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DEVELOPMENT OF DIGITAL MEDIA BASED ON VISUAL NOVEL (PROS-VN) TO IMPROVE PROSOCIAL BEHAVIOR IN EARLY CHILDHOOD

DADAN NUGRAHA[1], FASLI JALAL[2], SOFIA HARTANTI[3]

[1]Postgraduate Program, Universitas Negeri Jakarta, Jakarta, Indonesia

[2] Postgraduate Program, Universitas Negeri Jakarta, Jakarta, Indonesia

[3] Postgraduate Program, Universitas Negeri Jakarta, Jakarta, Indonesia

E-mail: [1]dadannugraha_9920917007@mhs.unj.ac.id, [2]faslijalal@yahoo.com, [3]sofihartati@unj.ac.id

ABSTRACT

One of the most important aspects of development for early childhood is the aspect of prosocial behavior. Several media are needed to improve this aspect of development, including digital-based media. emotional. Based on that, this research aims to develop media based on digital visual novels to improve prosocial behavior in early childhood. The ADDIE model with 5 main stages namely Analyze, Design, Develop, Implement, and Evaluate and the subject is children aged 5-6 years. Through observe Research data can be obtained and analyzed through observation, interviews, and documentation with the N-gain score analysis technique application as a digital innovation product in this study in the form of early childhood education media designed to be used on computers with the Android operating system. PROS-VN is a digital-based game application to improve early childhood prosocial behavior that focuses on narrative. PROS-VN digital media is effective in increasing prosocial behavior in early childhood. Researchers and developers of early childhood education media should focus more on aspects of developing children's potential so that every aspect that is stimulated through digital media can be utilized in their lives in the future.

Keywords: *Mathematical Digital Media, Visual Novel, Prosocial Behavior*

1. INTRODUCTION

Prosocial behavior is defined as an aspect of social skills that begins to emerge and develop in early childhood. Prosocial behavior is an action intended to help or benefit other people or groups of people voluntarily without expecting external rewards [1]. Researchers use the term prosocial behavior, namely helping, sharing, and other positive behaviors that appear to be intentional and voluntary and can have unspecified, unknown, or non-altruistic motives [2]. Proposal behavior is defined as a voluntary action intended to help or benefit other people or groups of individuals [2].

Prosocial behavior refers to voluntary actions aimed at benefiting others such as sharing, donating, caring, and entertaining [3]. Prosocial behavior is the behavior of voluntarily giving kindness to others such as helping, sharing, entertaining, and collaborating [4]. Prosocial behavior is an act that is carried out consciously and voluntarily to benefit others through empathy, cooperation, mutual help, and sharing [5].

Cooperation includes a variety of prosocial behaviors including taking turns, taking turns using toys, equipment, and activities, fulfilling requests, coordinating actions to achieve goals, accepting other people's ideas, negotiating, and compromising in play [6]. In addition [7] defines that prosocial behavior is in the form of sharing, collaborating, and helping each other. Sharing is one of the most important prosocial skills for young children because this behavior occurs most often in the classroom. This is understandable considering the many opportunities that children in a group have to learn from each other. Sharing is characterized by children giving their possessions to others [6]. This prosocial behavior will continue into elementary school [8].

Prosocial behavior is defined as individual actions to help others, often without direct benefit to the helper [9]. This behavior provides direct benefits to others [10], conflicts with one's selfish interests, and can potentially provide results for others [11]. Prosocial behavior is also defined as a voluntary attitude, intentional action, or providing positive or beneficial results for the recipient, regardless of

whether the action has a price value, does not have any impact, or is even beneficial to the giver [12].

There are many studies on prosocial behavior associated with the role of the media [13]; [14]; [15]; [16]. However, children and adolescents [13]; [14]; [17]; [18] have always been the group chosen by researchers in studies related to prosocial behavior. According to [15] based on social cognitive theory, children who are affected by prosocial models and educational media content tend to be influenced by prosocial behavior when they interact with their friends. Meanwhile, [13] said that researchers who focus on prosocial learning through media often assume that media characters that show kindness, cooperation, responsibility, and selflessness also provide examples for children in learning and imitating behavior. the.

