The Development of "Poster Equipped with Video (POSEVI)" on Fluids at Rest Topic for 11th Grade Students

Karunia Puji Lestari[a], Hadi Nasbey[b], Raihanati[c]

Department of Physics Education, Faculty of Math and Science, Universitas Negeri Jakarta, Rawamangun Muka Street No. 1, Rawamangun, East Jakarta City 13220, Jakarta, Indonesia

✉: [a]karuniaaa17@gmail.com, [b]hadinasbey@unj.ac.id, [c]raihanati0608@gmail.com

Abstract

This study aims to develop products such as "Poster equipped with Video (POSEVI)" that worth to used as a physics learning media for high school students with fluids at rest material. POSEVI is an educational poster equipped with educational videos, so the students shall receive visual learning (through poster) and audio-visual learning (through video). The videos contained by POSEVI can be accessed by scanning QR Codes printed on the poster. POSEVI was designed by using the research & development method that looked up to the ADDIE development model. At the beginning of this research, the need assessment questionnaire had shared as early research. In the Design stage, we should have inserted the material and contents into the poster and video. Then, in the Develop stage, POSEVI was validated by expert validators to learn how feasible the product is according to the result from expert validators. By the implementation stage, the field test was conducted limitedly by involving the XI grade students to learn about POSEVI's feasibility as a learning media after revising and correcting from the expert validator. The final of this research is an evaluation by revising that one may accomplish POSEVI as physics' learning media compatible with students.

Keywords: poster, video, fluids at rest

INTRODUCTION

In this modern era, we have seen the improvement in education. We have learned the fact that many teaching media have been created. We realize that the development of learning media can help either students or teachers to aims the learning goals (Rivai 2013; Musfiqon 2012). Learning media provides positive effects for learning activities, such as creating an exhilarating learning atmosphere and motivating students (Sanaky 2013). According to Rusman, learning media can be visual, audio, and audio-visual (Rusman 2011). One of the most popular learning media is the poster.

Students can use the poster as one of the learning media for teaching. According to Daryanto (2010), the educational poster is a learning medium purposely filled with many learning subjects. The poster is presented as a printed paper containing learning matters such as illustrations, pictures, tables, and some words as an explanation. Visual combination inside the learning poster attracted students to the learning materials (Megawati 2017). Research conducted by Lynsey J. Martin et al. (2018) about the infographic (poster) role for summarizing medical literature showed that posters were preferred to text-only article summaries.

Poster as a learning media contains many pictures, illustrations, tables, and explanation text, all on a sheet of paper; this leads to the lack of spacing in a piece of a paper poster. It makes all the learning materials unable to fit on the part of a paper. The poster can be equipped with a video to enhance the visual experience that students get during their studies. Educational videos were chosen as an additional media referred to Dale's perspective (cone of experience) about people having their impression. Dale's stated that their sense of sight obtained less than 30 % of people's knowledge, 20 % by their sense of hearing, and 50 % by sight and hearing (Rusman 2013).

Furthermore, educational videos used to be worth learning media as said by Rosi Wahyana (2018) about creating educational videos on Units and Measurement, and the research was proven that animations, sounds, and motion effects inside the videos could help the learning activities by attracting the students' learning motivation. Also, it would be much easier for students to learning by using videos anytime, anywhere. In addition, with a certain approach, even though online learning using interactive demonstration will increase students' critical thinking abilities (Nafingah et al. 2020). Adding some educational videos became the solution to this problem. The students need to scan QR codes printed on the poster to get access to the educational videos. These purposes are almost the same as those found in AR-equipped textbooks (Bakri et al. 2019). Cynthia Brame (2019) reveals that the educational video supports learning activities such as explaining and illustrating the learning materials. Any learning materials can be delivered as creative messages through educational videos as either audio or visual media (Cepi 2007).

The selection of physics subjects for which posters will be produced is made through a needs analysis. The need analysis through 33 student representatives from high school contributes by expressing their opinion. Most of the states that physics and fluids topics have been so hard to understand, so there must be such an exciting learning media as a tool to raise their learning motivation. Generally, the textbook was the most used learning media for educational purposes. However, almost all the students answer that they want creative learning media that contain pictures, videos, and exciting designs. Therefore, this research was undertaken to fulfill what the students need. So, this research aims to create a creative learning media that hopefully can raise students' learning motivation and easily understand the learning materials.

METHODS

This study uses the Research and Development Method to gain a valuable new product like learning media (Mulyatiningsih 2011). Meanwhile, this study refers to the ADDIE development model that includes five procedural stages: Analyze, Design, Development, Implement, and Evaluation (Branch 2009). The ADDIE development model has been chosen because it was commonly used to develop educational products (Aldoobie 2015).

