increase the attraction and enthusiasm for learning, while creating a more enjoyable learning experience. Overall, these four studies confirm that the use of animated video media can

enhance and improve the quality of student learning, both in terms of understanding and involvement in the learning process.

Thus, the results of this study not only align with previous findings but also provide a new contribution in the form of a validated animated video product that has been directly tested in a Playgroup environment. The developed media has been proven valid and appropriate to the needs of students, and reinforces the success of the ADDIE model as an appropriate development approach in Early Childhood Education (PAUD).

CONCLUSION

This research successfully developed a 3D animated video learning media for alphabet recognition which was declared very valid with an average score of 90.83% from the validation of material experts (90%), media (87.5%), and language (95%), and was very practical with the results of one-to-one and small group trials reaching 100%. The main findings showed that this media was effective in overcoming boredom in early childhood at At-Taqwa Playgroup, where 78% of children felt bored with conventional print media, while 100% liked animations that stimulated vision and hearing to strengthen memory of shapes, sounds, and the order of letters AZ through songs and object associations. However, the limitation of the research lies in the focus on only four ADDIE stages (analysis, design, development, implementation) without a thorough evaluation, so it has not measured the increase in long-term literacy skills after full implementation. The practical implications are that this media is ready to be implemented by non-formal early childhood education (PAUD) teachers to increase learning interest and preschool readiness in rural areas such as Ogan Ilir, with a simple design using Autodesk 3ds Max and Adobe After Effects that can be replicated. Suggestions for further research include testing long-term effects on reading and writing skills through a quasi-experimental design with a control group, expanding to multilingual animations for bilingual Indonesian contexts, and integrating gamification elements to measure letter retention in a larger sample. This approach will enrich the development of inclusive and evidence-based PAUD media.

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