The role of the media in prosocial behavior research includes television media, films, music, video games, storybooks, digital modules, and digital storytelling [19]. Research on prosocial behavior using film and cartoon media is based on multiple regression tests, film exposure and observational learning are the main predictor factors contributing to prosocial behavior by 28.3 percent [20]. Multidimensional studies related to prosocial behavior in Disney animated films [21] and the effect of prosocial cartoon models on aggressive cognition and aggressive behavior [22]. Research on prosocial behavior with music media results that music with prosocial lyrics can influence prosocial behavior in everyday life [23]. Listening to songs with prosocial lyrics increases prosocial accessibility, and more interpersonal empathy, and encourages helping behavior [24]. Listening to songs with prosocial lyrics increases helping behavior mediated by interpersonal empathy [25] Music with prosocial lyrics can reduce aggressiveness [26]; Music with prosocial lyrics has a significant impact on tipping behavior in restaurants [27]; Music with prosocial lyrics reduces aggressive thoughts [28] and the analysis results of rap songs contain more prosocial content on social media such as Facebook than on billboards [29].

Research with video game media results of his research shows that violent video games are causal factors for increased aggressive behavior while empathy and prosocial behavior decreased [30]. Children and adolescents who play prosocial games behave more prosocially [17]; The impact of either aggressive or prosocial video games depends on the video game being played [31]; Violent and non-violent video games certainly produce different effects on aggressive and prosocial behavior [32]; Prosocial video games increase prosocial behavior [33]; Playing prosocial video games increases the accessibility of prosocial minds [34]; Playing prosocial video games reduces aggressive behavior [35]; Playing relaxed video games can increase prosocial behavior and reduce aggressive behavior [36]; Not all video games have negative effects, but they can also improve prosocial behavior, cognitive development, and even health, depending on the type of video game played [37]; The electrophysiology of prosocial gameplay can reduce aggressive behavior [38]. Increasing children's prosocial behavior after using the adventure cooking educational game [39]. Research on prosocial behavior with other media, namely pic-pop storybooks based on local Palembang culture, can increase prosocial behavior in early childhood [5]. Storytelling methods based on wayang media influence prosocial behavior in early childhood [40].

Previous research on prosocial behavior using multiple media has focused on television shows and content, movies, music, and video games. While this research focuses on the development of visual novel-based digital media to develop prosocial behavior in early childhood. Research on digital media in early childhood education program results states that the digital-based school environment stimulates the development of social skills [41]. The quality of media used in early childhood education can measure aspects of child development [42]. Digital media can be utilized by parents in facilitating children's play at home [43]–[47].

The visual novel is a very popular and well-known narrative-focused game genre originating from Japan [48]–[52]. Visual novels are games that focus on digital narratives that require interaction where players can influence story development [48]. Its popularity is further strengthened by the rise of free visual novel games such as Ren'Py [53] and their easy and beginner-friendly creation [48] Because it can now be used by academics such as education [54]; [55]; [56]; [51]; [57]; [58]; [59]; [60]; [52] and health [61]; [62]. Visual novel-based research includes "Kinder Learns", a visual novel-based game that can increase preschool students' knowledge [63]. Game design based on visual novels as a medium for early childhood education [64]. Based on this, the focus of this research is "Development of Visual Novel-Based Digital Media to Improve Early Childhood Prosocial Behavior".

From the description of the literature review, the purpose of this research is to develop media based on digital visual novels to improve prosocial behavior in early childhood. The formulation of the problem posed in this research is how to develop digital-based

visual novel media to increase prosocial behavior in early childhood.

3. RESEARCH METHODS

The method used is the research and development of the ADDIE model. ADDIE is an acronym for Analyze, Design, Develop, Implement, and Evaluate. ADDIE is a product development concept. The ADDIE concept is being applied here for constructing performance-based learning. The educational philosophy for this application of ADDIE is that learning intentions should be student-centered, innovative, authentic, and inspirational [65]. Based on this, the research procedures are 1) Analysis of the needs for the development of PROS-VN digital media; 2) Design and development of PROS-VN digital media 3) Implementation of PROS-VN digital media, and 4) Evaluation of PROS-VN digital media.

