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The development of parenting digital multimedia as an educational technology product to support early childhood learning process

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Abstract. The purpose of this study is to innovate a product in order to support the learning process of early childhood and to identify the increase of early childhood enthusiasm in following the learning process by using parenting digital multimedia as educational technology products. The researcher used ADDIE as the development method. The results obtained is that the parenting digital multimedia as an educational technology products proved to be worthy enough to be used in supporting the early childhood learning process. This can be proven through the results of media assessments conducted by media experts and material experts, as well as the increasing of early childhood enthusiasm in a process of learning in this study. The assessment results obtained from media experts, material experts, and paired t test shows that there is a significant change in the average enthusiasm of early childhood before and after using parenting digital multimedia of the developed educational technology products. Thus it can be concluded that this product can significantly increase the enthusiasm of early childhood in following the learning process.

1. Introduction

The influence of technological developments in education is clearly evident. One of them is the update of education and learning systems that utilize technology. Like the use of technology to conduct the Computer Based National Examination (CBNE), the number schools that held CBNE has increased by around 800% in the National Examination. The number schools that held CBNE has increased from 554 schools to 4,381. The government also plays an active role in improving the quality of education by supporting existing facilities in schools [1].

In addition to providing facilities, the government also provide the 2013 Curriculum. Implementation of the 2013 Curriculum at the Early Childhood Education (PAUD) level carries a thematic-supporting content, which makes children be actively involved in the teaching and learning process. Thematic learning emphasized on the children involvement in the learning process. Children are able to gain direct experience and to find out themselves the various knowledge they learn. Through direct experience, children are going to understand concepts that they have learned and connect it with other concepts they have understood [2].



The update effort aims to create a smart generation. However, with the rapid increase of technological developments, children are also affected by technological developments. One of them is the development of technological gadgets such as smartphones, laptops and tablets which are now very popular because of its easiness and practical use. According to okezone.com site, it can be seen that at the end of 2017 that smartphone usage has reached 58 million. One of them is caused by gadget technology that contains many interesting games and applications. Most of these applications tend to make children more interested in playing than learning, especially for early childhood. Because, early childhood has a very high tendency to play.

Early childhood learning activities are essentially concrete curriculum development in the form of a set of plans that contain a number of learning experiences through playing [3]. The process of early childhood learning activities emphasize more on instilling attitudes and character building through positive habituation according to the stages of the child's age. The early childhood education curriculum must build upon the development of 6 (six) aspects of the child's basic skills both physically and psychologically including moral and religious values, social emotional, cognitive, language, motoric and artistic. Supporting this opinion [4] stated, "Early childhood education is a strong foundation in the effort to prepare young people to face academic competition at the next level.

Increasing understanding of how children develop and learn has emerged a greater emphasis on Early Childhood Education; including the Play Group (KB), Kindergarten (TK) or preschool education which is attended by children aged 2 to 6 years [5] Child-centered education involves all children and pays attention to children's physical, cognitive and social development [4]. The development of information technology through visual media becomes a special attraction for children to satisfy their curiosity and to try to get involved in it through experiential learning. Experience should be endeavored by educators as one of the fun learning media.

Now more and more learning media are invented. One of the learning media used is parenting digital multimedia. Parenting digital multimedia is a computer-based technology that is used to convey a message of home activities to children, both in the form of text, graphics, animation, audio, and video. Parenting digital multimedia makes it possible to develop learning in a digital form. This is in line with 2013 Curriculum which uses thematic approaches to stimulate children's activity. In addition, the use of digital parenting can also make learning be more interesting and can increase children's curiosity with the support of animation and audio.

According [6] basically, computer-based technology displays information to learners through presentation on the monitor screen. Parenting is an educational effort carried out by utilizing the resources available around the family and environment in the form of independent learning activities. Parenting as a process of ongoing interaction between parents and their children includes the following activities: nourishing, guiding and protecting children as they grow [7] Parenting programs can be useful for parents/families as the main educators and for Early Children education managers to harmonize the education done in institutions of Early Children Education with the learning process at home so that children's growth can be achieved optimally [7].

Today, parenting is transformed into parenting digital multimedia, which does not only rely on action messages but is combined with music, animation, interactivity and narration simultaneously. So, it brings a different atmosphere to the children. The making of parenting digital multimedia is quite easy, because many applications that we can use include *VideoScribe*, *Powtown*, *Adobe Flash* and many more according to user needs.

