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Development of DORA Media (Interactive Video) on the Coordination System Materials of Grade XI Senior High School

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Abstract

This study aims to determine the feasibility and response of teachers and students to learning media DORA (Interactive Video) on the material of the coordination system applied to grade XI Senior High School. The approach used is qualitative with the type of development research (RnD) 4-D model which is limited to the dissemination stage. Retrieval of research data using a feasibility questionnaire and a response questionnaire. The data analysis technique used is descriptive statistics. The results showed that (1) learning media DORA (Interactive Video) is very feasible based on the assessment of media experts by 86%, material experts by 91%, language experts by 84%, and a readability questionnaire from the teacher by 85%, and students amounting to 83.89%; (2) the teacher's response is said to be very good with a percentage of 85%, and the response of students is said to be good with a percentage of 78.96%. Learning media DORA (Interactive Video) is packaged in the form of an android application so that it can be implemented in the classroom and online learning.

Abstrak

Penelitian ini bertujuan untuk mengetahui kelayakan serta respon guru dan peserta didik terhadap media pembelajaran DORA (Video Interaktif) pada materi sistem koordinasi yang diterapkan pada kelas XI SMA/MA. Pendekatan yang digunakan yaitu pendekatan kualitatif dengan jenis penelitian pengembangan (RnD) model 4-D yang dibatasi tidak sampai pada tahap desiminasi. Pengambilan data penelitian menggunakan angket kelayakan dan angket respon. Teknik analisis data yang digunakan adalah deskriptif statistik. Hasil penelitian menunjukkan bahwa (1) media pembelajaran DORA (Video Interaktif) sangat layak berdasarkan penilaian dari para ahli media sebesar 86%, ahli materi sebesar 91%, ahli Bahasa sebesar 84%, serta angket keterbacaan dari guru sebesar 85%, dan peserta didik sebesar 83,89%; (2) respon guru dikatakan sangat baik dengan presentase sebesar 85% dan respon peserta didik dikatakan baik dengan presentase sebesar 78,96%. Media pembelajaran DORA (Video Interaktif) dikemas dalam bentuk aplikasi android sehingga dapat diimplementasikan dalam pembelajaran dikelas maupun daring.

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A. Introduction

In the Industrial Era 4.0, the world of education is currently busy preparing a generation that can survive in various competitions (Syamsuar, 2018). The positive impact of rapid technological advances for the world of education is used to develop learning media (Muhson, 2010). According to Miftah (2013), the presence of learning media is very helpful for students in understanding the material during the learning process in class. Meanwhile, according to Supriyono (2018) psychologically learning media is very helpful for students in terms of learning because the media can make abstract things more visible. Arafah (2018), also argues that information technology-based learning media fully serve the learning needs of students, so that they are by current needs of students.

The use of various information technology-based learning media in the Digital Industrial Era 4.0 in schools is relevant because based on the results of interviews with biology teachers that have been conducted in three SMA/MA schools in the City and District of Blitar, it shows that schools are already using IT-based media in learning. According to Suryani (2016) with the development of IT-based learning media (especially the Internet) students can carry out learning activities such as learning in the classroom through virtual classes (virtual classes) in the form of e-learning. This is in line with the results of the questionnaire analysis of student needs which shows that during the learning process students can use smartphones with a percentage of 37%.

According to Widjayanti (2019), so that the learning process is more optimal, a learning media is needed that can make it easier for students to understand the concepts or material being studied; especially material that is considered difficult. Maisyura (2021) also argues that media in biology learning is needed so that students can understand the concept of biology in a broad sense. Based on the results of interviews with biology teachers in three SMA/MA schools in the City and District of Blitar, the learning media used or applied in schools is still in the form of PPT (PowerPoint). In addition, the obstacles experienced during the biology learning process are the lack of student motivation such as not paying attention during the learning process. The results of the questionnaire data in three SMA/MA schools in the City and District of Blitar with a sample of 168 from a total population of 423 also show that the material that requires learning media because it is considered difficult is the coordinate system with a percentage of 34%. Students have difficulty in understanding the material because the concepts are too complicated and too many.

