

DEVELOPMENT OF DIGITAL CALISTUNG GAME LEARNING MEDIA FOR EARLY CHILDHOOD

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Abstract

This article aims to develop media learning games calistung digital for early childhood. The study is using a combination of research models and educational development approaches used is a model system designed by Walter Dick and Lou Carey and development tools software game calistung digital by using a model of the cycle of life from Parekh. The research method uses the R&D method in Borg and Gall which adopts the Dick and Carey model. The product testing phase begins with a material expert, a learning design expert, a learning media expert, and a multimedia expert. Then the products are tested to several children of age early, namely three people's evaluation of the individual, six people for the evaluation of the group of small and ten people to evaluate the group greatly. The results of the study showed the value of expert material is very good, the value of the expert design of learning is very good, the value of expert media of learning is very good, and the value of expert multimedia either. According to the expert, the material aspects of the assessment on (a) Compliance with learning objectives, (b) Simplicity, (c) Elements of message design, (d) Organizing materials, (e) Instructions for how to use are very good. According to the learning design aspects of assessment (a) instructional objectives, (b) Learning Outcomes Assessment Tools, (c) Developing Instructional Strategies, (d) Instructional Media is very good. According to the expert media learning as aspects of the visual / performance/quality technical, namely : (1) setting among others, (a) alignment, (b) the form, c) the rules of a third, (d) closeness, (e) the steering, (f) the contrast figure - setting; (2) consistency, (3) Balance, (4) Color, (5) Ease of reading, (6) Interest element of text/graphics/component accessory (1) Style letters, (2) size, (3) spaces, (4) colors, (5) the use of the letter big own following the principles of designing media learning. According to multimedia experts that (1) text, (2) images, (3) sound, (4) animation is following the principles of multimedia development is good. Then it can be concluded that digital calistung game learning media is appropriate to be used in learning.

Keywords: *Research and Development, Media Education, Games Calistung Digital, Early Childhood.*

1. Introduction

The students today is the first generation that grew up in the digital world. Cellphones, portable DVD players, computer games, *instant messaging*, and *iPods* are everyday devices. Such students are known as *digital natives*. The challenge for schools is to create an educational environment that goes beyond and enhances *digital* capabilities. These advances allow schools to make the transition from traditional to *digital* environments. These changes will have an impact on the future technology used by teachers and students, the structure of classrooms, and the role of the teacher.

The uniqueness of students must be facilitated by interesting learning patterns, one of which is the *game* media. *Digital game* learning media can be developed to answer the technological era and inevitably learning media has begun to shift to digital technology including learning media.

The results of the study five years of the last states that children aged early more active in learning through the device software application media calistung (Herwanto, 2012). Game digital Nussy helps to learn to read (Sabri, Blanchfield, & Hopkins, 2013). Playing a video game is regularly showed little activation of regions of the brain that is associated with attention (Bavelier, Daphne; Davidson, 2013). Games digital as the context of the development of cognitive, learning, and research development (Blumberg, Fran C; Fisch, 2013). When technology used by the right then the technology and media can improve the ability of cognitive and social children (ages 0-8 years) (Hernandes, 2014). Applications multimedia interactive which contains material calistung to display audio-visual can be used as a medium of learning in kindergarten (Faroqi, Adam; Maula, 2014).

Game education *smartphones* based on Android can help children of preschool in the process of reading the early (Busran; Fitriyah, 2015). Application device software like games for training awareness phonological at the level of kindergarten with the purpose to help the acquisition of reading in Turkey (Kartal & Terziyan, 2016). George, Stefan, Stefan, Crinrescu, Beligan, and Cirnu (2017) developed the game p Education of the game Tingo which supports learning the language, especially the introduction of vocabulary words. Duh and Koceska (2017) develop an application provider called Azbuka which is intended to help children learn to write letters Cyrillic and children are motivated to learn to write letters Cyrillic. Research Hurwitz & Schmitt (Hurwitz & Schmitt, 2019, p. 2) states 101 youth during childhood middle who participated in the evaluation of the game computer themed Ready To Learn (RTL) relationship curvilinear found between the score pretest children aged early and middle childhood. Effects RTL positive they can be measured during childhood middle but only for children with the ability to read at the bottom and the top of the average before the intervention early. Research Michelle examined the relationship between the emergence of skills reading writing children (N = 57 aged 2 to 4 years) and use the tablet at home to write and read. The correlational analysis shows a positive relationship between children's access to applications and print knowledge. A positive relationship was found between frequent writing with tablets and print awareness and sound knowledge (Neumann, Finger, & Neumann, 2017, p. 2). Kurniati, Tanzil, & Purnomo research creates, designs, and develops the Tales of Mamochi game with the RPG genre which is expected to be entertaining and very enjoyable to play in spare time (Kurniati, Tanzil, & Purnomo, 2015). Results of the study were carried out by (Herwanto, 2012), (Faroqi, Adam; Maula, 2014), (Busran; Fitriyah, 2015), (Kurniati et al., 2015), Putro , Kurniawati , and Angkoso (National & Information, 2014), Sudiyanto, Kurniawati , Hendrawan (National & Information, 2014), Priantoro, Hendrawan, and Kurniawati (National & Information, 2014) The results of research in Indonesia say that interactive learning media applications that contain reading, writing, and counting material with an audiovisual display can be used as a learning media tool. For addition, subtraction, multiplication, and division, the game maze can be used in low-grade children in elementary school. Game ALENA (Ajher Noles Nursery) for learning reading write -based mobile android who inserted the content language of Madura. Tales of Mamochi with RPG genre that is expected to be entertaining and very enjoyable. The problem now is how the teacher to design to use the medium of learning digital to be able to improve the skills of cognitive and language skills of early childhood. By thus can be concluded that the media learning digital is one of the forms of media learning which is packaged as a complete and systematic that contains the material to be able to improve the skills of cognitive and skills of language early childhood.