Referring to the ADDIE development model, the initial step is to analyze by spreading the need assessment questionnaire to 33 high school students. Based on the result of the need assessment, we got the choice to choose an educational poster equipped with educational videos that can be accessed by scanning the QR Codes inside the poster. Also, we select the topic of Fluids at Rest.

At the Design stage, some contents and designs for the Fluids at Rest material are made, including the poster and the videos. Some software such as Adobe Photoshop CS6, Background Eraser, Phonto, and PicsArt was used in the design process for making the poster. At the same time, the software used for video editing in Movie Maker, KineMaster, Lexis Audio Editor, and InShot.

After the design of the poster and the videos had been made, the next step is Development. The product is validated by expert validators such as physicists and media experts to determine the feasibility. After the assessment by the expert validators is carried out, the product will be under revisions to getting the improvement until the product is declared feasible. The next step is the Implement stage which is carried out at SMAN 14 Jakarta, involving several students of 11th graders to find out the suitability of POSEVI as a learning media after going through improvements by suggestions and comments from expert validators. The last stage is evaluating the final results of the product so the teacher can use it for high school students.

The data obtained from the assessment by expert validators at the Development stage and the assessment by students at the Implement stage are processed using calculations that refer to the Likert scale with points 1 to 5 (Sugiyono 2015).

TABLE 1. Scales for research instruments

Alternative Answers	Score
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

Quality of the product measured by using the Likert Scale.

TABLE 2. Measurements of the Likert Scale

Percentages	Measurement
0% - 20%	Strongly Unlikely
21% - 40%	Unlikely
41% - 60%	Neutral
61% - 80%	Likely
81% - 100%	Strongly Likely

TABLE 1 describes the scale used in material validation instruments, media, and learning videos. TABLE 2 describes the interpretation of the results of the validation tests performed.

RESULTS AND DISCUSSION

The product of this study is a learning media called POSEVI (Poster Equipped with Video). The size of the poster is A2 paper size (42 cm x 59.4 cm). The measure was chosen by considering several things such as portability, the advantage we can take from a piece of paper that does not require much space and is suitable for display on the walls. The poster is designed using Adobe Photoshop CS6, Background Eraser, Phonto, and PicsArt. Educational videos are added to complete the limitation of the poster's material. Students can access the educational videos by scanning the QR Code inside the poster. So, students can watch the videos on cell phones easily. The videos on the poster each have a duration of fewer than 5 minutes. The video editing process is conducted using Movie Maker, KineMaster, Lexis Audio Editor, and InShot.

The learning materials in the POSEVI (Poster Equipped with Video) of the topic Fluids at Rest include an explanation of fluids, density, hydrostatic pressure, Pascal's Principle, and Archimedes' Principle surface tension, capillarity, and viscosity.
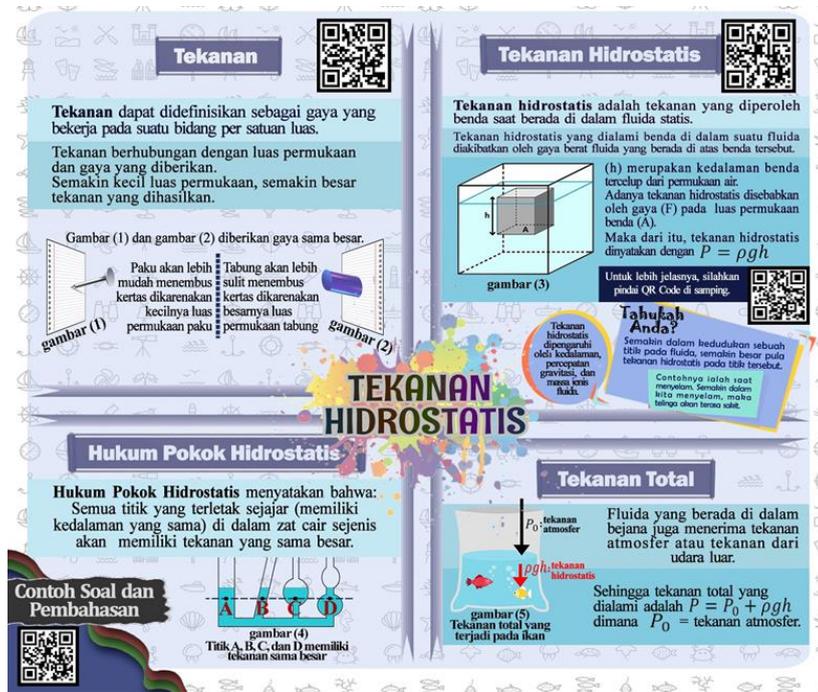

