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Development of Contextual-Based Interactive Learning Videos Assisted by Edpuzzle on Electrolyte and Non-Electrolyte Solution Materials

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ABSTRACT

Education is one of the keys to the progress of a country and nation. Because education is a driver of improving the quality of human resources in order to be able to compete in the increasingly sophisticated competition of national life. Therefore, educational institutions must be able to carry out a more quality learning process. The rapid development of technology requires educators to be able to integrate technology in the learning process. The purpose of this study is to determine the feasibility, practicality and effectiveness of the use of contextual-based interactive learning videos assisted by edpuzzle on electrolyte and non-electrolyte solution materials. This research targets the problems that occur in SMA 11 Muaro Jambi Class XII Phase F. This research is a type of development research with the Lee & Owens model which consists of 5 stages (analysis, design, development, implementation and evaluation). Validation from material experts achieved an average score (93.33%), material validation achieved results (95%), teacher assessment questionnaire as practitioners reached (100%), and student assessment questionnaire reached (95.45%) with Very Practical criteria and (96%) with very effective criteria. The results of the study show that the use of contextual-based learning videos assisted by edpuzzle is feasible, practical and effective to be used as a teaching medium.

Keywords *Interactive Learning Videos, Edpuzzle, Contextual Teaching Learning.*

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INTRODUCTION

The process that occurs in the world of education is none other than the improvement of human resources, one of the goals of educational institutions stated in the Preamble to the 1945 Constitution is to become the shaping of the life of the nation. This goal can be achieved if it is supported by several factors that affect, such as the quality of education, the teaching methods used, the teaching materials used, the preparation of teaching materials, and the curriculum used (Rahmayanti, 2020).

Nadiem Makarim, Minister of Education and Culture, emphasized that the concept of "freedom of learning" that he initiated is an effort to realize freedom of thought. The existence of this policy gives great hope for educational institutions to explore and develop the quality of education (Darise, 2021). The Independent Curriculum also provides opportunities for teachers to use various educational tools, ranging from literacy tests, lesson modules, textbooks, and others (Ripandi, 2023).

Electrolyte and non-electrolyte solution chemicals are one of the many chemical substances that are abstract. This is because in this material there are free-moving ions that allow electrons to produce electrical conduction. And students cannot see directly how a solution can conduct electricity. If this explanation is given both theoretically and practically, it is difficult to encourage students' understanding (Amalia et al., 2020).

The use of learning materials can also help students understand the summary of the content. In addition, the use of learning materials must be in accordance with the subjects and materials to be taught. The use of the right material is one way to improve students' understanding of the concept of electrolyte and non-electrolyte solutions (Ripandi, 2023).

The contextual approach is a learning approach that connects learning materials with the context of daily life, both in the family, community, natural environment and the world of work, so that students can connect the knowledge they have to make the knowledge they have obtained and its application in daily life. Learning that connects subject matter with the context of daily life can provide students with a lot of experience in interpreting problems and may also foster various ideas in solving problems (Zakiah et al., 2019).

Based on the results of interviews that have been conducted with chemistry teachers at SMAN 11 Muaro Jambi, it was found that the school has implemented several learning media in the form of printed books, Power Points (PPT), learning videos that are aired through YouTube, especially in chemistry subjects. However, the learning media used is still not effective in improving students' understanding. Like the use of learning videos, most students if they watch learning videos easily get bored and most of the material is skipped, so that the explanation of the material is not listened to in its entirety.

To fully understand material phenomena, electrolyte and non-electrolyte solutions must be visualized microscopically. This can be packaged in an animated format so that it allows learning media in the form of interactive learning videos. Interactive learning videos are learning media that combine

elements of audio, motion, images, text, and graphics to connect learning media with users.

Edpuzzle is a platform that allows teachers to deliver educational materials through interactive videos. Through interactive learning videos assisted by edpuzzles, teachers can insert questions into several parts of the video. If there is a question, the automatic video stops and returns when the student answers. This question can be a way for students and teachers to interact actively and allow teachers to see which students have listened to the video to the end (Siti Rohmah Kurniasih et al., 2023).