II. Literature Review

A. Development Media Learning Game Calistung Digital for Kids Age Early

Game calistung digital sign on a group of multimedia interactive because in the game calistung digital there is a display of text, audio, images, narration, and graphics that are equipped with the tool controller that can be operated by the user, so the user can choose what that is desired to process further that in the presentation including the multimedia interactive. Understanding multimedia according to Robinson in Munir said that multimedia used in this development is a learning presentation that combines the appearance of text, graphics, video, and audio and can provide interactivity (Munir, 2015, p. 5).

The study is using a combination of research models and educational development approach model system designed by Walter Dick and Lou Carey and development tools software game calistung digital by using a model of the cycle of life of Parekh with steps as follows (1) feasibility study, (2) requirement analysis, (3) project planning and management, (4) designing, (5) implementation, (6) integration, (7) delivery and maintenance (Parekh, 2007, pp. 652-654).

B. Learning Development

Many definitions of instructional design, one of which is from Shambaugh & Magliaro, states that instructional design is an intellectual process to help teachers systematically analyze learners' needs and build structured possibilities for responding to those needs responsively (Shambaugh, Neal; Magliaro, 2006, p. 33). Smith & Ragan said that instructional design is a systematic and reflective process of translating learning principles and instructions into plans for teaching materials and activities, information sources, and evaluations (Shambaugh, Neal; Magliaro, 2006, p. 35). The word systematic is a hallmark of learning design and a source for most of its strengths. Systematic is a regular uniform activity (Shambaugh, Neal; Magliaro, 2006, pp. 33-34). Reigeluth and Carr-Chellman said that instructional design is related to understanding, improving, and applying teaching methods (Reigeluth, Charles M; Carr-Chellman, 1983, p. 7). Further explained that the developer of learning is the process of deciding the method of learning that is best to bring the change that is desired in the knowledge and skills of students to fill the eyes of subject-specific and population of students specified.

Shambaugh & Magliaro said that instructional design has a systematic process that is linear with the core namely (1) determining what is needed, (2) developing a redesigned response, (3) testing the response, (4) evaluating the results (Shambaugh, Neal; Magliaro, 2006, p. 34).

Gustafson and Branch in Prawiradilaga stated that instructional design is a systematic process used to develop education and training programs consistently and reliably. Instructional design is a complex process that is creative, active and interactive (Prawiradilaga, 2014, p. 194).

The system is technically is a set of parts that are mutually related are all working together toward the determined goal (Dick, Walter; Carey, Lou; Carey, 2015, p. 1). Further said that the parts of the system depend on each other for input and output, and the whole system using feedback to determine whether the purpose of the desired has been reached, if not then system modified to achieve the goal. Gagne and Briggs define a system usually regarded as a complex human endeavor that serves a goal that is valued by humans. The term instructional system is often used to distinguish operations related to instructional students.

