

The Development of Interactive Learning Media Based on Problem Based Learning (PBL) Using Macromedia Flash 8

Mhd Fauzi Amri^{1*}, Abdul Hasan Saragih², Erma Yulia³

¹Magister of Technology Education of Universitas Negeri Medan, Medan, Indonesia

²Department of Technology Education of Universitas Negeri Medan, Medan, Indonesia

³Department of Technology Education of Universitas Negeri Medan, Medan, Indonesia

*Corresponding author. Email: fauziamri9223@gmail.com

ABSTRACT

The study aims to produce an interactive learning media based problem based learning (pbl) use macromedia flash 8 of basic technology automotive subject that worthy, effective use, easy to learn and easy to use. The type of research is a development research that use Borg and Gall product development models. The learning product development model is a model that is arranged systematically and meets the characteristics. The process making this product the following stages : preliminary study, planning and development, validation, media test. The result of hypothesis testing indicates that there is difference the students outcomes learn by using interactive learning media with the students who are taught without using interactive learning media. This concluded from results of data processing where $F_{hitung} < F_{tabel}$ that is $1,348 < 1,738$ at a significant level $\alpha = 0,05$. The final conclusion is the students who are taught using interactive learning media have an average learning outcome of 79,76 while students who are taught without using interactive learning media have learning outcomes of 72,33.

Keywords: *Interactive Learning Media, Problem Based Learning, Macromedia Flash 8, Students Learning Outcomes, Basic Technology Automotive*

1. INTRODUCTION

Education is a series of activities that function to change a person in the educational process that has an impact on himself. Good and quality education will produce quality human resources. According to Darwin (2010: 46) education is a conscious and planned effort to create an atmosphere of learning and the learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and skills needed by them. society, nation and state.

Vocational High School (SMK) is an education provider that has a vision and mission to prepare students to enter the world of work after graduating from school. This situation requires teachers to always be responsive to developments in technology and information. So that graduates from SMK can compete with advances in technology and information.

According to Rosihan and Arsana (2018), Vocational High School (SMK) aims to prepare students to master skills to enter the workforce and provide students with provisions to continue with higher vocational education. According to the spectrum of light vehicle Vocational High Schools, it can be classified into 3, including normative subjects, adaptive subjects, and productive subjects.

Basic Automotive Technology is one of the fields of study taught at SMK in the Light Vehicle Engineering Department in class X at SMK Negeri 5 Medan. This subject provides material on occupational safety and health, light fire extinguishers (APAR), energy conversion engines, engine classification, 2 and 4 stroke engine work, and metal forming.

A good learning process will affect student learning outcomes during the learning process. Therefore, teachers are required to be able to create a conducive and attractive learning atmosphere so that learning does not feel bored. In the learning process the teacher must

also be precise in choosing the learning model and media used in the learning process so that student learning outcomes increase.

Learning media is one of the factors that influence learning programs and plays a very important role in improving student learning outcomes. Sadiman (2009: 7) media is anything that can be used to transmit messages from sender to recipient so that it can stimulate students' thoughts, feelings, interests and attention in such a way that the learning process occurs. Then according to Rayandra (2011: 8) that learning media can be understood as anything that can convey or transmit messages from a source in a planned manner, resulting in a conducive learning environment where the recipient can carry out the learning process efficiently and effectively.

Based on observations and interviews conducted by the author at SMK Negeri 5 Medan with the subject teacher of Automotive Basic Technology from the results of the semester test for class X Automotive Light Vehicle Engineering at SMK Negeri 5 Medan, it is not satisfactory, which is indicated by the large number of students who get sufficient grades or equivalent to the completeness criteria. Minimum (KKM). This can be seen in Table 1 below.

Table 1. Document recapitulation

No	Value Range	Frekuensi	Persentase (%)
1	80-85	4	12,5
2	75-79	3	9,4
3	70-74	2	6,2
4	65-69	4	12,5
5	60-64	6	18,7
6	55-59	7	21,9
7	50-54	6	18,8
	Total	32	100%

One way to foster student activeness and motivation in learning is by choosing learning models and learning media that are attractive to students so that learning can be carried out as expected. According to Hidayat and Palupi (2013), one of the efforts to improve the quality of learning is by choosing a strategy or way of delivering learning material in order to obtain an increase in student learning competence.