Based on these data, it is necessary to develop learning media to improve student learning achievement, one of which is by using interactive videos packaged in the form of an android application. According to Dewi & Rimpiati (2015), the development of the cognitive, affective, and psychomotor domains of students can be stimulated by using learning media in the form of interactive videos. According to Agustien (2018), video learning media is rich in information and thoroughly conveyed to students directly so that it is very effective in helping the learning process. Meanwhile, according to Wardani (2018), the use of interactive video learning media can involve student's actively in learning and can make it easier for students to understand the material that is considered difficult.

B. Method

This type of research uses a qualitative approach oriented to product development. This research belongs to the type of Research and Development (RnD) research which is limited to the third phase (limited trial) only to find out the perceptions of teachers and students. The development model that the researcher uses in this study is a development adapted from the 4-D model and is limited so that it does not reach the dissemination stage. The data analysis technique used is descriptive statistics, while the technique for taking the sample is using Snowball Sampling. The research data collection uses a feasibility questionnaire and a response questionnaire as follows.

1. Eligibility Questionnaire

The feasibility questionnaire in this study consisted of a readability questionnaire and an expert validation questionnaire. The readability questionnaire grid can be seen in Table 1. The media expert validation grid can be seen in Table 2. The material validation grid can be seen in Table 3. The linguist validation grid can be seen in Table 4.

Aslamiyah (2017) argues that the purpose of the media readability questionnaire is to find out the level of teacher and student responses to the media that has been created. Meanwhile, according to Maskur (2017), the validation questionnaire aims to measure the feasibility level of a product development design before conducting product trials. Untayana (2016) also argues that validation aims to explore comments and suggestions both verbally and in writing by discussing the learning tools developed.

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Table 1 Readability Questionnaire Grid

Aspect	Indicator
Material coverage	a. Presentation of material to support learning objectives and add new insights.
	b. DORA learning media is useful in helping to learn and understand the coordination system material
Graphic design	a. Images and text are displayed.
	b. The video presented is appropriate and supports the clarity of the concept/material
	c. The display/background of DORA's learning media is interesting and can increase students' learning motivation.
Language	a. Interesting language and does not cause much interpretation.
	b. The language is straightforward, communicative, and easy to understand.
	c. Spelling according to Enhanced Spelling (EYD) guidelines.

(Source: modified from Jannah, 2013)

Table 2 Grids of media expert validation questionnaires

Aspect	Indicator
Coloring	a. Interesting color combination.
	b. The suitability of the presentation of images and the material discussed.
On-screen display	a. Pemilihan grafis background sesuia.
	b. The typeface is clear, appropriate, and legible.
	c. Matching display color and background.
	d. Placement and use of appropriate buttons.
Presentation	a. The presentation of video media supports students to be involved in learning.
	b. Coherent video media presentation.
	c. Presentation of images according to material exposure.
Voice	a. The voice is heard clearly
	b. The intonation of the presenter's speech in the video is easy to understand
Use	a. Ease of using media.
	b. The buttons on the media work fine.
	c. Media can be connected to youtube account.
	d. Media can be connected to google drive.

(Source: modified from Krismasari, 2015)

Table 3 Grids of material expert validation questionnaires

Aspect	Indicator
Material suitability	a. The suitability of the material with core competencies.
	b. The suitability of the material with basic competencies.
	c. The suitability of the material with the learning objectives.
	d. The suitability of the material with the students' thinking level
Material accuracy	a. Concept and definition accuracy.
	b. Accuracy of data and facts.
	c. Image accuracy.
	d. Accuracy of terms
	e. Source material accuracy.
Material clarity	a. Clarity of material description.
	b. Supporting image clarity.
	c. Clarity of practice questions given
Encourage curiosity	a. Encourage curiosity.
	b. Creating the ability to ask questions.
Material presentation	a. The material on DORA learning media is short, solid, and clear.
	b. The material on DORA learning media is coherent and appropriate.
	c. The material on DORA learning media is easy to understand.

(Source: modified from Krismasari, 2015)

The tabulation of the feasibility questionnaire assessment data is based on a Likert scale. According to Janti (2014), the Likert scale measurement is obtained using a respondent is given a statement and then asked to choose an answer from the five available answer options, where the answer values have different values. The scoring of the feasibility questionnaire can be seen in Table 5. The results of the feasibility questionnaire assessment obtained are interpreted in Table 6.