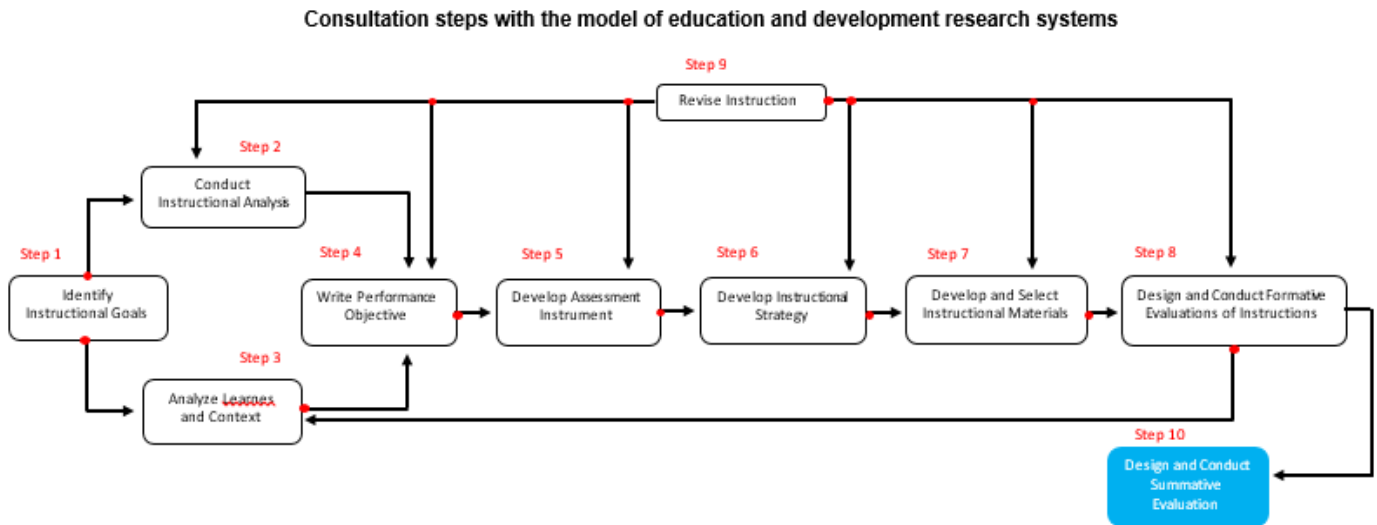
Suparman said various types of instructional activities such as face to face, instructional activities via television and radio, independent learning packages, web-based instructional activities (internet or intranet), instructional activities in laboratories, workshops, seminars, and *teleconferencing*. Components in any kind of activity instructional different or not entirely the same between one and the other. But both have various components which consist of purpose instructional, tool evaluation of instructional, the contents of instructional with a sequence-specific, method or approach to instructional, media and tools instructional, and the time instructional. All of these components besides having a function but also each of them is integrated and interacts as a whole that leads to the achievement of instructional goals (Suparman, 2014, p. 40).

C. Instructional Design Development Model

In designing and developing learning designs there are developing models that can be used, namely Kemp, Morrison, and Ross development models, ADDIE development models, Dick and Carey's development models, ASSURE development models, and Bella H. Banathy's development models, Newby Development Models, Stepich, Lehman, and Russell, and the Smith and Ragan development model

Although many models for designing learning but all of them have five stages, namely Analyze - Design - Development - Implement - Evaluate, which is called the ADDIE models (Taylor, 2007, p. 3).

The study of this model of development that is used is a model development of Dick, Walter; Carey, Lou; Carey, James O.



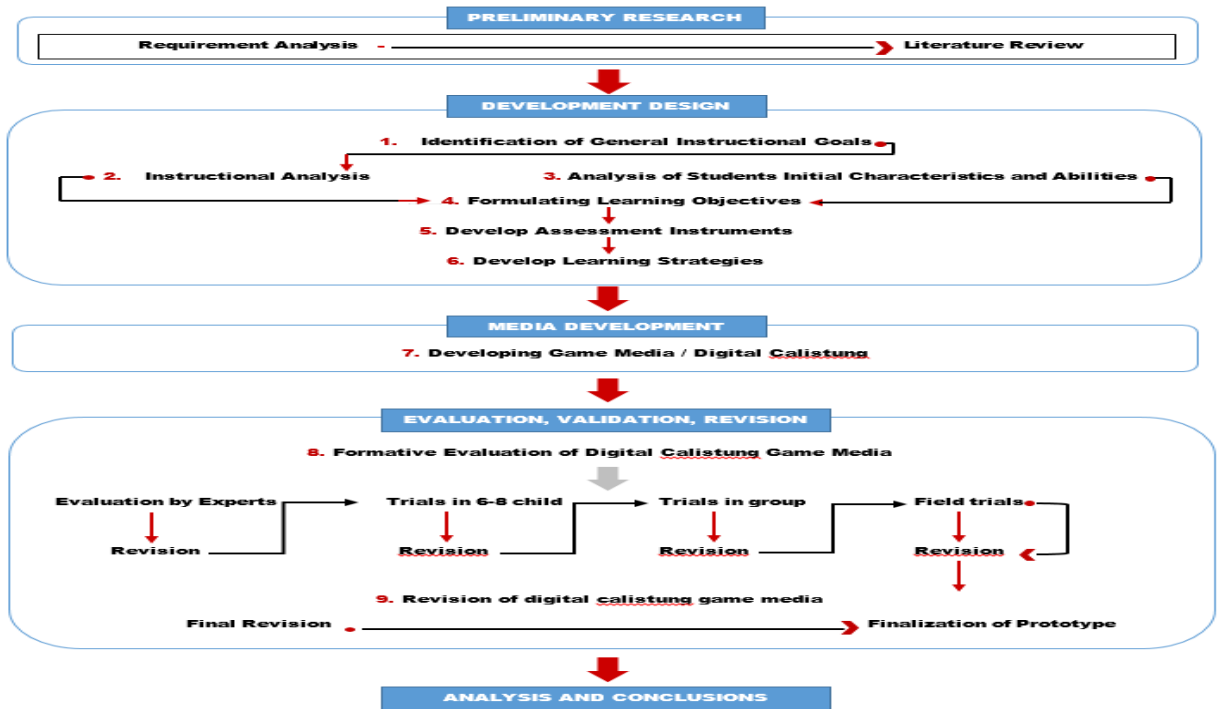
Picture 1. 2 Dick and Carey Development Model

