

Development of Hypertext-Based Teaching Materials in Curriculum and Learning Courses during the Covid-19 Pandemic

Ira Arini, Dedi Aryadi, Usmaedi

STKIP Setiabudhi Rangkasbitung, Serang, Indonesia

Abstract

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This study aims to develop hypertext-based teaching materials during the Covid-19 pandemic so that they can effectively improve learning outcomes for Curriculum and Learning courses. The development of teaching materials follows the steps of developing the Rowntree model with the stages of preliminary research, development planning, validation, evaluation and revision (expert judgment review, face to face, filed test), and implementation. The value of product development obtained from the review of material experts is 3.12, instructional design experts are 3.68, and design and layout experts are 3.72. The average results obtained from the face to face and field tests are 3.55. At the implementation stage, the results of the pretest showed a value of 65.5 and the results of the posttest showed a value of 82.7. This shows that the product development of hypertext-based teaching materials is feasible to use and can effectively improve learning outcomes for Curriculum and Learning courses.

Keywords:

Hypertext Based, Teaching Materials, Covid-19

(*) Corresponding Author:

ira.arini@gmail.com

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INTRODUCTION

The enforcement of large-scale social restrictions has an impact on changing the face-to-face education system into an online or online education system to still achieve predetermined competencies. This change was tentative during the enforcement of large-scale social restrictions period and was so sudden that some educational institutions that used to apply face-to-face learning had to change it to online learning. The adjustment of this learning system requires the readiness of educational institutions to implement an online learning system including facilities and infrastructure, learning media, tools, learning plans and teaching materials that can support the application of online learning.

In practice, online learning has many obstacles. The lack of readiness of students and lecturers is one of the main obstacles experienced so that they only use the simplest facilities and infrastructure, namely using the Whatsapp application. Because they are not used to it and some have never carried out online learning, students feel shocked and lack focus so that the achievement of the competencies that have been determined has not been maximized. In the Curriculum and Learning course, students only focus on discussion forums on the WhatsApp application

without reading in more detail the lecture material and competency achievements of each meeting. In addition, internet access is difficult in various student areas, especially mountainous areas. The economic affordance of students who have not been able to buy excess quota in conducting online learning is also one of the obstacles faced. As a result, the competency achievement of the Curriculum and Learning courses has not been maximized, as evidenced by the average final score of students in 2020, which is 70.01, which is smaller than the average final score of students in 2019 is 82.25.

Careful preparation and readiness are needed in compiling online learning to achieve maximum competence. This readiness can be prepared based on problems regarding the details of the lecture material and the achievement of competencies in each meeting. Then, an analysis of the characteristics of students who are generally accustomed to learning face-to-face, economic conditions and the difficulty of internet access is carried out. Students need teaching materials that can facilitate online and offline learning based on the essence of the material by the achievement of competence at each meeting. Therefore, it is necessary to develop hypertext-based teaching materials in Curriculum and Learning courses during the Covid-19 pandemic so that students can easily review lecture materials by competency achievements both outside the network and inside the network.

Based on the background described above, some problems in this research are formulated as: (1) How to develop hypertext-based teaching materials in Curriculum and Learning courses during the Covid-19 pandemic? (2) Can the use of hypertext-based teaching materials effectively improve learning outcomes for Curriculum and Learning courses during the Covid-19 pandemic?

Curriculum and Learning courses are compulsory basic education courses for all education majors at the undergraduate level including the Physical Education study program at STKIP Setiabudhi Rangkasbitung, with a total of 3 credits (3x50 minutes) per week within 1 semester (16 meetings). This course aims to improve the quality of education personnel education graduates. After attending Curriculum and Learning lectures, students can implement all aspects of learning and learning theory in developing the school curriculum for the sport they are interested in.

According to the Law of the Republic of Indonesia Number 18 of 2002, it is stated that development is a scientific and technological activity aimed at utilizing proven scientific principles and theories to improve the functions, benefits, and applications of existing science and technology, or to produce new technology (Litbang, 2002). According to Seels and Richey in Miarso, development is the process of translating design specifications into physical form (Miarso, 2018). Richey and Klein in Emzir define development research as "the systematic study of design, development and evaluation processes to establish an empirical basis for the creation of instructional products and tools and new or enhanced models that govern their development" (Chinsya, 2017).