Annida Ya Fatimah Play Group/Kindergarten is the chosen institution in Pati Regency, Central Java, which has used 2013 Curriculum. However, learning media that support children's learning are only books. A breakthrough is expected in the learning process. One of them is by providing new learning media that can attract children to learn. Annida Ya Fatimah Play Group/Kindergarten has complete facilities to support the learning process using parenting digital multimedia in the classroom.

Digital parenting was chosen to be developed because it is quite easy to make, so the class teachers can make it themselves and implement it in their classroom learning, and digital parenting is effective in increasing children's enthusiasm in learning. This is based on the opinion of [8] which said that: "An engaging, multimedia-rich Digital Story can serve as anticipatory set or hook to capture the attention

of students and increase their interest in exploring new ideas." A number of researchers supports the use of anticipatory sets at the beginning of a lesson to help students engage in the learning process." As deal with [9] that conducted in their research the effectiveness of web-based portfolio model with field data from the respondents of large group trial participants is indicates that the web-based portfolio model is effective. This research is to create innovation in supporting the learning process and to identify the increased enthusiasm in the learning process with the use of parenting digital multimedia.

2. Method

The researcher used the ADDIE model development method (Analysis-Design-Develop-Implement-Evaluate). The ADDIE model was developed by Alan Januzewski and Michael Molenda.

The stages of Analysis carry out a needs analysis consisting of curriculum analysis, learning theme analysis, analysis of facilities and infrastructure, user analysis, and media analysis. The stages of design are making learning media planning before the media is created; including making flowcharts, concept maps, material maps, storyboards and GBIM (Outline of Media Content). The stages of media development are used as ready-to-use learning media based on pre-made designs ranging from flowcharts, GBIMs, storyboards, and others. In this stage of development, the media will be a program that is ready to be tested by media experts and material experts to find out the weaknesses of the media, so that it can be revised in order to make a good product.

The implementation stages of the researcher are conducting a trial of small groups and large groups including children and teachers to test the media that had been made. The stages of media evaluation are given an assessment of the feasibility of the media based on the results that have been obtained from the questionnaire that has been distributed to children, media experts and material experts and then calculated each aspect of the media along with the explanation.

3. Result and Discussion

Data obtained from the analysis are curriculum analysis, analysis of the theme of activities, learning infrastructure, user analysis, and media analysis. The results of the analysis then became a reference for the design of the material map design, the design of the GBIM (Outline of Media Content), flowchart design, user interface (UI), user experience (UX), and preparation of the manuscript.

The stages of parenting digital multimedia development began with the pre-production process, namely the stage before making production which includes preparation of equipment to make the parenting digital multimedia. The following are materials needed in the production process; laptops, microphones, other software such as *VideoScribe*, *Cool Edit Pro* (sound editing), *Adobe Flash* software, flowchart designs and scripts. The production stage is the stage of making / developing learning media to become a product that can be implemented in learning. The final process is the post-production stage. After the product is finished, the researcher validates the media with the help of media experts and material experts.

Implementation stage is done after learning media are developed and validated by the experts. Hereafter, the media is ready to be implemented. The stages of evaluation is done to determine the feasibility of the parenting digital multimedia program produced.

The method used to find out if parenting digital multimedia programs can increase children's enthusiasm in learning is by data triangulation method. It consists of observation, interviews, and documentation. This method is carried out by researchers because it is considered to be able to dig up the information needed by researchers. The first step is to observe the children's daily learning at school in order to find children who will be the subject of the observation.

The researcher made observations to obtain learning data using parenting digital multimedia, to be compared with learning without using parenting digital multimedia which aims to determine whether there is an increase in children's enthusiasm in learning or not. After the observation data is collected, to strengthen the observation data the researcher conducts an interview to children and class teachers about the children's enthusiasm in learning using the parenting digital multimedia.

3.1 Feasibility Validation of the Parenting Digital Multimedia Digital

Validation results to measure the feasibility of parenting digital multimedia by material experts and media experts, the observed children get the following results.

Table 1. Material expert validation result.

No.	Variable	Max Score	Score	Percentage	Explanation
1.	Material Aspects	20	17	85%	Very feasible
2.	Media Aspects	25	22	88%	Very Feasible
3.	Learning Aspects	20	17	85%	Very feasible
4.	Language Aspects	10	8	80%	Feasible

The results obtained from the material aspects are 85%, media aspects are 88%, learning aspects are 88%, and language aspects are 80% with the total maximum value of each aspects are 100%. The average of all aspects is 85.3%, which can be categorized as "very feasible".

Table 2. Media expert validation result.

