

Educational Game-Based Thematic Learning Media to Improve Student Learning Competence

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ABSTRAK

Adanya keterbatasan media pembelajaran yang menarik pada mata pelajaran tematik berdampak pada rendahnya kompetensi belajar siswa. Untuk dapat meningkatkan kompetensi belajar siswa, maka dibutuhkan media pembelajaran digital yang mudah untuk diakses siswa. Adapun tujuan dari penelitian ini adalah untuk mengembangkan media pembelajaran tematik berbasis game edukasi untuk meningkatkan kompetensi belajar siswa kelas IV. Penelitian ini adalah penelitian pengembangan dengan menggunakan model hannafin & peck. Subjek penelitian adalah 1 orang ahli isi, 1 orang ahli desain, dan 1 orang ahli media pembelajaran, kemudian 3 orang uji coba perorangan, 6 orang uji coba kelompok kecil, dan 15 orang uji coba lapangan. Pengumpulan data dalam penelitian ini dilakukan menggunakan metode kuesioner dan tes, dengan instrument penelitian berupa kuesioner uji validitas produk dan tes hasil belajar siswa. Data yang diperoleh dalam penelitian kemudian dianalisis dengan menggunakan teknik analisis deskriptif kuantitatif serta metode analisis deskriptif kualitatif. Hasil analisis penelitian menunjukkan bahwa produk yang dikembangkan valid berdasarkan hasil ahli isi diperoleh 95,50%, ahli desain pembelajaran diperoleh 88,00%, ahli media pembelajaran 94,67%, uji coba perorangan yaitu 92,67%, uji coba kelompok kecil yaitu 95,17%, dan uji coba lapangan yaitu 95,70%. Berdasarkan hasil tersebut maka dapat disimpulkan pengembangan game edukasi pada mata pelajaran tematik di kelas IV ini tergolong dalam kualifikasi sangat baik dan dinyatakan layak digunakan dalam proses pembelajaran.

ABSTRACT

The limitations of interesting learning media on thematic subjects impact low student learning competence. To improve student learning competence, digital learning media is needed that is easy for students to access. This study aims to develop educational game-based thematic learning media to improve the learning competence of grade IV students. This research is developmental research using the Hannafin & Peck model. The research subjects were one content expert, one design expert, and one learning media expert, then three individual trials, six small group trials, and fifteen field trials. Data collection in this study was carried out using questionnaires and tests, with research instruments in the form of product validity test questionnaires and student learning outcomes tests. The data obtained in the study were then analyzed using quantitative descriptive analysis techniques and qualitative descriptive analysis methods. The research analysis results showed that the products developed were valid based on the results of content experts obtained at 95.50%, learning design experts obtained at 88.00%, learning media experts at 94.67%, individual trials at 92.67%, small group trials at 95.17%, and field trials 95.70%. Based on these results, it can be concluded that developing educational games in thematic subjects in class IV is classified as a very good qualification and is declared suitable for use in the learning process.

1. INTRODUCTION

Learning in the 2013 curriculum in Indonesia is implemented by implementing a thematic learning process. Thematic learning is a learning concept presented with integrated learning techniques and designed into several specific themes (Ngazizah et al., 2022; Rohmanurmeta & Dewi, 2019). The

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theme, in this case, relates to the main idea or main idea used as the subject matter, where there are various material concepts from several subjects (Anisah & Holis, 2020; Riani et al., 2019; Winaya, 2019). The development of themes in thematic learning is carried out to train students to associate one piece of information with other information to obtain conclusions from this information (Dewanti & Yasmita, 2022; Tambunan et al., 2021). In addition, thematic learning is also carried out to reduce the overlap between one material and another so that it can make it easier for students to see meaningful relationships in understanding the material/concept as a whole (Deviana & Kusumaningtyas, 2019; Nabela et al., 2021; Situngkir et al., 2022). The achievement of thematic learning outcomes can be seen from the learning competencies shown by students. Learning competence is the knowledge, skills, attitudes, and values students show through thinking and behaving habits resulting from the learning process (Astuti et al., 2019; Prabaningrum & Putra, 2019). Increasing student learning competence can be done by using media in the learning process. It is because the media can improve the learning process's atmosphere and effectiveness (Handayani & Abadi, 2020; Wulantari et al., 2019).