The development in this study is included in the area of educational technology development because the development process is purely based on existing steps starting from needs analysis until evaluation (Sumiaty et al., 2019). Development is also a type of mixed research because in its implementation it uses relevant methods, such as descriptive, evaluative and experimental research methods or combining qualitative and quantitative research types (Creswell, 2019).

Borg and Gall state that educational research and development is one of the processes used to develop and validate educational products (Suryani et al., 2014). The purpose of development research is to bridge the gap between educational research and educational practice. It means that development research has a very strategic role to utilize the results of basic research so that they can be used to improve the quality of educational practice. One of the product-based development models is the Rowntree development model which was developed in 1994 which initiated a model for the development of self-study materials (Sari & suryanti, 2022). According to Rowntree, there are three stages in developing learning materials, namely (a) planning stage, (b) writing preparation stage, and (c) writing and editing stage (Nugroho et al., 2019).

Teaching materials are materials or subject matter that are systematically arranged, which are used by teachers and students in the learning process (Harri Hidayat, Hartono, 2020). Teaching materials can also be interpreted as material that will be taught to students who have been selected or messages that must be studied and understood by students (Cooper, 2017). Based on this definition, it can be concluded that teaching materials are materials or subject matter that are systematically arranged, which are used by teachers and students in the learning process. According to Sitepu, the principles of developing teaching materials are validity, relating to the level of suitability or validity and testability of the material with competence, level of significance, utility, the possibility to be studied or learnability, related to the possibility of the material to be studied, both related to the availability and feasibility of the material to be studied and the ease of obtaining it, interest, related to the attractiveness of the material level, so that it can encourage and arouse students' learning passions to conduct various further studies. Hypertext system that supports nonlinearity, multidimensional media that can present complex problems that cannot be presented in traditional systems (Agustini, 2015).

Computer support and hypertext formats will be very helpful in a flexible instructional approach that allows students to access information according to their own needs. Hypertext-based teaching materials make it easy for students to access learning materials both online and offline and can focus on predetermined teaching materials (Arini, 2016). In addition, hypertext can also facilitate students to produce functional models related to general descriptions of curriculum and learning course materials. Based on the purpose of this research is to develop hypertext-based

teaching materials during the Covid-19 pandemic so that they can effectively improve learning outcomes for Curriculum and Learning courses.

METHODS

The enforcement of large-scale social restrictions has an impact on changing the face-to-face education system into an online or online education system to still achieve predetermined competencies. This change was tentative during the enforcement of large-scale social restrictions period and was so sudden that some educational institutions that used to apply face-to-face learning had to change it to online learning. The adjustment of this learning system requires the readiness of educational institutions to implement an online learning system including facilities and infrastructure, learning media, tools, learning plans and teaching materials that can support the application of online learning.

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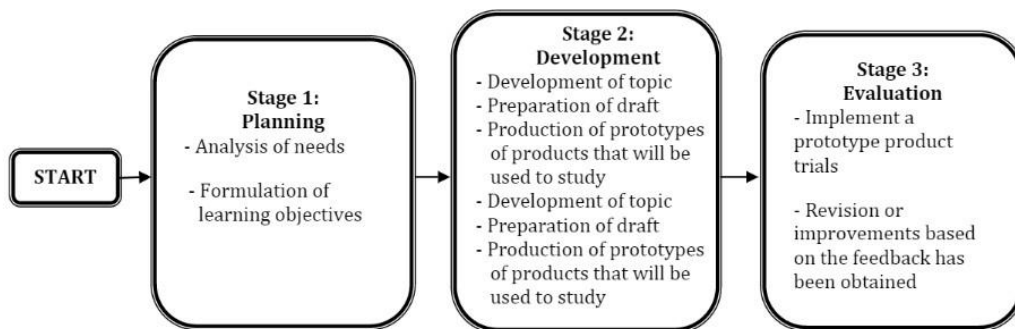


Figure 1. Rowntree Model

Based on the picture above, the stages of research carried out in developing hypertext-based teaching materials consist of 3 main stages: preliminary research, development planning, validation, evaluation, and revision. In the preliminary stage, an analysis of student learning needs was carried out in dealing with online learning during the co-19 pandemic. Then, the next stage of product development is based on the needs analysis in the previous stage. After developing the product, the next stage is validating expert reviews consisting of material experts, instructional design experts, and media design experts. If validation has been

carried out, the following research stage will evaluate the product by conducting small and large group trials. If there are some deficiencies in these processes, they will be refined with a revision process at the last stage.