The research subjects were children aged 5-6 years at the Early Childhood Education level in the East Priangan region of West Java. The reason is that based on a needs analysis, early childhood education program institutions that most need digital-based media to improve children's prosocial behavior after 5-6 years are in the West Java region, especially East Priangan which consists of Garut Regency, Tasikmalaya Regency, Tasikmalaya City, Ciamis Regency, Banjar City, and Pangandaran Regency. This research was conducted from January 2022 to March 2023.

Data collection techniques through observation, interviews, and documentation, while quantitative data analysis techniques using N-gain scores by calculating the difference between pretest and posttest scores and qualitative data related to the description of information on the results of observations, interviews, documentation and validation of software engineering experts, early childhood education program media expert and practitioner expert.

4. RESULTS AND DISCUSSION

4.1 PROS-VN Development

4.1.1 Analysis of needs for digital media development PROS-VN

Analysis of the needs for the development of PROS-VN digital media includes 1) Based on literature studies that playing prosocial video games can increase the accessibility of prosocial thoughts [34]; playing relaxed video games can increase prosocial behavior and reduce aggressive behavior [36]; not all video games have a negative effect, but they can also increase prosocial behavior [37]. 2) based on needs in early childhood education program institutions, it shows that digital media is most needed, namely for aspects of socio-emotional development [19]; 3) based on comparative studies showing that games to improve prosocial behavior are played by more than one child but too many tools and materials/features are used [66] and visual novel games designed have not focused on improving prosocial behavior, but to improve children's math, language, art, social in two modes (adventure and classic) played by one person [67].

4.1.2 PROS-VN digital media design

At this stage, designing flow chat and storyboards or application content scripts. The Information Architecture flowchart is used as a guide for the programming team in creating game mechanics. Flowchart User flow is used as a guide for game designers in creating storyboards.

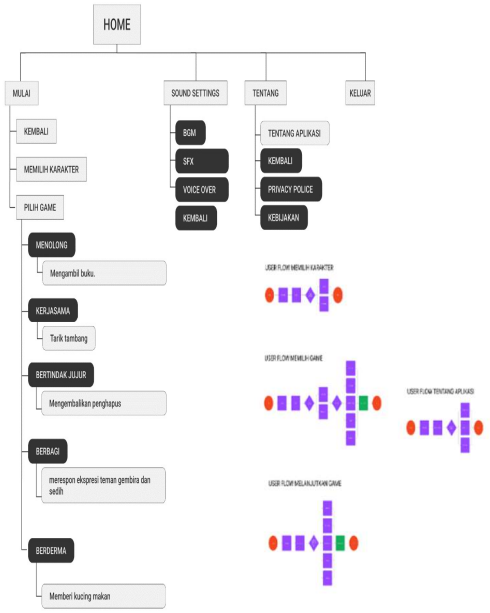

Figure 1: Flowchart Information Architecture & Flowchart User Flow

4.1.3 Digital media development

At this stage, namely the pre-production stage and the production stage. The pre-production stage consists of selecting colors, models, iconography, buttons, logos, and typography. The production stage is in collaboration with several computer software engineering development experts including Game 2D Artists, Game Designers, Game Programmers, and Game Managers. The PROS-VN application was validated (expert judgment) by 3 heterogeneous experts based on their respective expertise. This stage is carried out to obtain

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appropriate input on the feasibility of the PROS-VN application before direct trials are carried out in early childhood (5-6 years). The 3 experts are software engineering experts, early childhood education media experts, and early childhood education program practitioners.

