

# HASIL CEK\_7. Developing the physics magazine

*by 7. Developing The Physics Magazine*

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## 5 Developing the physics magazine as an alternative of personal learning media

D Sulisworo\*, A Ristiani and D A Kusumaningtyas

Department of Physics Education, Universitas Ahmad Dahlan, Yogyakarta, Indonesia

\*Corresponding author's email: dwi.sulisworo@uad.ac.id

**Abstract.** Recently, information technology literacy of the student in school is relatively high. Efforts to provide learning services that match the characteristics of the millennium generation will be one of the solutions to utilize this technology effectively in learning. Various open educational resources will significantly enhance personal learning activities; one of them is the physics magazine. This study is development research that aims to produce physics magazine on the subject of momentum, impulse, and collision. Learning features provided in this magazine include reading the concept, enrichment reading, crossword puzzles, multiple choice, essays, practicum, and so on. Various alternative activities are provided so that students can learn from anywhere they like. Physics experts and media experts validate this media. The result scores are 3.67 for the physics subject aspects and 4.18 for the media aspects out of 5. It shows a reasonable level of eligibility. Furthermore, this magazine was piloted on 26 students to see the level of interest in physics learning using this magazine. The result is a high level of interest (4.27 out of 5). It means that student can use this physics magazine to enhance the learning interest in physics.

### 10 Introduction

The development of information and communication technology has affected various sectors of life including education. This development is also a factor in the changing patterns of the social life and interaction of the community [1]. In the field of education, this pattern can be seen in the behavior of students related to the use of digital technology in various devices or gadgets. The level of virtualization of interaction between students and also with other communities also influences how students gain knowledge from cyberspace or the internet. Students tend to be more comfortable with virtual social interaction through various applications on their gadgets. This interaction is the concern of educators to find out the learning strategies that are appropriate to the level of student needs to build their character. Numerous research efforts have been conducted to adapt this technology in learning [2, 3]. However, there are still many aspects that need to be studied to see various opportunities in developing learning strategies utilizing this technology.

One of the characteristics of students in the recent era in obtaining and processing information is practicality and speed [4, 5]. With these characteristics, in understanding information students tend to be superficial at first and will explore deeper from other sources when the news is exciting and beneficial to them. These characteristics arise because recently students are much more accessible in obtaining information both broadly and in depth by using existing search engines. Concise information



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presentation will be a window for students to explore more in-depth knowledge of various information networks available on the internet [6]. This information presented in learning can be expressed in the form of a digital magazine fostering interest in exploring more profound knowledge by surfing the web.

Considering digital technology opportunities and student characteristics today as explained previously, this research aims to develop digital magazines that are interesting in physics lessons. The interest in concise and compact physics magazines is expected to fulfill students' characteristics. Furthermore, this magazine can encourage students to explore other relevant information in the cyberspace so that in-depth understanding can be obtained.

## 2. Methods

### 2.1. Design

This research is development research to produce a product in the form of physics magazines on the learning subject of momentum and impulse. The stages of development are needed analysis, preliminary design, validation by experts (learning technology experts and subject matter experts), and product trials by users or student's response.

### 2.2. Instrument

The questionnaire was used as the instrument to validate the product. Indicators for the learning technology aspect include 3 factors (language, appearance, and layout) covering 35 items. The element of the subject matter indicator consists of 7 factors (information completeness, supported activities, using current information, improving student thinking skills, fostering student to know further, use standard unit and notation, and considering usefulness aspects) containing 22 questions. The questionnaire for student's response covers 5 factors (complete subject matter, activities attractiveness, readability and language, physical appearance, and ease to use) including 20 items. The Likert rating scale is used to measure the expert judgment and the student's response too (5: Strongly Agree, 4: Agree, 3: Neutral, 2: Disagree, 1: Strongly Disagree).