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Tabel 4 Kisi-kisi angket validasi ahli bahasa

Aspect	Indicator
Use of words and language	a. Use good and correct language rules. b. Using terminology according to the concept on the subject. c. Use simple and easy-to-understand language. d. Use communicative language. e. The accuracy of language selection in outlining the material.
Sentence usage and spelling	a. Using sentences that represent the content of the message or information to be conveyed. b. Use simple sentences and to the point c. Spelling accuracy

(Source: modified from Krismasari, 2015)

Table 5 Scoring on the eligibility questionnaire

Answer Options	Score
Strongly Agree	5
Agree	4
Disagree	3
Do not agree	2
Strongly Disagree	1

(Source: Adapted Sudaryono et al, 2013)

The percentage formula used is as follows.

$$\text{Percentage} = \frac{average\ number}{number\ of\ ideal\ values} X100\%$$

Table 6 Scoring on the eligibility questionnaire

Percentage	Category
0%-20%	Very Inappropriate
20%-40%	Not worth it
40%-60%	Decent enough
60%-80%	Worthy
80%-100%	Very Worthy

(Source: Adapted Sugiyono, 2016)

2. Response Questionnaire

The response questionnaire in this study consisted of a teacher response questionnaire and a student response questionnaire. The teacher response questionnaire grids can be seen in Table 7. The student response questionnaire grids can be seen in Table 8.

Table 7 The teacher response questionnaire grid

Aspect	Indicator
Material Presentation	a. The suitability of the material with Core Competencies and Basic Competencies b. Presentation of systematic coordination system material and makes students interested in participating in learning. c. Clarity and suitability of exposure to the coordination system material as a supporter of the achievement of learning objectives. d. The linkage of video reviews on each material.
Language Usage	a. Accuracy in the selection of font size and type. b. Efficient use of sentences. c. Spelling according to Enhanced Spelling (EYD) guidelines

(Source: modified from Junuawati, 2014)

Table 8 Grid of student response questionnaires

Aspect	Indicator
Interest	a. DORA learning media is interesting and makes learning Biology more enthusiastic. b. DORA learning media is easy to use and makes learning Biology not boring. c. The display on DORA learning media is interesting.
Material	d. The material is easy to understand and related to everyday life. e. Supporting pictures and practice questions are clear. f. The material is short, dense, and clear and can encourage students' curiosity.
Language	a. Writing and sentence structure is easy to understand and clear. b. The language used in DORA learning media is easy to understand.

(Source: modified from BSNP, 2014)

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Response questionnaires can be used to measure the extent to which teachers and students respond to interactive video learning media (Suseno, 2020). Tabulation of response questionnaire assessment data is based on a Likert scale. The score on the response questionnaire can be seen in Table 9. The results of the response questionnaire assessment obtained are interpreted in Table 10.

Table 9 Scoring on the response questionnaire

Answer Options	Score
Strongly Agree	5
Agree	4
Disagree	3
Do not agree	2
Strongly Disagree	1

(Source: Adapted Sudaryono et al, 2013)

The percentage formula used is as follows.

$$\text{Percentage} = \frac{average\ number}{number\ of\ ideal\ values} \text{X100\%}$$

Table 10 Scoring on response questionnaires

Percentage	Category
0%-20%	Very less
20%-40%	Not enough
40%-60%	Enough
60%-80%	Good
80%-100%	Very good

(Source: Adapted from Ridwan, 2013)

C. Results and Discussion

This study aims to develop DORA (Interactive Video) learning media on the material coordination system for grade XI SMA/MA. This research was conducted through three stages of development which include define, design, and development. The results of research that has been carried out in limited trials by using a research design through survey techniques are as follows.

1. Feasibility test

The feasibility test aims to produce a DORA (Interactive Video) learning media that meets the appropriate and valid qualifications based on the results of the assessment conducted by the validator. Assessment of learning media products is carried out by several experts or experienced experts. The characteristics of the DORA learning media (Interactive Video) are that this video is problem-based as a series of learning activities that emphasize the process of solving problems that are solved scientifically and packaged in the form of an android application with a capacity of 5.50 MB. Contains material for coordination systems in the form of animated videos containing text, still images, animations (motion images), and sound. DORA (Interactive Video) learning media can be connected to Youtube, Google Drive, and Google Classroom accounts.