Sources: Dick, Walter; Carey, Lou; Carey, James O. *The Systematic Design of Instruction*. Eighth Edition, PEARSON: USA, 2015, p. 1

One of the educational research and development models used is the system approach model designed by Walter Dick and Lou Carey, which is shown in the ten-step picture included in the R&D cycle version.

III. Learning Methodology / Media

Research This is a research development that will generate media learning which contains the material for the skills of cognitive and skills of the language of children aged 5-6 years. In detail, the purpose of the study is among (1) describe the use of media that is being used at the moment now that need to be developed medium of learning to improve the skills of cognitive and skills of the language of children aged 5-6 years, (2) to obtain the data regarding the feasibility media learning game calistung digital (3) to obtain empirical data about the effectiveness of digital calistung game learning media. This development research was carried out in Raudhatul Athfal group B, East Ciputat sub-district, South Tangerang City, Banten Province. The research was conducted in the academic year 2017/2018. Judging from the purpose of this study can be said as research and development (research and development). The research and development carried out for designing products and procedures just then applied to the test trying to pitch, evaluate and Touch ups of products and procedures with criteria for effectiveness, quality, and meet the standards. At the bottom is the image of a draft procedural digital calistung game-based learning media.



Picture1. 3 Procedure Design of Learning Media Based on *Digital Calistung Game*

Research is conducted for children aged early age of 5-6 years in the RA Budget Legosos subdistric Ciputat Timur, Tangerang Selatan City, Province of Banten, Indonesia. Data collection techniques through document analysis, questionnaires, and observation sheets. The data analysis technique is quantitative to calculate the results of the interview, distribute observation, score pretest and score post-test of a sheet of results of observation of students aged 5-6 years. Further analysis of the data qualitatively from interviews, observation, and documentation to look at the feasibility of media learning using evaluation interactive multimedia software (Smaldino, Sharon E; Lowther, Deborah L; Russell, James D translated by Rahman, 2011, p. 202) and Roblyer assessment component tables (Roblyer, MD; Doering, 2013, p. 186) using a scale of 1-4. Data reduction is the process of analysis by sorting the same data but obtained from different sources. In this process, the data is sorted and useless data will be discarded. While useful data will be stored and analyzed at a later stage. Data selection is done by checking, simplifying, organizing, managing, calcifying and summarizing data. The presentation of data is to display data that has been reduced in an orderly way so that it is easy to conclude. In this process, data are simplified and arranged systematically to provide a clear picture of the focus of research. The data that has been presented is then analyzed with confirmation to the theory and based on the evidence that has been collected.

IV. Results and Findings

Research is generating media learning game calistung digital which measures development tailored to the stage of development of image 1.3 at the top and will be explained at the bottom of this.

A. Preliminary Research

1) Requirement Analysis

In this stage, identification of the needs of learning media analysis is carried out, studying the literature and making initial observations about the characteristics of students. Several criteria are needed to determine the development of media among others:

- a. Media what just who has used the teacher in the learning of early childhood in RA subdistric Ciputat Eastern city of Tangerang south Banten?

- b. Media what course which has been developed teacher in the learning of early childhood in RA subdistric Ciputat Eastern city of Tangerang south Banten?
- c. How big the frequency of children aged 5-6 years in the use of smartphones?
- d. Do children aged 5-6 years know the application of digital learning games?

2) Literature Study

Some results of the study are related to the skills of cognitive and language of children aged 5-6 years in some research in the world and Indonesia.