Learning media has a significant influence on the teaching and learning process. The media used will make the learning atmosphere more varied (Harris & Isyanti, 2021). Media is a messenger that can be used for learning (Borman & Erma, 2018; Nirwana, 2021). Learning media as a support for the learning process can be developed according to the abilities of teachers and students. Learning media development is now quite easy to realize because many tools or development software and supports exist in making learning media. Learning media has two important elements: equipment and hardware (Borman & Erma, 2018; Rahmayani & Sumitra, 2022). Learning media is not just equipment but messages the media can convey to students. Learning media development will only be used effectively for students if the learning media is easy to understand. In the development of learning media, teacher creativity is needed so that learning messages are easier for students to understand (Kurniawan et al., 2020; Panjaitan et al., 2020). It's just that the reality on the ground shows that the media used by teachers in the learning process is still limited to print media (Mulyati & Evendi, 2020). The use of print media in the learning process can indeed help the learning process. It's just not fully able to help because it quickly makes students bored. It aligns with the observations made at SD Negeri 1 Banjar Bali. The observations and interviews show that in the learning process, the teacher has used several types of print media that are easily accessible. The application of print media cannot fully help the student learning process because the number of media used tends to be limited and cannot be reached by all students. This certainly has an impact on the uneven learning competencies possessed by students.

In this era of technological advances, digital platforms can greatly assist the student learning process. One digital media that can be used is thematic learning media based on educational games. Thematic learning media are learning media that can contain various materials in one teaching media (Riani et al., 2019; Suryana & Hijriani, 2021). Thematic learning media allow teachers to teach various material concepts in one medium, thus facilitating the teaching and learning process (Krissandi, 2018). Thematic learning media will be able to attract students' attention if accompanied by the application of educational games. It is related to the characteristics of students who prefer playing to learning. Play is a process by which learning involves thoughts, concepts, perceptions, and social skills (Harris & Isyanti, 2021; Rahma et al., 2017). Learning multimedia, such as games, can be utilized in the learning process. In-game learning media, students are asked to make decisions from several available choices (Kartika et al., 2019; Mayer, 2019). Games in learning are used to increase understanding quickly because interesting games and students support them to become active in learning (Wijayanto & Istianah, 2017). Educational games can make students feel more relaxed, enthusiastic about learning, and open to receiving subject matter (Kusumawati, 2022; Pratama, 2021). If the games used in fun learning allow students to be interested in spending a lot of time learning, it will not be felt that time passes quickly during the learning process. In addition, the application of games in the learning process can make students more active in class.

Several studies have revealed that educational game-learning media is appropriate for children because it can improve early childhood literacy and language skills (Harris & Isyanti, 2021). The results of other studies also reveal that educational game media can combine visual, auditory and kinesthetic learning styles to foster joy in children, especially in the learning process. (Borman & Erma, 2018). The results of further research revealed that interactive games are suitable for use to develop aspects of language development in early childhood (Mardhotillah & Rakimahwati, 2021). Based on some of the results of these studies, educational game media is very suitable for use in the learning process because it can increase student enthusiasm for learning. It's just that in previous studies, no studies specifically discussed educational game-based thematic learning media to improve student learning competence. So

this research is focused on this study to develop thematic learning media based on educational games to improve the learning competence of fourth-grade students.

2. METHOD

This research belongs to the type of development research that was developed using the Hannafin and Peck model. Hannafin and Peck's research model was chosen because this development model is easy to understand and includes a simple and elegant research model, so it is quite widely used. The Hannafin and Peck model has three stages, namely the first stage is the needs analysis stage, the second stage is design, and the third stage is development and implementation. This development model involves an evaluation and revision process at all stages. The process of the stages of the Hannafin and Peck model can be seen in Figure 1.