### 2.3. Participants

There were two learning technology experts and two subject matter experts to validate the magazine. After the magazine is validated by experts and declared eligible for use, then the magazine is used by the teacher in learning activities. Learning activities on this topic are carried out in 6 meetings (2 meetings per week, 45 minutes per session). There are 26 students involved in the learning process. At the end of the learning, students are given a questionnaire to provide a response related to the level of independence of their education by using this magazine.

## 3. Result and Discussion

### 3.1. Magazine characteristics

This magazine contains 31 pages for the subject matter of momentum and impulses. Some significant findings of this product are as follows.

3.1.1. *Various information types.* The scope of the content of this magazine includes the description of concepts and theories, examples of applying concepts and theories in real life, figures and news related to topics, various types of exercises and deepening activities (practicum, crossword puzzles, matchmaking, and essay questions). With content variations, this is expected to foster student interest and learn to be more dynamic [7, 8]. Figures 1 and 2 show a screenshot of the magazine contents.



Figure 1. The magazine cover.



Figure 2. Some of contents.

3.1.2. Contextual examples. Contextual learning is currently considered to bring students' understanding closer to the actual situation or phenomena [9]. With this approach, students can gain in-depth knowledge [10]. In this magazine, some materials are presented relating to various real-life events. Some of them are shown in Figures 3 and Figure 4 below.



Figure 3. The example of the physics concept implementations in real-life.



Figure 4. The explanation of the real-life phenomenon using the physics concept.

3.1.3. Interesting pictures. The advantage in magazines is to display images with high resolution and choice of images affecting the reader [11]. For this reason, in this magazine, we selected images that encourage students' interest in physics learning both in general or specific issues. Figure 5 shows the general issue associated with Isaac Newton's biography. While Figure 6 shows a specific issue related to practicum activities that enforce to understand a particular phenomenon better.



Figure 5. The used of picture on the magazine (1).



Figure 6. The used of picture on the magazine (2).

3.1.4. Games as evaluation tools. Learning feedback is obtained through various exercises done by students. In this magazine, the tasks as a form of evaluation are presented in multiple kinds of games which encourage critical thinking [12, 13]. Figure 7 shows the exercises in the way of searching for words related to learning subject. Figure 8 shows the game in the form of a crossword puzzle with questions related to one.



Figure 7. Words searching game.



Figure 8. Crossword puzzle.

### 3.2. Expert validation

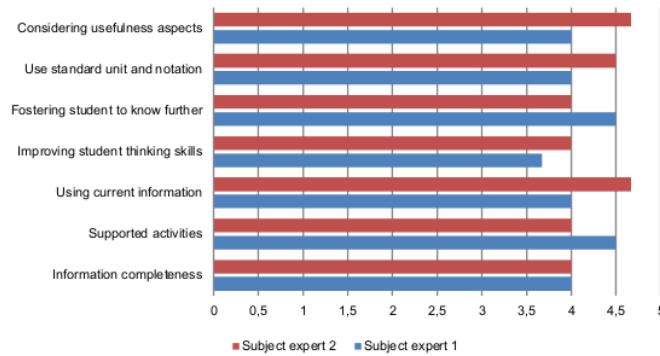
Figure 9 shows the validation result from the learning technology expert based on the questionnaire. It describes that from the validity questionnaire given to learning technology experts, the average of all items of the feasibility level was 3.67 out of 5 (3.64 from the first learning technology expert and 3.7 from the second one) with a deviation of 1.68%.





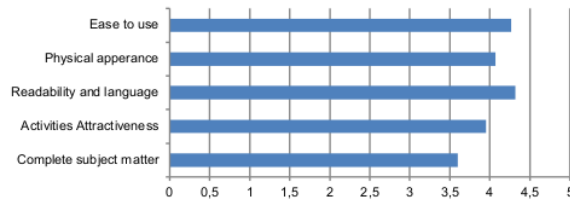
**Figure 9.** The validation from learning technology expert.

Figure 10 shows the validation result from the subject matter expert based on the questionnaire. Whereas from the subject matter expert obtained the average of all items the level of feasibility is 4.18 out of 5 (4.1 from the first subject matter expert and 4.26 for the second one) with a deviation of 4.00%. From this result, the feasibility level of both the media and subject matter aspects is in the proper criteria and can be used as learning media.