Based on the results of the student needs questionnaire, 84.9% of students stated that electrolyte and non-electrolyte solution chemical materials are difficult to understand. The Criteria for Achievement of Learning Objectives (KKTP) in class XII Phase F is 75 and the percentage of achievement of students in electrolyte and non-electrolyte solution materials is 55%. This is due to the lack of understanding of the concept of the material and students are reluctant to repeat the learning that has been learned before.

Therefore, the researcher is interested in developing a learning medium in the form of interactive learning videos. Through this research, it is hoped that it can overcome students' difficulties in learning chemistry, especially electrolyte and non-electrolyte solution materials, and can help students learn independently at home without knowing time.

RESEARCH METHOD

In this study, a type of Reasearch and Development with a development model by (Lee & Owens, 2004) consists of several stages, namely analysis which consists of need assessment and front-end analysis, design, development, implementation and evaluation.

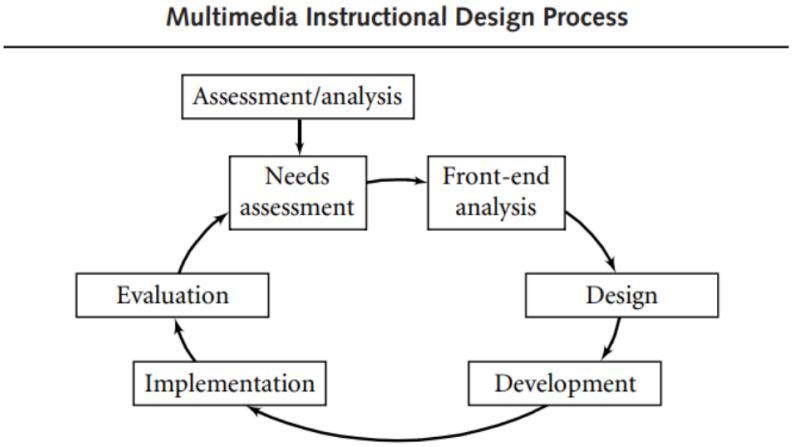

Figure 1.
Lee & Owens Development Model

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Test Subject

The test subject in this study is a small group test consisting of 10 students in class XII phase F1 B SMA N 11 Muaro Jambi

Data Analysis Techniques

For feasibility and practicality tests, by material experts, media and teachers based on the average response score with the following formula:

$$Average\ scor = \frac{Number\ of\ scores}{Number\ of\ items}$$

With this formula, it can be concluded with the criteria that can be seen in the following table:

Table 1.
Categories of Validation of Material and Media Experts

Average answer score	Validation Classification
>4,2 – 5,0	Highly Worthy
>3,4 – 4,2	Proper
>2,6 – 3,4	Less Worthy
>1,8 – 2,6	Not Worthy
1,0 – 1,8	Very Unworthy

(Widoyoko, 2018)

Table 2.
Criteria for the Practicality of Teacher Assessment

Average answer score	Validation Classification
>4,2 – 5,0	Very Practical
>3,4 – 4,2	Practical
>2,6 – 3,4	Less Practical
>1,8 – 2,6	Impractical
1,0 – 1,8	Very impractical

Modified from (Widoyoko, 2018)

The following formula is used to calculate the level of student response:

$$\mathbf{K = \frac{\Sigma F}{N \times I \times R} \times 100\%}$$

Average answer score	Validation
>80 – 100	Very Practical
>60 – 80	Practical
>40 – 60	Less Practical
>20 – 40	Impractical
0 – 20	Very impractical

Modified from (Widoyoko, 2018)

RESULT AND DISCUSSION

The results of this development research are in the form of contextual-based interactive learning videos assisted by edpuzzles on electrolyte and non-electrolyte solution materials based on the Lee & Owens (2004) development model.

Analysis Stage

In the analysis stage, the researcher used a questionnaire consisting of a questionnaire on the needs and characteristics of students given to Class XII F1B students and interviews with chemistry teachers of SMA N 11 Muaro Jambi.