FIGURE 1.a. POSEVI part 1

FIGURE 1.b. POSEVI part 1

Poster part 1 contains materials including an introduction to static fluids, density, and hydrostatic pressure, as shown in FIGURE 1. The design is also equipped with QR Codes connected to the educational video. To access each video, students must scan the QR Code by using various QR Code scanners such as the LINE Messenger application, the default mobile application, and other QR Code scanner applications that can be downloaded via Playstore or IOS
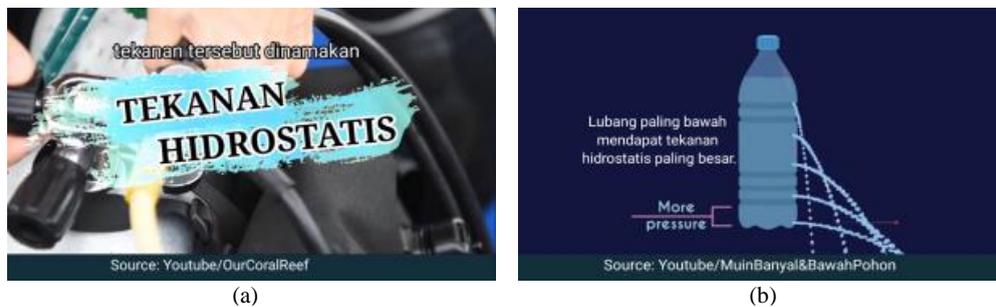

| (a) | (b) |

FIGURE 2. (a) Display of the video (b) The illustration of hydrostatic pressure that contained in the video
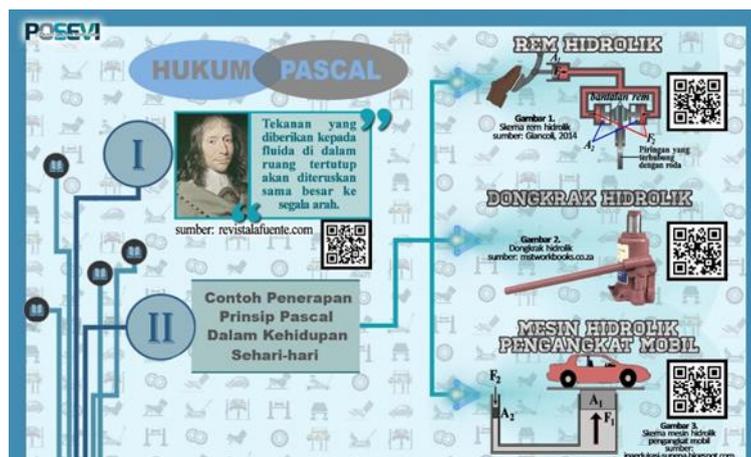

FIGURE 3.a. POSEVI part 2

FIGURE 3.b. POSEVI part 2

POSEVI part 2 contains materials including Pascal's Principle and Archimedes' Principle as shown in FIGURE 3. The design is also equipped with QR Codes connected to the educational video.

The contents that cannot be contained inside the poster are channeled by utilizing the educational video as shown in FIGURE 2. Inside the video, there is an illustration along with a narrative that explains the content. With the use of audio-visual media, the lesson will be easier to understand (Rusman 2011).
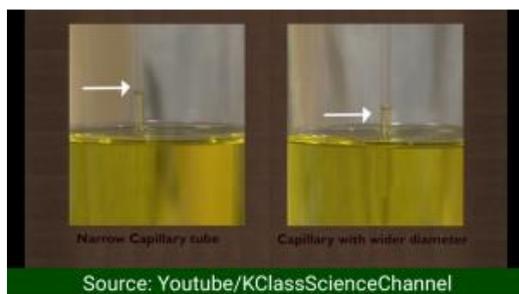

(a) (b)

FIGURE 4. (a) Display of the video (b) The illustration of hydrostatic pressure that contained in the video

The videos on this poster are presented with content containing experiments, illustration videos, narration, music, and explanatory text, as shown in FIGURE 4. The explanation in this video is also equipped with subtitles. So, students who watch the video can focus on listening and reading the subtitles containing the material explanation from the narrator.
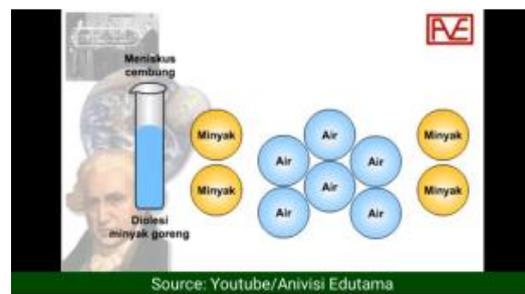
(a) (b)