B. Design Development

1) Identification of General Instructional Objectives

Based on a theoretical study, several specific learning abilities were developed for each of these dimensions. Cognitive dimensions consist of aspects of problem-solving, logical thinking, symbolic thinking which become several indicators, namely (a) recognizing surrounding objects based on names, colors, shapes, sizes, patterns, textures, (b) children can sort objects or objects based on shapes and color, (c) the child can classify objects or objects based on those shapes, colors, sizes, patterns, (d) children can put the object or objects in order or a series of specific, (e) children can recognize and create patterns, (f) children can calculate sambal memorize 1 to 20, (g) the child can display the correspondence one - one with numbers, (i) construct objects from small to large, (j) shows the great object, (k) try how else to solve the problem a friend the same age.

Dimensions language consists of aspects of understanding (receptive) language, express language and literacy are becoming some of the indicators, namely (a) the child may repeat a sentence of 11 or 12 parts of words, (b) Children can pronounce the word regarding the color, size, shape, taste, smell, beauty, speed, temperature, texture, distance, (c) children can do self- expression, writing, reading, and poetry, (d) writing with pictures and scribbles, (e) children make horizontal lines when making streaks, (f) children include shapes such as letters when writing, (g) children make several printed letters of names or initials, (h) children recognize early literacy, (i) children can read, write, count.

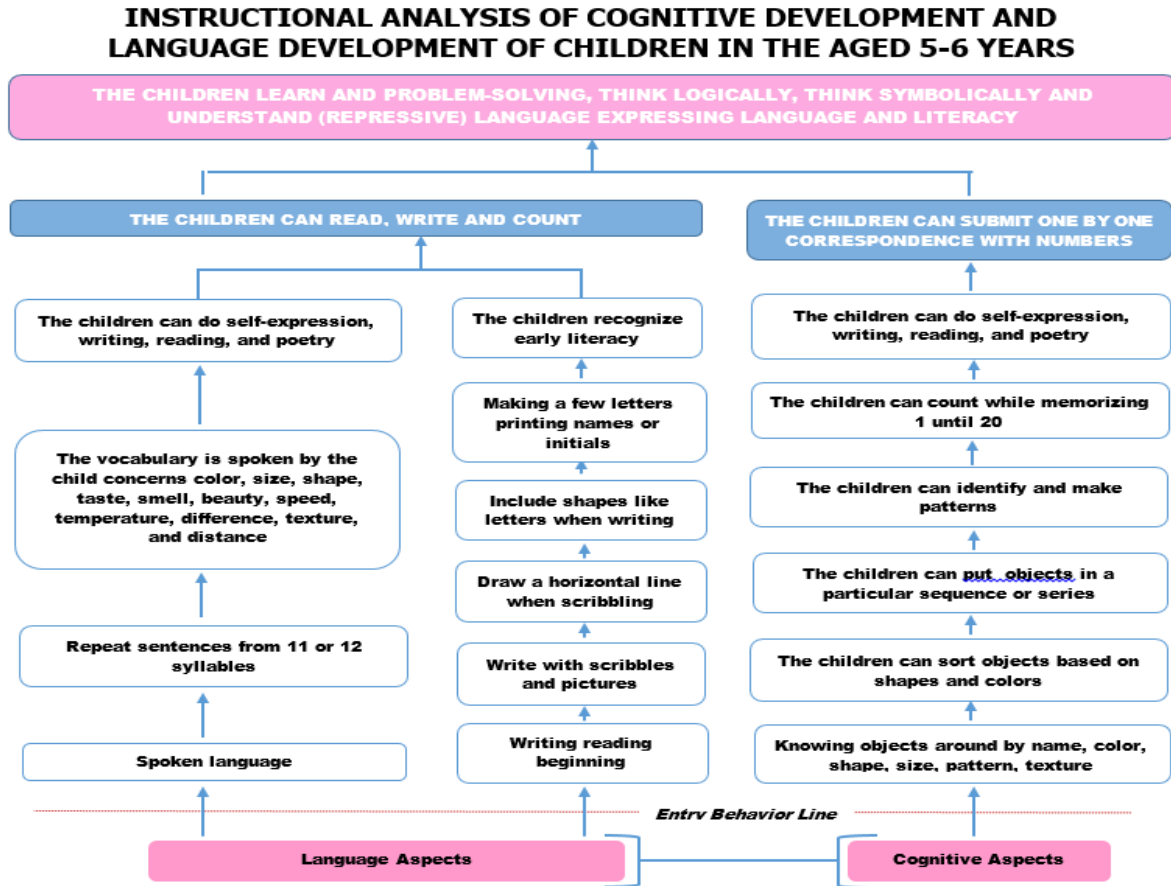
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3) Analysis Characteristics and Capabilities Participants Didik

Steps two and three can occur in any one sequence or conjunction. Based on the results of the questionnaire and the observation and documentation of the participant students and teachers than can be analyzed needs instructional that may be developed by the characteristics of the participant students in RA Melati Ciputat Timur.