The learning model that can be used by teachers to foster student activeness and motivation is the Problem Based Learning (PBL) learning model. According to Sudarman (2007) Problem Based Learning is a learning model that uses real-world problems as a context for students to learn about critical thinking and problem-solving skills, as well as to acquire essential knowledge and concepts from subject matter.

Learning media that supports the creation of interactive learning media, namely Macromedia Flash. Macromedia Flash program is an animation program that has been widely used by animators to produce professional animations. Therefore, Macromedia Flash can be used as an interesting and interactive learning medium because it contains text, images, sound, and animation.

Through the use of media, learning motivation will increase followed by an increase in learning achievement. As the results of Bahri's (2016) research on the subject of conventional motorbike gasoline fuel systems, it is concluded that the development of Macromedia Flash learning media can be used as a method to increase learning activeness and student learning motivation. In addition, Macromedia Flash learning media can also improve students' understanding of the material because there is a significant difference in the percentage of student learning outcomes in the control class using lecture and powerpoint methods, namely 39%, while in the experimental class using the development of Macromedia Flash learning media, which is equal to 72.73%.

The problem that occurs at SMK Negeri 5 Medan lies in the unavailability of attractive media that is able to make students understand the material presented by the teacher. Many things can be used as learning media, especially for learning Basic Automotive Technology. One of them is using interactive learning media containing Basic Automotive Technology material that is presented as attractive as possible.

In order to improve the quality of learning and student performance, it is necessary to develop interactive learning media that can help teachers and students in learning activities. Based on the activity problems that have been observed, Macromedia Flash software can be used to solve learning problems in Basic Automotive Technology subjects at SMK Negeri 5 Medan.

2. METHOD

This research is a research development (Research and Development). Research and development is an industry-based development model where the findings of the research are used to design learning products, which are then tested in the field, evaluated, and refined until a learning product is produced that meets certain standards, namely effective, efficient and quality. Based on the research model previously described, the development of interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 in this development research is grouped into four groups, namely: (1) preliminary studies, (2) media design and development, (3) validation and (4) Test the media.

Product development of interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 requires repetitions in the framework of formative evaluation, these repetitions are obtained from research subjects consisting of instructional design experts, material experts, software experts, and users products, namely students of class X Automotive Light Vehicle Engineering SMK Negeri 5 Medan.

After the resulting learning media products are validated by material experts, software experts, and instructional design experts, then they are tested on students of SMK Negeri 5 Medan which are divided into three stages of testing, namely: (1) individual trials conducted by 3 students at SMK Negeri 5 Medan in class XI which has a low, medium, and high level of understanding of the material being taught. (2) the small group trial was conducted by 9 students of SMK Negeri 5 Medan who had a low level of understanding of the material as many as 3 people, 3 people had a moderate level of understanding, and 3 people had a high level of understanding. Furthermore (3) field trials conducted by all class X students of SMK Negeri 5 Medan, totaling 34 people (one class).

3. RESULT AND DISCUSSION

At the preliminary study stage, a needs analysis was carried out, it can be concluded that the development of Problem Based Learning (PBL) based interactive learning media using Macromedia Flash 8 on the subject of Basic Automotive Technology is needed by teachers and students in the learning process.

After obtaining the needs analysis data, the next step is to design and develop interactive learning media using the Macromedia Flash application.

After that it is continued with the design and development steps which have several stages, namely the analysis stage, at this stage an analysis of the learning media is carried out. After analyzing the learning media, it is necessary to develop interactive learning media, then develop the media according to the analysis. At the analysis stage it was found that there was a need to develop interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 in the Basic Automotive Technology subject then proceed to the next stage, namely the design stage. In this study, which is designed is a media on the subject matter of Basic Automotive Technology on the subject of understanding how the engine 2 and 4 steps work using Macromedia Flash media applications. The next stage is the stage of developing interactive learning media using the Macromedia Flash application to

produce a media that has been analyzed and has been designed in such a way that it can be used. The next stage, namely the implementation stage, is to apply interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 which has been analyzed, designed and developed for students. The next stage, namely the evaluation stage is the process to see whether the learning system using Problem Based Learning (PBL) based interactive learning media using Macromedia Flash 8 is successful or not. This learning media is evaluated by material experts, software experts and instructional design experts. The expert stated that the interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 was feasible to use and furthermore, this learning media was also evaluated through individual trials, small group trials and field trials.