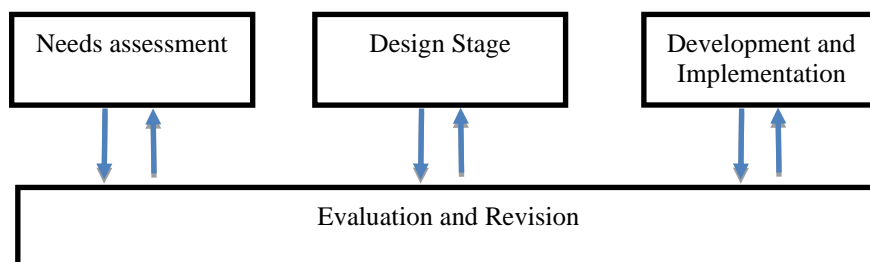


Figure 1. Hannafin and Peck Development Model

The needs analysis stage in the Hannafin and Peck model was carried out by analyzing learning problems, student analysis, and goal analysis at SD Negeri 1 Banjar Bali. Furthermore, the design stage is carried out by continuing the determination and analysis of targets carried out in the analysis stage, namely compiling an outline of the media, compiling media characteristics, designing media, making media assessment instruments, and compiling learning activities. The last stage is the media development and implementation stage, including activities to integrate, develop and create new learning programs. Then the learning products that have been developed will then be evaluated to obtain devices that suit the needs and can be implemented in real learning. This implementation is carried out to determine the user's response to the educational game learning media.

Data collection in the study was carried out using a questionnaire or questionnaire method. The data collection method is through the implementation of a formative evaluation questionnaire, namely data from the review of content/material experts in the field of study, data from the review of learning media experts and data from the review of learning design experts, data from the results of individual trials and small group trials in the form of student reviews, and data from the results of field trials in the form of student learning test results to test the differences before and after using the game. The questionnaire method is the method used and has been tested by experts and students. The questionnaire instrument grids for content experts, design experts, media experts, and individual and group trials can be seen in Table 1, Table 2, Table 3, and Table 4.

Table 1. Grid of Learning Content Expert Validation Instruments

No	Aspect	Indicator	Number of Items	Question Number
1.	Learning	1. Basic competence	5	1,2,3,4,5
		2. Indicators		
		3. Learning Objectives		
		4. The material presented		
		5. Motivation		
2.	Language	1. Grammar	4	6,7,8,9
		2. Writing spelling		
		3. Writing terms		
		4. Use of punctuation marks		

Table 2. Grid of Learning Design Expert Validation Instruments

No	Aspect	Components	Number of Items	Question Number
1	Presentation of material	Clarity of material description Learning model Presentation of material varies language used	5	1,2,3,4,5
2	exercise	Clarity of questions feedback	5	6,7,8,9,10

Table 3. Grid of Learning Media Expert Validator Instrument

No	Aspect	Indicator	Number of Items	Question Number
1	Learning	Relationship between Core Competency, Basic Competence, and Indicators and Learning Objectives Directions for Use Interaction in Learning Motivation	4	1,2,3,4
2	Appearance	text clarity image clarity video clarity color clarity	8	5,6,7,8,9,10,11,12
3	Programming	Consistent with the flow of the program Consistency between parts of the lesson	5	13,14,15,16,17

Table 4. Individual, Small Group, and Field Test Validator Instruments

No	Aspect	Indicator	Number of Items	Question Number
1	Teks grafis	Text Clarity Font type	3	1,2,3
2	Gambar	Image suitability	5	4,5,6,7,8
3	Tampilan	Display suitability Navigation key	4	9,10,11,12

The data obtained in the study were then analyzed using quantitative descriptive analysis techniques and qualitative descriptive analysis methods. Quantitative analysis methods are used in processing data obtained from questionnaires or questionnaires and then converted into scores which are then analyzed using the conversion of achievement levels with a scale of five. The qualitative descriptive analysis method is used in processing research data from product reviews conducted by experts and product trials on students. The data in question are in the form of suggestions, comments, and improvements, where the acquisition from the questionnaire is then used in revising the teaching media being developed. The results of this research are in the form of an average of the results obtained and then converted with the achievement level conversion guideline with a scale of five to determine the validity of each component of the teaching media developed. The attainment level conversion guidelines with a scale of five are presented in [Table 5](#).