No.	Variable	Max Score	Score	Percentage	Explanation
1.	Learning Aspects	25	19	76%	Feasible
2.	Interactivity Aspects	20	16	80%	Feasible
3.	Media Aspects	25	20	80%	Feasible
4.	Interface Aspects	25	28	80%	Feasible
5.	Language Aspects	10	8	80%	Feasible
6.	Program Aspects	10	8	80%	Feasible

The results obtained after conducting media validation to media experts from the learning aspects are 76%, interactivity aspects are 80%, media aspects are 80%, display aspects are 80%, language aspects are 80%, and program aspects are 80%, and the total maximum values of each aspects are 100%. The average of all aspects is 79.2% which is categorized as "feasible".

Table 3. The trial results on 35 children.

No.	Variable	Max Score	Score	Percentage	Explanation
1.	Material Aspects	700	602	86%	Very Feasible
2.	Learning Aspects	700	594	85%	Very Feasible
3.	Interactivity Aspects	350	297	85%	Very Feasible
4.	Media Aspects	875	782	89%	Very Feasible
5.	Interface Aspects	525	445	85%	Very Feasible
6.	Language Aspects	350	319	91%	Very Feasible

The results obtained after testing 35 children in the material aspects are 86%, learning aspects are 85%, interactivity aspects are 85%, media aspects are 89%, interface aspects are 85%, and language aspects are 91%, with the total maximum values of each aspect is 100%. The average of all aspects averaged is 87% which is categorized as "very feasible". Based on the results obtained from expert validation and the trials it can be concluded that parenting digital multimedia products developed using the Analyze, Design, Development, Implementation, Evaluation (ADDIE) is feasible and can be used in the teaching and learning process in the classroom.

3.2 Children's enthusiasm level in using Parenting Digital Multimedia

Data obtained from the observations of children aimed to determine changes in the level of enthusiasm children in learning using parenting digital multimedia. After the researcher made a thorough observation of the children there was an increase in enthusiasm on the children who previously seemed less enthusiastic to start learning which could be seen from the children that were talking to their friends or busy with themselves instead of following the learning process. Their facial expressions showed that they felt less interested in the lesson, and their eyesight were not focused on the blackboard in front of the class. After using parenting digital multimedia, children became more enthusiastic in learning. Children look happy with learning using the parenting digital multimedia and children focus more on learning process. Moreover, in terms of activity in the classroom, after using digital parenting multimedia children who previously tended to be passive became more active in asking questions and children voluntarily came forward to answer the questions showed in the media. Learning by using parenting digital can create a more cheerful atmosphere and the learning process is able to run well because of the feedback from the children by asking questions to the teacher.

The researcher also focused on observing the children with different levels of enthusiasm, namely high levels of enthusiasm, moderate enthusiasm, and low enthusiasm. The results obtained in high enthusiasm children before and after using parenting digital multimedia as a means of learning showed an increase in enthusiasm. Children who previously had a high level of enthusiasm became more enthusiastic after using digital parenting multimedia, it was shown by the increased of their focus in learning process.

In terms of activeness in the classroom, basically children are quite active in class before and after using parenting multimedia digital, the only difference is that children are more courageous to come to the front of the class to answer questions asked by the teacher. The learning atmosphere seems more flexible and cheerful as there is no sense of stress, and children learn while adventuring by following the stories presents in the parenting digital multimedia.

The results obtained from the children with moderate enthusiasm are their enthusiasm in learning increased after using parenting digital multimedia. Before using digital multimedia parenting, children often play by themselves and their focus in learning does not last long, but after the use of parenting digital multimedia children are more focused and interested in the learning process. It is shown by children who concentrate on the material in parenting digital multimedia from the beginning until the end.

The level of children's activity has also increased. Children who were previously passive and just kept quiet, did not ask anything to the teacher, after the use of digital multimedia parenting, the children became more active. They often asked the teacher and answered questions in front of the class. It creates a pleasant learning atmosphere and children are able to be bravely express their opinions.

The observation to the children with low learning enthusiasm shows that using digital multimedia can increase their enthusiasm in the learning process. Before the use of parenting digital multimedia, the enthusiasm of children in learning is very low, which can be seen from children who gave no attention to the learning process and even sleep during the class. After using parenting digital multimedia, the enthusiasm of children significantly increased. It could be seen from the increased number of children that were concentrating and paying attention to the learning process from the beginning to the end.

3.3 Observing Based Enthusiasm Test

In measuring the level of enthusiasm of children in the classroom by using parenting digital multimedia, it was conducted in two stages. First, observing classroom learning before the use of parenting digital multimedia. Second, observing classroom learning after the use of parenting digital multimedia.