Needs Analysis

A needs analysis was carried out to find out what are the sources and teaching media used by students. As well as to find out the problems experienced by students during the learning process. The results of interviews and questionnaires show that students at SMA N 11 Muaro Jambi need teaching media that can increase students' interest and motivation to learn so that they can learn independently without knowing the time and place.

Analysis of Learner Characteristics

As a prerequisite for achieving learning objectives, an analysis of student characteristics is carried out to obtain information about the initial level of student performance. The characteristics analyzed include the characteristics of students, skills, interests, experiences, and learning styles. The analysis of student characteristics was carried out through a questionnaire of student needs taught by 31 students of class XII F1B. The results were 80.7% stated that they were more motivated to learn when the material was presented in the context of daily life.

Objective Analysis

The objective analysis is carried out to find out the basics needed to develop a learning tool. When creating this product should be consistent with the curriculum and the basic skills that learners will learn.

Material Analysis

This material analysis can be carried out based on the curriculum used at SMA N 11 Muaro Jambi, especially in grade XII. The curriculum used is an independent curriculum, so that the material included in the learning media is developed in accordance with the competencies that students need to master.

Based on the results of the analysis of the student needs questionnaire, it is known that as many as 48.4% of students are interested in and like electrolyte and non-electrolyte solution materials, and as many as 83.9% of students are quite difficult to understand electrolyte and non-electrolyte solution materials.

Educational Technology Analysis

Educational technology analysis examines all aspects needed to use the products produced as learning media. In this case, the equipment and infrastructure needed to use learning media are checked first. The availability of school facilities and infrastructure in supporting learning through media such as internet connections that stable, computers, and projectors are adequate.

Design

The planning stage of this research is carried out by the process of making a design which will then be developed a contextual-based interactive learning video product assisted by edpuzzle on electrolyte and non-electrolyte solution materials. This design stage includes the determination of learning objectives, the design of products and materials, the collection of material materials and the preparation of assessment instruments.

Development

At this stage, the development of learning videos based on flowcharts and storyboards that have been designed previously is carried out. In this step, use the canva app. The development of this learning video combines text, images, animations, quizzes and educational videos with the theme of electrolyte and non-electrolyte solutions to illustrate the material. After the product development stage is complete, the next step is to validate it by a team of validators and practitioners. This validation phase is important in the development process, as it aims to assess product quality and suitability with needs. Based on the results of the validation of the material experts, the percentage was 93.33% with the category of "Very Feasible". And the results of the validation of media experts obtained a percentage of 95% with the category "Very Feasible". Based on the results of the assessment and the teacher's response, the percentage was 100% with the category "Very Practical" so that it could be tested on students.

Implementation

This implementation is a real step in the implementation of interactive learning video products that have been developed contextually-based. At this stage, the product is tested to collect data on the quality of the product that has been developed. The revised product and declared feasible by validators and teachers was tested in a small group of 10 students in class XII phase F1 B. In this trial, two questionnaires were used, namely a practicalist questionnaire and a questionnaire on the effectiveness of the developed media. Based on the student response questionnaire, it was obtained that the percentage was 95.45% with the "Very Practical" category and the percentage was 96% with the "Very Effective" category.

Evaluation

The evaluation stage is the process of determining whether the learning media made is successful and meets initial expectations. Evaluation by media experts and material experts in product validation. The product is revised based on the advice and opinions of experts, the valid product is then assessed by the teacher as the user. This assessment is called formative assessment because it meets the needs of revision. Once the product is confirmed to be good, it is tested in small groups. Summative evaluation is an evaluation that analyzes student responses as product evaluations.

CONCLUSION

Based on the data obtained, it can be concluded that the contextual-based interactive learning video assisted by edpuzzle on electrolyte and non-electrolyte materials developed obtained "Very Feasible" results from material experts and media experts. This result was obtained after several improvements that were later revised back by the developers. Then obtained the result of "Very Practical" from the teacher's assessment. As well as obtaining "Very Practical" and "Very Effective" results from student responses.

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