Table 5. Conversion of Achievement Levels with a Scale of 5

Achievement Level %	Qualification	Description
90-100	Very good	No need to revise
75-89	Good	Slightly revised
65-74	Enough	Adequately revised
55-64	Less	Much needs to be revised
0,54	Very less	Repeated making products

3. RESULT AND DISCUSSION

Result

This research is the development of educational game-based learning media in thematic lessons for fourth-grade elementary school students. The development model used in this study is the Hannafin and Peck development model. The first stage is needs analysis. Three things are done: needs analysis, competency analysis, and analysis of learning environment facilities. The needs analysis found that students who only studied with media were limited to books and media available at school. Then competency analysis is carried out to determine basic competencies and learning indicators to be achieved. Then finally, there is an analysis of school environmental facilities to find out what facilities are in the school that can optimize the learning process.

The second stage is the design stage. Some of the activities at this stage are determining basic competencies and learning indicators, making flowcharts and storyboards, compiling grids and items, and preparing lesson plans. Furthermore, the third stage, namely development and implementation, is carried out by collecting materials and materials obtained from class IV textbooks, thematic textbooks, and relevant books. The Adobe Flash CS6 application was used as the main product creation program in making this product: Microsoft Word 2013, Coreldraw X7, and Powerpoint 2013. The results of developing educational game-based learning media in thematic lessons are presented in Figure 2.



Figure 2. Display of Educational Game-Based Thematic Learning Media

After going through the three stages of development, the developed media will be implemented to determine the feasibility and validity of the product being developed. The presentation of trial data explains the validity of educational games consisting of six main points, namely the validity of educational games according to learning content experts, learning design experts, learning media experts, individual trials, small group trials, and field trials. The results of testing the validity of the educational game learning media developed are presented in Table 6.

Table 6. Percentage of Expert Test Results and Trials of Educational Game-Based Learning Media

No.	the subject of the validity test	Result (%)	Qualification
1.	Learning Content Expert Test	95.5	Very good
2.	Learning Design Expert Test	88	Good
3.	Learning Media Expert Test	94.67	Very good
4.	Individual Trial	92.67	Very good
5.	Small Group Trial	95.17	Very good
6.	Field Trials	95.7	Very good

Based on the results of the validity of the learning content expert test, a score of 95.5% was obtained, which was very well-qualified. The validity results of the learning design expert test obtained a score of 88%, which was well-qualified. The validity results of the learning media expert test obtained a score of 94.67%, which was very well qualified. Furthermore, individual trial results obtained a score with a percentage of 92.67% which qualified very well. Small group trials obtained a score of 95.17% which qualified very well, and field trials obtained a score of 95.7% which had very good qualifications. The effectiveness of developing educational game-based learning media that has been developed is measured using an effectiveness test which includes a pre-test and post-test to determine student learning outcomes before and after using educational game-based learning media in thematic lessons for fourth-grade students of SD Negeri 1 Banjar Bali. Based on the results of the t-test calculation, it was found that the t-count value was 16,689, and the t-table was 2,145, with a significance level of 5%. Thus, it can be

concluded that $t\text{-count} > t\text{-table}$, so H_0 is rejected and H_1 is accepted, indicating significant differences in student learning outcomes before and after using educational game-based learning media.

Discussion

The results of data analysis show that educational game-based learning media is effectively used to improve students' thematic learning outcomes. These results can be seen from subject content expert tests, instructional design expert tests, instructional media expert tests, individual trials, small group trials, and field trials. The validity test was carried out to know the feasibility of the product being developed before being implemented in the learning process. First, regarding the validation results of the expert aspect of learning content, the development of educational game-based thematic learning media obtained a percentage of 95.50% which is a very good percentage. The achievement of very good qualifications is influenced by several things, namely, the material aspects are following basic competencies, indicators, and learning objectives. Clarity and linkages of learning media with indicators and learning objectives will facilitate students learning so that learning objectives will be achieved (Dwiqi et al., 2020; Koning et al., 2019). Furthermore, in terms of convenience, the developed media contains aspects of images and text that are appropriate to the material, and the language used is clear and easily understood by students. The material presented in the media will be easy for students to understand if it begins with a concept presentation. It helps students understand the studied material more quickly (Abroriy, 2020; Coles, 2019). Besides that, using language that is by the characteristics of students and the Indonesian language rules of EYD will make young material understood by students (Purnasari & Sadewo, 2021; Widiastuti, 2021).