Based on observations before and after using parenting digital multimedia, the average of enthusiasm difference of children obtained before using the media was 36.62 with a deviation of 5.999

and the average after using the media was 43.38 with a deviation of 2,669, and the number of samples was 16 children.

The results of the calculation obtained are the difference in average of -6.75 with a standard deviation of 3.808. The results for sig are $0.002 = 0.2\% < 5\%$, so H_0 is rejected. It means, the average enthusiasm of children before and after using digital multimedia parenting changes. So it can be concluded that the use of parenting digital multimedia can increase children's enthusiasm in learning. This is relevant with the theory according to Sadik [10]. "Digital parenting, when it is integrated into classroom settings, can be a compelling teaching methods to gain and hold students' attention. At the same time, it provides a creative and open-ended environment."

3.4 The Response of Children Toward the use of Parenting Digital as Learning Media

The researcher interviewed eight children who were considered as being able to provide valid data when they answered the question, "Does the use of parenting digital multimedia make the learning more fun?" Children said that parenting digital multimedia is more fun. Researchers then explore further information about the reasons children prefer to use parenting digital multimedia. The answers obtained are because parenting digital multimedia is more interesting. Children said parenting digital multimedia is interesting, either in terms of images, sounds, or material in which children were curious about the material presented. Children felt adventurous and didn't feel bored because every scene from the parenting digital multimedia has different background image.

It is not only attracting children's interest, but also this parenting digital multimedia can enhance children's learning enthusiasm. It was proven by the children's response when the researcher asked, "Does the use of learning media increase your enthusiasm on learning"? The children answer; "Yes, because using learning media is comfortable and not boring."

Learning by using parenting digital multimedia for younger children makes children be easier in understanding the material. On responding a question, "Does the use of parenting digital learning media makes the material easier to understand?" The children answer, "It's easy to understand, because the language is clear, interesting, and there is also a video on it". This shows that the presentation of material in parenting digital multimedia is understandable. Because, the language used is clear, the narrative is clear so that children are easier to learn. Moreover, when they were asked, "Do you want to use parenting digital multimedia again in learning process?" All children answered they wanted to use parenting digital multimedia again in their classroom learning.

3.5 The Response of Teachers toward the Use of Parenting Digital Multimedia as Learning Media

The researcher conducted an interview again to the teacher to strengthen the data. The researcher conducted an interview regarding; "Does using parenting digital multimedia learning media make children more enthusiastic about learning?", The teacher answers; "After I saw yesterday there was indeed an increase in some children who were previously less active and enthusiastic in the class to be more enthusiastic". The statement given by the teacher above shows that using parenting digital multimedia can increase children's enthusiasm in learning. This was proved by the increasing enthusiasm of children in learning after using parenting digital multimedia.

In addition to the increased level of enthusiasm, children also can understand the material better by using parenting digital multimedia. This is proven when the teacher is given a question; "Does the parenting digital multimedia learning media make it easier for children to understand what is being taught?" The teacher replied, "It is easier to understand because by using media that have images, animations and videos, children are more interested in learning the material".

The teachers feel much assisted by the parenting digital multimedia. Other than be interesting, the media is also easy to operate by the teacher in the classroom. So, it would be better if in the classroom they conduct a learning using parenting digital multimedia at least for once a week. Besides that the material is quite understandable for the children, the use of parenting digital can be an entertainment / refreshing for children to not get bored with the learning process.

4. Conclusion

The result of the development of parenting digital multimedia using the ADDIE model is feasible to be used as a means of supportive learning. The level of feasibility obtained by researchers after validating the product to media experts is getting results of 79.2%, to material experts get 85.3%, the trials on 35 students get 87% from the total maximum value of 100%. Thus it can be concluded that parenting digital multimedia is appropriate to be used as a means of supporting the learning process.

The level of enthusiasm of children is measured through observations and interviews conducted by researchers towards the teacher and the children concerned. The results obtained by researchers show that children are very enthusiastic and feeling happy with the learning through parenting digital multimedia, and it shows an increase in children's enthusiasm in learning.

The t-test calculation results obtained the average enthusiasm difference of children before using the media is 36.62 with a deviation of 5.999 and the average after using the media is 43.38 with a deviation of 2,669, the number of samples is 16 children. The average difference is -6.75 with a standard deviation of 3,808. The results for sig are $0.002 = 0.2\% < 5\%$. It means, the average of children's enthusiasm before and after using digital multimedia parenting has changed. So it can be concluded that the use of parenting digital multimedia can increase children's enthusiasm in learning.

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