RESULTS & DISCUSSION

Results

1. Preliminary Research

Preliminary research consists of a needs analysis phase which is carried out by identifying the ideal conditions and conditions that existed when the research was carried out. The ideal condition that should occur is that the competency achievement of the Curriculum and Learning courses gets a minimum score of B with a score range of 75-100.

The condition that existed when the research was carried out was that the competency achievement of Curriculum and Learning courses in 2020 got an average score of 70.01 or less than B. This condition is very different from the achievement of competency courses in previous years, namely in 2019 getting a score of an average of 82.25.

Based on this gap, some problems can be identified, namely the decrease in the achievement value of the curriculum and learning competencies. This decline can be analyzed from changes in the learning system from offline to online as well as all the obstacles such as signals, learning motivation, economic conditions, learning methods, and teaching materials that facilitate students to study independently online during the Covid-19 pandemic.

2. Development Planning

According to Sugiyono, development research has several stages, namely: 1) potential problems, 2) data collection, 3) product design, 4) design validation, 5) design revision, 6) product testing, 7) product revision, 8) trial use, 9) product revision and 10) mass production. The type of development design carried out is the type of Research and Development (R&D) research (Kartini et al., 2018). the type of teaching materials development model refers to the Rowntree development model (Apriani & Pasaribu, 2016). In the early stages of planning, it is done by designing learning regarding learning theory including the purpose of the product, the audience that uses it, as well as a description of the components of the product its use.

The purpose of the product in the form of hypertext-based teaching materials is to improve learning outcomes for Curriculum and Learning courses during the Covid-19 pandemic. Audiences who use hypertext-based teaching materials are students who contract Curriculum and Learning courses. The product component

of hypertext-based teaching materials is in the form of Curriculum and Learning course material which consists of 4 learning activities, namely: 1) learning and learning, 2) learning theories and their application, 3) motivation and 4) curriculum. In each learning activity, there are introductory sections, learning activities, summaries, formative tests, and answer keys.

The preparation of an expert review validation instrument was also carried out at this stage, namely by compiling a validation instrument for curriculum and learning subject matter experts, instructional design experts, and teaching materials design and layout experts.

The results of the product development design are in the form of hypertext-based teaching materials in the form of e-modules. Each learning activity in hypertext-based teaching materials is provided with a link for each of the sections mentioned above asynchronously so that students can easily access the teaching materials even though there is no internet network.

3. Validation, Evaluation, and Revision

The hypertext-based teaching materials that have been developed are validated by several experts or expert reviews, namely experts on Curriculum and Learning subject matter, instructional design experts, and module design and layout experts. Table 1 below is the recapitulation result obtained from expert validation:

Table 1. Recapitulation of Expert Validation Results

No	Aspect	Average (Scale 4)
1	Material	3,12
2	Instructional Design/learning design	3,68
3	Design and Layout	3,72

In addition to the results of the validation of experts in the form of numbers, several inputs greatly assist the evaluation process of product development of hypertext-based teaching materials, including 1) Carrying a flat design theme with a maximum composition of three colours on one page, 2) setting more specific learning objectives. specifically for physical education students, 3) create a grid of formative questions for each learning activity in the developed teaching materials. Based on the data above, a revision of product development was carried out according to input from experts because it could improve the product development process.

After carrying out evaluations and revisions based on expert validation, product feasibility trials were carried out in the form of face to face and field tests. The results of the face-to-face trial consisting of three respondents from active students who contracted Curriculum and Learning courses using open statement instruments are presented in the following table:

Table 2. Face to face Trial Recapitulation Results

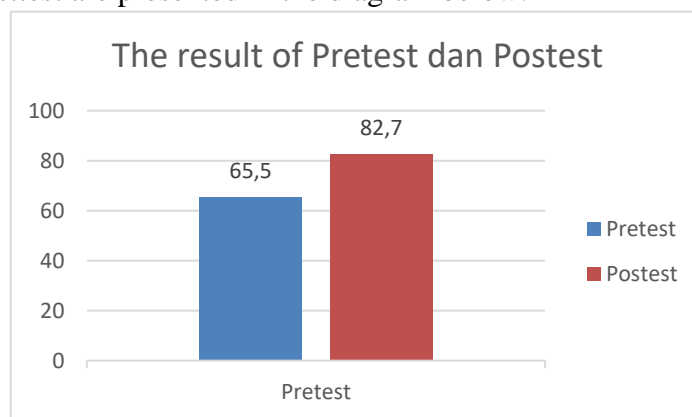
Dimension	Aspect	Respondent's Answer		
		R1	R2	R3
Learning Design	Learning objectives	Good	Good	Less informative
	Language Usage	Good	Good	Very good
	The list of material	Sequential	Sequential	Sequential
Learning materials	Readability of the material	Good	Material is too easy	Good material
	Test Items	Very good	Very good	Very good
Design	Layout	Very good	Very good	Very good
	Teaching material design	Very good	Good	Very good
	Font size	Readable	Readable	Too small
	The use of hyperlinks	Very helpful	Very helpful	Very helpful