Based on the interpretation of the questionnaire answers adapted from Sugiyono (2016), the teacher's readability test showed a percentage of 85% and students showed a percentage of 83.89% with a very decent category. In addition, the assessment that has been carried out by media experts shows a percentage of 86%, material experts show a percentage of 91%, and language experts show a percentage of 84% with a very decent category. This is in line with research conducted by Arafah (2018) which concludes that problem solving-based interactive video learning media to increase students' interest and learning outcomes in parabolic motion material is feasible and effective as a learning medium. Thus, the DORA (Interactive Video) learning media is considered very good so it is worthy to be used as a learning medium.

Wardani (2018) argues that interactive video learning media can help students understand the material more easily and make them more active when compared to when teachers use learning media in the form of images only (visual). According to Suseno (2020) the occurrence of more than one-way communication between teachers, media and students can use interactive video learning media. In addition, according to Agustien (2018), the use of video in visualizing material is very effective in helping teachers deliver dynamic material.

As stated by Munadi (2013), the media plays an important role in developing students' cognitive abilities. In addition, the achievement of learning objectives and the fulfillment of needs are the basis for consideration in the selection of media (Indriana, 2011). Therefore, with the use of appropriate learning media, the learning objectives can be achieved.

2. Test response

The importance of testing the responses of teachers and students is to find out and measure the extent of the responses or responses from teachers and students to the DORA (Interactive Video) learning media. The assessment based on the teacher's response questionnaire got a score of 85% in the very good category while the student response questionnaire got a score of 78.96% with the good category based on the percentage interpretation adapted from Ridwan (2013).

The response of teachers and students to the DORA (Interactive Video) learning media is said to be very good based on the results of the

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questionnaire response analysis of teachers and students. This is in line with the opinion of Daryanto (2018) that to provoke students during the learning process, media in the form of interactive videos is used. Students will respond to everything they see and hear so that the message from the content of the material contained in the DORA (Interactive Video) learning media will be studied by the student's brain. DORA learning media (Interactive Video) creates reciprocity in the form of problems regarding learning materials that will create interaction between students, teachers, and learning media.

The result of this development product is the DORA learning media (Interactive Video) on the material of the SMA/MA grade XI coordination system made using App Inventor 2. This learning media is in the form of problem-based interactive videos as a series of learning activities that emphasize the problem-solving process is solved. scientifically packaged in the form of an android application. Based on research conducted by Arafah (2018), it states that students can learn independently whenever and wherever so DORA (Interactive Video) learning media is worthy of being used as learning media in the classroom or independently for students. Thus, DORA (Interactive Video) learning media can help and facilitate students in learning and understanding the coordination system material.

This is in line with the opinion of Sanaky (2013), the benefits of learning media for teachers are as a guide in achieving learning objectives, explaining the structure and sequence of teaching efficiently, being able to describe teaching frameworks systematically, making it easier to master learning materials, helping accuracy in the presentation and delivery of material. learning, generating self-confidence, improving the quality of teaching, providing and increasing diverse learning variations, presenting core information systems to facilitate the delivery of material, and creating pleasant learning conditions and situations.

In addition, according to Arafah (2018), he argues that the benefits of learning media for students are to foster interest in learning, increase learning variations, stimulate students to think and analyze, create conditions and learning situations that are fun and without pressure, and students can understand the material. lessons are systematically presented so that they can affect student learning outcomes.

D. Conclusion

Based on the results of the explanation above, it can be concluded that the assessment that has been carried out by media experts shows a percentage of 86%, material experts show a percentage of 91%, and language experts show a percentage of 84% with a very decent category. In addition, the teacher's legibility test showed a percentage of 85% and students showed a percentage of 83.89% with a very decent category. Thus, the DORA (Interactive Video) learning media is considered very good to be used as a learning medium. Based on the assessment that has been done by the teacher, it shows a percentage of 85% in the very good category and the students show a percentage of 78.96% in the good category. Thus, this media can help and facilitate students in learning and understanding the coordination system material. The advice given based on this research is that DORA (Interactive Video) learning media will not only discuss the coordination system material but other biology subjects.

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