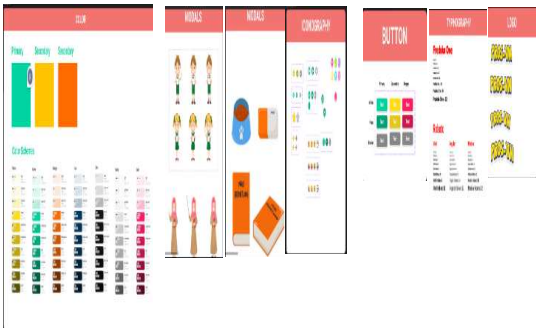

Figure 2: Selection of Colors, Models, Iconography, Buttons, Logos, Typography

4.1.4 Digital media implementation

The implementation phase is carried out through one-to-one, small-group, and large-scale trials. One-to-one activities are carried out to find out children's perceptions and interests in PROS-VN digital media. The results of the one-to-one trial included 1) The children were enthusiastic when the teacher introduced the PROS-VN application as today's play activity; 2) The child dares to be active in reciting material accompanied by pictures on the PROS-VN application; 3) Children carefully pay attention to the images and sounds on each PROS-VN application material; 4) Children can use the PROS-VN application on their smartphones that have been prepared.

The small group activity aims to find out whether the digital media of the PROS-VN application can be understood by users (Children and Teachers). The results of the small group trials included 1) The children were enthusiastic when the teacher introduced the PROS-VN application as today's play activity; 2) The child dares to be active in reciting material accompanied by pictures on the PROS-VN application; 3) Children can imitate saying words/sentences in the PROS-VN application 4) Children carefully pay attention to the pictures and sounds in each PROS-VN application material; 5) The child can try again if there is an incorrect answer; 6) Children can tell their experiences following the material being studied; 7) Children can use the PROS-VN application on their own prepared smartphone; and 8) in general the duration of using the application for each sub-material is proportional so that children are not bored using the PROS-VN application.

The large group test activities refer to 18 indicators of early childhood prosocial behavior including: 1) Children's behavior helps their friends when studying; 2) The behavior of children helping their friends when playing; 3) Child's behavior when helping without being asked; 4) Child's behavior when helping strangers; 5) Children's behavior when their friends are happy; 6) Child's behavior when a friend is sad; 7) Children's behavior when giving in the form of feelings; 8) Child's behavior when receiving in the form of feelings; 9) Children's behavior when doing activities together in play; 10) Children's behavior when carrying out joint activities in learning; 11) Responsible behavior of children in completing joint tasks; 12) Children's behavior when helping each other and helping in a team; 13) Children's behavior when they say what it is without making it up; 14) Child's behavior when not lying or manipulating facts/information; 15) Children's behavior not to cheat; 16) Children's behavior when they dare to admit mistakes; 17) The behavior of children when they are willing to give some of the things they have; and 18) The child's behavior when willing to give some of the food he has.

Figure 3: PROS-VN Application

4.1.5 Evaluation of digital media PROS-VN

The evaluation stage of the PROS-VN digital media is to test the effectiveness using the N-gain score. The aim is to determine the effectiveness of using the PROS-VN digital media application to improve early childhood prosocial behavior. The N-gain score is done by calculating the difference between the pretest and posttest scores. The results of calculating the N-gain score obtained a value of 0.78 or 78%. Referring to the N-gain score effectiveness table, the value is in the high/effective category. The conclusion is that PROS-VN digital media is effective in increasing prosocial behavior in early childhood.

4.2 PROS-VN Media and Its Impact on Prosocial Behavior

4.2.1 PROS-VN digital media

PROS-VN digital media was developed in the context of facilitating education in the industrial revolution era 4.0 which must remain based on the educational function, namely the function of conservation related to local wisdom values of regional culture and the function of innovation, namely according to the needs of the times [68], [69], as well implementation of 21st-century learning related to ease of accessibility to digital-based learning resources and media to meet the various needs of students [70] who have changed from traditional approaches to digital-based learning approaches [71]. This is also in line with what was conveyed by [72]; related to the need for the development of digital media for early childhood.

The digital media developed in this research is based on visual novels. The visual novel as a game genre that focuses on narrative and is very popular and well-known comes from Japan [48], [50]–[52]. Visual novels can now be used by academics such as education [54]; [55]; [56]; [51]; [60]; [58]; [59]; [57]; [52] and health [61]; [62].