The results of the field test trial consisting of 25 respondents who came from active students who contracted Curriculum and Learning courses using closed instruments on a scale of 1-4 are presented in the following table:

Table 3. The Results of Field Test Trial Recapitulation

No	Aspect	Average	Category
1	Learning objectives	3,50	Very Good
2	Language used	3,45	Very Good
3	The list of materiala	3,50	Very Good
4	Readability of the materials	3,25	Very Good
5	Test items	3,75	Very Good
6	Layout	3,25	Very Good
7	Design of teaching material	3,75	Very Good
8	Font size	3,50	Very Good
9	The use of hyperlink	4,00	Very Good
Average		3,55	Very Good

After carrying out the field test, revisions were made based on input from respondents. The product revision was carried out covering nine aspects, namely learning objectives, language use, material order, material readability, test items, layout, design of teaching materials, font size and use of hyperlinks. The product development that has been carried out until the field test trial stage will then be implemented in the Curriculum and Learning class with a total of 25 respondents for 1 semester. To measure the success of the implementation phase, it is carried out by carrying out pretest and posttest. The results of the implementation using the pretest and posttest are presented in the diagram below:



Graph 1. The result of Pretest dan Posttest

Discussion

The product resulting from this research is in the form of hypertext-based teaching materials that can be accessed online or offline from the internet network. The intended target or users of this product are all students of the Curriculum and Learning class. The research design that became the reference for the researcher was the Rowntree development with the following stages: preliminary research, development planning, validation, evaluation and revision (expert judgment review, face to face, filed test), and implementation.

Product testing is carried out for 1 semester in 2020/2021 even semester by distributing teaching materials at the beginning of the lecture to students. Then, the teaching materials are used during 1 semester of learning in the Curriculum and Learning course. To test the effectiveness of the teaching materials, a pretest was first carried out on the subject learning materials, then at the end of the lecturing section, a posttest was carried out. The results of the pretest and post-test explained that there was an increase in student learning outcomes after using hypertext-based teaching materials with an average final score of 82.7.

Based on this, it can be stated that hypertext-based teaching materials have proven to be effective in improving learning outcomes for Curriculum and Learning courses during the Covid-19 pandemic. This is due to the ease of accessing materials digitally, both offline and online so that it can motivate students to study

without the reason that the network or internet quota is inadequate. Research with similar objectives has also been carried out during the Covid-19 pandemic which has implemented learning management and has had a positive impact on teaching and learning activities despite being in a pandemic (Sulastrri et al., 2021).

The use of teaching materials is also very helpful for students to know their learning progress. The principle of independent learning anywhere and anytime in the realm of andragogy is very applicable. The teaching materials developed are also adapted to the needs of students who are limited in space and the internet adds value to this hypertext-based teaching material. Some of the weaknesses of existing teaching materials are still general and not adaptive to the surrounding environment and culture don't meet the needs of students (Proklawati & Susanto, 2021).

CONCLUSION

Based on the description that has been put forward regarding the development procedure and the development results obtained, it can be concluded that hypertext-based teaching materials were developed based on the research and product development procedures of the Rowntree model. This is based on the development process that has followed the development flow and procedures, as well as the results of the development that has gone through the stages of expert trials, face to face trials and field test trials.

Based on the results of the trial, hypertext-based teaching materials received an expert assessment of materials of 3.16, instructional design experts of 3.68, and module design and layout experts of 3.72. The results of the evaluation of the effectiveness of teaching materials after students take the Final Semester Examination to show an average achievement rate of 82.7 with the minimum criteria for achieving B value in the Curriculum and Learning course 75-100. In other words, hypertext-based teaching materials can effectively improve learning outcomes for Curriculum and Learning courses during the Covid-19 pandemic.

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