FIGURE 6. (a) Display of the video (b) The illustration of hydrostatic pressure that contained in the video

Developing an educational poster equipped with educational videos (POSEVI) on the Fluids at Rest topic helps students carry out learning activities and assist teachers in teaching. The educational poster can increase interest in learning and help the students understand the lesson (Zahara 2016; Wulandari 2017). Audio-visual media such as educational videos through the QR Code also encourages students to avoid boredom (Wahyana 2018). Displaying videos are also a feature that technology greatly influences the learning process (Giannakos 2016). Even Students report that they welcome and value learning experiences integrated with technology. Students generally have a positive attitude towards technology and its use in learning (Tai and Ting 2016).
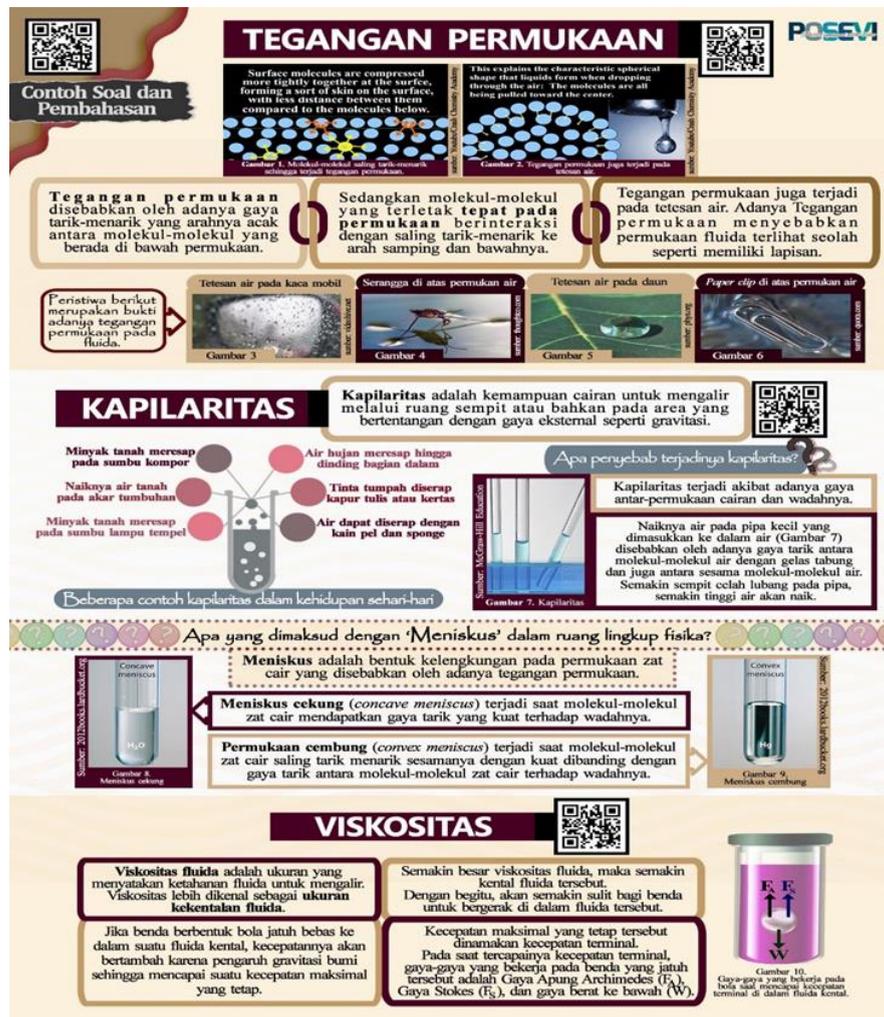

FIGURE 5. POSEVI part 3

Part 3 of the poster contains surface tension, capillarity, and viscosity, as shown in FIGURE 5. Also, there were QR Codes connected to the educational video.

CONCLUSION

A product has been developed as a learning media called POSEVI (Poster Equipped with Video), which can increase interest in learning and help students understand the lesson. The educational poster, which contains educational videos, can be easily carried or displayed on a wall. Thus, posters can be used as a source of individual uses and for teaching and learning activities in class. The development of POSEVI (Poster Equipped with Video) can generate students' motivation for learning, helps students to understand the lesson, and make it easier for students to learn. Posters generally contain content limited to display on the poster. The development of posters linked to videos makes it possible to insert complete material.

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