Second, regarding the validation results of the expert aspects of learning design, the development of educational game-based thematic learning media obtained a percentage of 88% which is in good qualification. Several factors, such as the attractiveness of interactive multimedia displays and the suitability of the material with learning objectives, influence these results. Interactive multimedia displays are designed according to the characteristics of elementary school students who tend to get bored quickly in learning activities. In the learning process, students' attention must be focused on teaching materials, for example, by making bright cover graphics with photos they like (adjusted to the level of student development) (Handayani & Abadi, 2020; Wulantari et al., 2019). Furthermore, regarding the suitability of the material with learning objectives, the material presented must pay attention to the design of appropriate learning objectives. The word design confirms that the material is deliberately designed for learning (Borman & Erma, 2018; Harris & Isyanti, 2021; Nirwana, 2021). What is designed is the content or teaching material manifested as objects or materials that can be used for student learning in interactive multimedia learning activities (Kurniawan et al., 2020; Panjaitan et al., 2020).

Third, regarding the validation results of the expert aspects of learning media, the development of educational game-based thematic learning media obtained a percentage of 94.67% which is a very good qualification. The achievement of these results is influenced by several aspects, such as the suitability of the selection of fonts/letters, the suitability of the images to support the material, and the appropriateness of the combination of text, images, sound, music, animated images, and videos. In media development, selecting fonts/letters can affect students' comfort in listening and interacting. The suitability of the use of type and size of letters that are adjusted to the characteristics of students will affect students towards the material presented (Puspita et al., 2017; Rahmawati, 2019). Furthermore, some images support the material in the developed interactive multimedia, especially sample images. Material supporting images have been designed to meet learning needs at the basic level. Communication conveyed through visuals, physical representation of messages conveyed in words, and messages presented through photos will help students absorb the messages (Aryawan et al., 2018). Using images in learning can help students understand learning topics, increase motivation, and improve learning outcomes (Amanullah, 2020; Weng & Chen, 2020). Using the right combination of text, images, sound, music, animated images, or videos will create a unity that supports each other in a media (Dwiqi et al., 2020; Sembiring et al., 2018; Widayatmojo & Muhtadi, 2017).

Fourth, in terms of the validation results of product trial aspects by student trials, the development of educational game-based thematic learning media obtained a score of 92.67% for individual trials with very good qualifications, 95.17% for small group trials with very good qualifications, and field trials 95.70% with very good qualifications. These results then show that educational game-based thematic learning media are classified as very good and suitable for use in the learning process at school (Nata & Putra, 2021; Rofiqoh et al., 2020). To achieve these qualifications, various variables can arouse students' interest and inspire them to be more enthusiastic about learning to improve learning

competence. The media used to convey learning messages are material or messages that stimulate active learning through images, text, sound, animation, and video. Educational games and media will make the learning process more fun and varied to motivate students to learn during the learning process in class (Andini & Fitriana, 2018; Linda et al., 2018). Using game elements in learning material can facilitate the acceptance of students' understanding and memory of the material they are studying (Buchori, 2019; Diyana et al., 2020).

The results obtained in this study align with previous research results, which also revealed that educational game-learning media is appropriate to be taught to children because it can improve language skills in early childhood literacy (Harris & Isyanti, 2021). The results of other studies also reveal that educational game media can combine visual, auditory, and kinesthetic learning styles to foster joy in children, especially in the learning process (Borman & Erma, 2018). The results of further research revealed that interactive games are suitable for use to develop aspects of language development in early childhood (Mardhotillah & Rakimahwati, 2021). Based on the research analysis results supported by previous research, educational game-based thematic learning media is appropriate for students because it can increase learning enthusiasm and outcomes.

4. CONCLUSION

Based on the results of the data analysis that has been carried out, it can be concluded that the development of educational games in thematic subjects in grade four is classified as very well-qualified and declared feasible to be used in the learning process. Thus the resulting product can be presented as one of the appropriate learning media for improving student learning competence.

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