The PROS-VN application is a digital innovation product in the form of early childhood education media designed to be used on computers with the Android operating system. Because of this, it has been said that it is appropriate that the world is in the hands of every human being who owns a smartphone/computer with an Android system. This is in line with the opinion [73] that Android is a computer operating system that can be used as an educational medium today. This condition is under research data related to the attitude of children when testing the PROS-VN application who are enthusiastic and actively learn to use the application. Based on this study, it can be interpreted that the innovative product in the form of the PROS-VN application designed in this study is feasible to be applied in early childhood education. The advantages of the PROS-VN application are 1) easy to use for early childhood 5-6 years; 2) the game application is simple so that it is child friendly; 3) as an alternative digital media that can be used in the learning process in early childhood education program. The drawbacks are 1) the material contained in the application is only one aspect of child development, namely prosocial behavior; 2) user objects are only for children aged 5 – 6 years; 3) the application can only be accessed by Android-based smartphones.

4.2.2 Early childhood prosocial behavior

Based on the results of field tests, it can be described that the PROS-VN digital media that has been developed is effective in increasing early childhood prosocial behavior. PROS-VN is an interactive digital game media in the framework of facilitating early childhood education, especially in the effectiveness of increasing prosocial behavior in early childhood. This is consistent with [34] that playing prosocial video games can increase the accessibility of prosocial thoughts. Also supported by [36] that playing relaxed video games can increase prosocial behavior and reduce aggressive behavior. Because not all video games have a negative effect, but they can also increase prosocial behavior [37].

The application of the PROS-VN application is evidenced by the intensity of the emergence of prosocial behavior in early childhood such as helping, cooperation, honesty, sharing, and giving. This is following the statement that prosocial behavior in early childhood is one aspect of social skills that begins to emerge and develops in early childhood in the form of voluntary actions such as sharing, donating, caring, and entertaining [3] helping, sharing, entertaining, and cooperate [4] empathy, cooperation, mutual help and sharing [5] cooperation includes a variety of prosocial behaviors including taking turns, taking turns using toys, equipment, and activities, fulfilling requests, coordinating actions to achieve goals, accept other people's ideas, negotiate and compromise in play [6] share, cooperate and help each other [7]. Based on the above studies related to the relevance of the effectiveness of PROS-VN digital media to the theory of experts, it can be interpreted that the PROS-VN application developed in this study is effectively applied in improving early childhood prosocial behavior.

Overall, the results of this study inform that PROS-VN digital media is appropriate for use as a medium for early childhood learning, and has proven effective for increasing the prosocial of early childhood at the age of 5-6 years. The development of this media is a challenge that must be faced by every educator in schools and tertiary institutions. Therefore, the development of similar media is needed again with a deeper and better presentation as a solution to the lack of digital media.

5. CONCLUSION

The process of developing PROS-VN digital media to improve the prosocial behavior of children aged 5-6 years is carried out using the ADDIE model

steps and descriptions of media displays that are relevant to be applied at the early childhood education level. The PROS-VN application is a digital innovation product in the form of early childhood education media designed to be used on computers with the Android operating system. PROS-VN digital media to improve early childhood prosocial behavior is feasible to use based on the results of the due diligence through the expert/expert testing process. PROS-VN digital media to improve early childhood prosocial behavior is effectively used based on the results of field trial data analysis. This effectiveness value indicates that the PROS-VN application is a research finding which is stated to be effectively applied as an educational medium to improve prosocial behavior in early childhood aged 5-6 years.

Based on the results of the research that has been presented regarding the development of PROS-VN digital media to improve prosocial behavior in early childhood aged 5-6 years, the recommendation is that educators can use the PROS-VN application digital media in improving prosocial behavior in early childhood and providing special assistance to children. in its use so that it can ensure the correctness and restrictions on the use of devices that are following capacity and safety for early childhood; Parents assist the school in improving early childhood prosocial behavior, one of the alternatives is through the application of the PROS-VN digital media application and assisting in its use; as well as researchers and developers of early childhood education media to focus more on aspects of developing children's potential so that every aspect of children's competencies stimulated through digital media can be utilized in their lives in the future.

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