4) Formulate Learning Objectives

The results of the analysis of instructional as drawing 4.1 then obtained 23 destinations instructional special. Following are the distribution of pics in ABCD format (A = audience, B = behavior, C = condition, D = Degree), namely :

Cognitive aspects		Language Aspects	
Material	Two - dimensional shape (square, triangle, round, rectangle) and color	Material	Connect or pair the symbol numbers with objects up to 10
TIK 1	Get to know things around by name, color, shape, size, pattern, texture	TIK 9	Children write with pictures and scribbles
Material	The shape of three -dimensional (cube, beam pyramid, tubes) and color	Material	Writing tribe says
TIK 2	Children can sort objects or objects based on shapes and colors	TIK 10	Repeating a sentence of 11 or 12 tribes word
Material	Grouping (based on color, shape, size, pattern)	Material	Make horizontal lines and form letters
TIK 3	Children can group objects or objects based on shapes, colors, sizes, patterns	TIK 11	Make horizontal lines when making streaks

Material	Comparing objects by size is more than - less than	Material	Tracing letters
TIK 4	Children can place objects or objects in a particular sequence or sequence	TIK 12	Include shapes such as letters when writing
Material	Sort objects by seriation (small - medium - large)	Material	Writing letters
TIK 5	Children can recognize and make patterns	TIK 13	Make a few letters printing names or initials
Material	Match the number symbol with the number	Material	Writing tribal word into words
TIK 6	The child can count chili memorizing 1 to 20	TIK 14	Vocabulary words are pronounced the child regarding color, size, shape, taste, smell, beauty, texture, distance
Material	A one-to-one, one-to-many relationship, a group to group symbol numbers	Material	The child recognizes the letters A through to Z
TIK 7	Kids can display the correspondence one - one with numbers	TIK 15	Children recognize early literacy
		Material	A sound relationship with letters
		TIK 16	Children can do self-expression, writing, reading, poetry
		Material	Relationship of numbers and numbers
		TIK 17	Children can read, write, count

5) Developing Assessment Instruments

Lattice compilation of evaluation instruments for digital learning media game calistung for learning design experts, expert media learning, expert multimedia, expert matter of learning, students, and teachers. Dimensions for the design of learning among others: (1) the formulation of objectives instructional, (2) a tool assessment results of learning, (3) prepare a strategy instructional, (4) media instructional, (5) the material instructional dimension to multimedia (1) text, (2) images, (3) sound, (4) animation. Dimension media learning (1) Elements of Visual / performance/quality technical, namely: a) setting among others; flattening, forms, rules -third, closeness, director, contrasting figure - background, b) Consistency, c) Balance, d) Colors, e) Ease of reading, f) Interest ; (2) Elements of text/graphics/component accessory among others; a) The style of letters, b) the size, c) space, d) color, e) the late ' letter big. Dimensions matter instructional among others a) Compliance with the purpose of learning, (b) Simplicity, (c) The elements of the design of the message, (d) Organizing ingredient, (e) Instructions how to use. Dimensions ratings media interactive among others (1) simplicity, (2) completeness, (3) learn step by step, (4) unity of multimedia, (5) continuity.

6) Developing Learning Strategies

Strategy of learning that is used is the strategy of learning through play. Playing the needs of children for passing play so children can develop the ability to value religious and moral, physical motor skills, cognitive, affective, social, language, and art.

Mulyasa mentioned the learning procedure through playing that there were three main steps, namely (1) the pre-playing stage, (2) the play stage, (3) and the closing stage (Mulyasa, 2017, p. 69). Methods are selected by the strategy of learning are a method of game. The game is the thing that is very attractive to children so that teachers can use the game in the learning of early childhood. With the game, the teacher can optimize the development of cognitive, language, social, emotional, value religion and morality, and art in early childhood.

C. Media Development

1) Develop Digital Calistung Game Learning Media

After the process of developing the draft instructional material is completed, it is continued with the development of instructional media by the stages of developing a multimedia device based on the *software life cycle model* consisting of a series of steps involving certain methods, as well as software tools and procedures. These steps are referred to as life cycle models. The life cycle begins with conceptualization and ends with certain products (Parekh, 2007, pp. 652-654). Furthermore, Parekh said the life cycle model upholds discipline in the process of developing and creating documents at each stage. Without software, the resulting life cycle model tends to be of poor quality that does not meet user requirements. Model of software life cycle generally involves steps as follows: (1) feasibility study, (2) requirement analysis, (3) Project Planning and Management, (4) designing, (5) Implementation, (6) integration, (6) delivery and maintenance.