**Figure 10.** The validation from subject matter expert.

Furthermore, this media is used in learning independently for six lesson times (2 times per week for 45 minutes each). At the end of the learning, students (26 respondents) were given a questionnaire related to the response of the self-learning using this magazine. The result is shown by figure 11.



**Figure 11.** The student response to the media.

From the questionnaire obtained, it can be seen that the level of student satisfaction using magazines for independent learning is 4.27 (very satisfied) out of 5 with a standard deviation of 3.35%. This satisfaction rate is relatively very high. In further research needs to be studied how this level of satisfaction will affect the learning achievement by using this physics magazine.

#### 4. Conclusion

In today's innovation in physics learning, the use of ICT becomes relatively significant. The development of physics learning media using ICT is one alternative to support this innovation; one of them is the physics magazine. This physics magazine can also be used for independent learning. Some of the advantages of physics magazines for increasing learning interest are various information, contextual examples, inspiring images, and games as learning evaluations. The results of the validation by learning technology experts and subject matter experts indicated that this physics magazine is in a suitable category. The results of student responses when using this magazine to study independently are very satisfied. So that in general, this physics magazine can be used in learning activities.

#### 5. References

- [1] Sulisworo D 2013 The paradox on IT literacy and science's learning achievement in secondary school. *International Journal of Evaluation and Research in Education (IJERE)*, **2** 4 149-152
- [2] Tondeur J, van Braak J, Ertmer PA, Ottenbreit-Leftwich A 2017 Understanding the relationship between teachers' pedagogical beliefs and technology use in education: a systematic review of qualitative evidence. *Educational Technology Research and Development*, **65** 3 555-575
- [3] Sulisworo D and Toifur M 2016 The role of mobile learning on the learning environment shifting at high school in Indonesia. *International Journal of Mobile Learning and Organisation*, **10** 3 159-170
- [4] Zahrani H A and Laxman K 2016 A critical meta-analysis of mobile learning research in higher education. *Journal of Technology Studies*, **42** 1 2-17
- [5] Hao S, Dennen VP and Mei L 2017 Influential factors for mobile learning acceptance among Chinese users. *Educational Technology Research and Development*, **65** 1 101-123
- [6] Leckie G J, Pettigrew K E and Sylvain C 1996 Modeling the information seeking of professionals: A general model derived from research on engineers, health care professionals, and lawyers. *The Library Quarterly*, **66** 2 161-193
- [7] Sigala M and Chalkiti K 2015 Knowledge management, social media and employee creativity. *International Journal of Hospitality Management*, **45** 44-58
- [8] Graesser A C 2015 Deeper learning with advances in discourse science and technology. *Policy Insights from the Behavioral and Brain Sciences*, **2** 1 42-50
- [9] Nasution M Y and Rezeqi S 2015 Application of contextual learning to improve critical thinking ability of students in biology teaching and learning strategies class. *International Journal of Learning, Teaching and Educational Research*, **11** 3 109-116
- [10] Alt D 2015 Assessing the contribution of a constructivist learning environment to academic self-efficacy in higher education. *Learning Environments Research*, **18** 1 47-67
- [11] Yuliana T E, Wahyuni S and Bachtiar R W 2017 Module Development Based on Picture Stories to Improve Interest in Learning Material Environmental Pollution. *Pancaran Pendidikan*, **6** 3 189-198
- [12] Hamari J, Shernoff D J, Rowe E, Coller B, Asbell-Clarke J and Edwards T 2016 Challenging games help students learn: An empirical study on engagement, flow and immersion in game-based learning. *Computers in Human Behavior*, **54** 170-179
- [13] Hwang G J, Chiu L Y and Chen C H 2015 A contextual game-based learning approach to improving students' inquiry-based learning performance in social studies courses. *Computers & Education*, **81** 13-25



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