D. Evaluation , Validation , and Revision

1) Formative evaluation of Digital Calistung Game Media

1.1 Expert Review

At the stage of review, expert-products are designed inspected, rated and evaluated, from some experts among others: (1) expert matter of learning, (2) expert design of learning, (3) expert media learning, (4) the expert of multimedia. On stage is feedback and advice from experts regarding the design of a product that has been created as an ingredient to revise and stated that the design is already valid or not so the weaknesses of the product could be revised back. An evaluation sheet for instructional media design experts is attached to this study. Researchers used a questionnaire by using a scale of 1 - 4. With the votes as follows (1) 3, 26-4, 00 means very good , (2) 2, 51-3, 25 means well , (3) 1, 76-2, 50 means good enough , (4) 1, 00 - 1, 75 means not good . After all the data that is collected is processed using Statistic simple. For assessment using the average of the value of the total. The average value is used as the basis to provide the level of assessment of media learning are developed. Research is involving several experts among others: (1) expert materials teaching early childhood which involves mother Lara Fridani, Ph. D lecturer of postgraduate University Jakarta State program of study education of children of age early, (2) the expert design of learning that involves the father of Dr. Robinson Situmorang lecturer of postgraduate University Jakarta State program of study technology education, (3) expert media learning that involves the mother Dr. Eveline Siregar, a postgraduate lecturer in Jakarta State University, education technology study program. (4) multimedia expert involving Mr. Lipur Sugianta, Ph, D postgraduate lecturer at Jakarta State University, technology, and vocational study programs

Media learning that has been rated by the experts and has been revised ready to be used in the process of learning of children aged 5 stars - 6 years for group B as RA Bed Ciputat Timur. This is in line with research by Kurniati, Nadia, Tanzil, and Purnomo Research (Kurniati et al., 2015, pp. 398-399) with the title of *Game Development research "Tales of Mamochi" with Role Playing Concept Games Based on Android* with the conclusion that the game " *Tales of Mamochi* " able to entertain the player with all the responses were commented upon by playing a game of this. Game This has an advanced graphical 2D interesting, interactive and meets the criteria of the eight rules of gold and five factors of man who measured game "Tales of Mamochi " have a story of fantasy that is interesting. By playing the game "Tales of Mamochi" the majority of players feel they can train resource management. Developing the main RPG features, namely Battle (PVE) with partners such as Mamochi, can make interesting games.

Alberti's Essay (Alberti, 2008, p. 268) with the title " *The Game of Reading and Writing: How to Video Games Reframe Our Understanding of Literacy*" .. This essay focuses on how video games highlight traditional assumptions about reading and writing and suggest alternative paradigms which combine the new and the traditional. Alberti brings how video games give implications to classroom writing. Game is one of the sources of the new that can help us to frame the understanding we are

about literacy in a way that allows us fatherly involve the students we are in the game to read and write.

Empirically Udjaja, Renaldi, Steven, Tanuwijaya, Wairooy (Udjaja, Tanuwijaya & Kartika, 2019, p. 304) with the title of the study "The Use of Role Playing Game for Japanese Language Learning" with the conclusion that the game *role-playing game for Japanese language learning* can improve the ability of English Japanese someone is basic and motivate someone to learn languages Japanese, motivation is happening because the principles of the game are fun.

Research Nacher, Sanjuan, and Jaen (Nacher, Garcia-sanjuan, and Jaen, 2016) with the title of *Interactive Technologies for Preschool Game-Based instruction: Experiences and Future Challenges* conclude that the first review of the state of the current of activity which helped the technology that supports the development of children-children pre-kindergarten and kindergarten in three dimensions (physical, social - affective, and cognitive) has been created. Analysis of the literature that there is revealed that the technology game is suitable to support the improvement and development of the capacity of the children was very young. The second is a series of challenges in the future that includes field development of children of preschool that has not been explored in any technologies in which the technologies that together can have an impact real.

Research by Bratitsis, Ziannas (Bratitsis & Ziannas, 2015, p. 239) in *From Early childhood to Special Education: Interactive Digital Storytelling as a Coaching Approach for Fostering Social Empathy* concluded that interactive digital storytelling can be expanded in special education to facilitate emotional and social intelligence, the inclusion of social and equality and interaction of social, applied both in the approach to training for both people with the needs of special or those that potentially relate to them in a way what was so Bratitsis and Ziannas attempt to create a story of digital interactive that will bring life every day and interaction of social normally through a circle of autistic children. It 's a growing empathy child's normal to children with autism, especially in the room class inclusive.

Research Manassis (Manassis, 2011) with the title of *Early Childhood post-Educated Teachers' Views and Intentions About Using Digital Games in the Classroom* shows that teachers of preschool generally have the views and intentions are very positive. The majority of the sample agreed that digital games function as a useful educational tool and can contribute to the learning process of children.

1.2 Testing One to One Learner

At this stage, the researcher examines the learning media that has been developed for students. Students who have been selected are students who have the capability of high, medium, low. On stage is the students are asked to provide feedback or comments on a sheet of validation that is provided for the product prototype. The results of the implementation are used to revise the learning media. After the learning media was revised, the media was then tested on three RA students aged 5-6 years. From the test results obtained that the digital calistung game media can be used as learning media for students aged 5-6 years. Results of the study showed that research Northrop & Killeen (Northrop & Killeen, 2013, pp. 535-536) there are a variety of dedication to practice the skills of literacy early as recommendation *app iwrite word, little matchups ABC, ABC pocket phonics, word Connex, icard sort, fry sight word, toontastic, icardsort, popplet, doodle buddy* as a recommendation *app* in the skills of literacy letter early. Regarding the use of *ipad* in the classroom as both a motivational and instructional tool, we strongly suggest that the use of technology be combined with effective learning to ensure that students really learn, not just press a button and through movement on the application.

Research Choli (Kokkalia, Georgia; Economou, Alexandra; Choli, 2017, pp. 23-24) provides an understanding of how children's little collaborate when playing the game, acquire the skills of literature, cognitive, math, motor and communication that much better with the support of the game serious and technology new while children who face difficulty learning and development have the opportunity to develop a strategy that is better to confront the problems they are.

Research Putro, Kurniawati, and Angkoso in the seminar of national technology information and computing (National & Information, 2014, p. 219) implements the game educational mathematical basis which is integrated into the application maze on-device *mobile* based android.

Research Priantoro, Hendrawan, and Kurniawati (National & Information, 2014, p. 235) developed educational games on *mobile phones* in learning basic mathematics.

Research Shohib (National & Information, 2014, p. 211) develop engineering wake game Alena for learning reading write -based *mobile android*. Alena Game is an educational game for learning to write Latin letters that are inserted Madurese language content.

Research Park (Park, 2013, p. 93) to determine the effectiveness relative of activity combined (using software computer and manipulative directly who do researchers) compared with the activity of mathematics traditional (just use the manipulative *hands-on* commercial) in the learning of children of preschool about seriation, classification logico, calculation, and the addition of the 37 children of preschool-aged three to five years at two preschools in Florida, US. The results showed that combined activation had a significantly more positive effect on participants' understanding of the concept of numbers, especially seriation and addition, than traditional activities.

Neumann, Finger, & Neumann's research (Neumann et al., 2017) conceptual framework that highlights the important role of non-digital and digital texts in the development of literacy skills.

Media games calistung digital can improve the skills of cognitive and skills of the language of children aged 5-6 years.

1.3 Testing Fields

Suggestions and test results on the prototype are used as a basis for revising the second prototype design. The result of the revision in the test on the subject of research in the case of this as a test field that involves a school with a total of 10 students. Taking field tests aims to determine the lack of learning media when used in learning. The process is carried out in class after the media field testing is revised. The results of the revision of learning media are the final learning media that are ready to be used in learning.

V. Conclusion

The results of the study showed the value of expert material is very good, the value of the expert design of learning is very good, the value of expert media of learning is very good, and the value of expert multimedia either. According to the expert, the material aspects of the assessment on (a) Compliance with learning objectives, (b) Simplicity, (c) Elements of message design, (d) Organizing materials, (e) Instructions for how to use are very good. According to the learning design aspects of assessment (a) instructional objectives, (b) Learning Outcomes Assessment Tools, (c) Developing Instructional Strategies, (d) Instructional Media is very good. According to the expert media learning as aspects of the visual / performance/quality technical, namely : (1) setting among others, (a) alignment, (b) the form, c) the rules of a third, (d) closeness, (e) the steering, (f) the contrast figure - setting ; (2) consistency, (3) Balance, (4) Color, (5) Ease of reading, (6) Interest element of text/graphics/component accessory (1) Style letters, (2) size, (3) spaces, (4) colors, (5) the use of the letter big own by the principles of designing media learning. According to multimedia experts that (1) text, (2) images, (3) sound, (4) animation are by the principles of multimedia and good development. Then it can be stated that the digital calistung game learning media is appropriate for use in learning.

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