After that, it was continued with the validation and testing stages of learning media. According to the expert on the quality of interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 from the aspect of guidance and information worth 4.25 which is in the very feasible criteria range, the content / material aspect is worth 4.16 which is within the appropriate criteria range, and from the evaluation aspect, it is worth 4.25 which falls within the very feasible criteria range. The results of the expert assessment of the learning material developed were "very feasible" for use with an average score of 4.20. According to software experts, the quality of interactive learning media based on Problem Based Learning (PBL) uses Macromedia Flash 8 from the aspect of guidance and information worth 4 which is within the range of feasible criteria, the performance aspect of the program is worth 3.7 which is within the range of feasible criteria, and from the aspect of systematics, aesthetics and design principles, the score is 4.2 which falls within the appropriate criteria range. According to instructional design experts, the quality of interactive learning media based on Problem Based Learning (PBL) uses Macromedia Flash 8 from the aspect of eligibility for content worth 4 which is in the range of feasible criteria, the presentation aspect is worth 4.27 which is in the very feasible criteria range, and from the graphic aspect worth 4.20 which falls within the very feasible criteria range. The results of the instructional design expert's assessment developed were "very feasible" for use with an average score of 4.44. Based on the results of individual trials for the development of interactive learning based on Problem Based Learning (PBL) using Macromedia Flash 8 from

the aspects of guidance and information, multimedia materials, evaluation, media design and facilities and the effects of pedagogy on the acceptance segment (level of acceptance by users) were assessed as a whole. Each includes very high acceptance or the level of acceptance by students is classified as very high with an average score of 4.23. Based on small group trials developing interactive learning based on Problem Based Learning (PBL) using Macromedia Flash 8 from the aspects of guidance and information, multimedia materials, evaluation, design and media facilities and the effects of pedagogy on the acceptance segment (level of acceptance by users) were assessed as a whole. Each includes very high acceptance or the level of acceptance by students is classified as very high with an average score of 4.18. Based on field trials developing interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 in the field trial of 34 class X students of Automotive Light Vehicle Engineering, it was explained that the products developed could be accepted by students at a very high acceptance level and were feasible to use with an average score of 4.64.

4. CONCLUSION

Interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 which was developed is very suitable for use by class X students in the subject of Basic Automotive Technology. Interactive learning media based on Problem Based Learning (PBL) using Macromedia Flash 8 which was developed effectively to improve learning outcomes for Basic Automotive Technology.

ACKNOWLEDGMENTS

The author would like to acknowledgment Drs. Sukir, MT, from P4TK medan, Drs. Sriadhi, M.Pd, M.Kom, PhD and Prof. Dr. Harun Sitompul, M.Pd from Universitas Negeri Medan who has agreed to become expert validators.

REFERENCES

- [1] Darwin, "Dinamika Kependudukan dan Penguatan Governance," Yogyakarta: Media Wacana, 2010.
- [2] Rosihan, Mohammad Yusuf dan Arsana, I Made, "Penerapan Model Pembelajaran Cooperative Script (Cs) Untuk Meningkatkan Hasil Belajar Siswa pada Materi TDO Kelas X TKR2 di SMK Negeri 1 Kalianget," Jurnal Pendidikan Teknik Mesin, vol. 6, pp.59-64. 2019.
- [3] Sadiman, Arief S, "Media Pendidikan," Jakarta: Raja Grafindo Persada, 2010
- [4] Rayandra, Asyhar, "Kreatif Mengembangkan Media Pembelajaran," Jakarta: GP. Press, 2011.
- [5] Hidayat, Togik dan Palupi, "Penerapan Media Pembelajaran Berbasis Macromedia Flash 8 melalui Pembelajaran Langsung Untuk Meningkatkan Hasil Belajar Pada Pelajaran Mesin Cnc Tu 2a Siswa Kelas Xi Tpm 3 Di Smk Negeri 3 Boyolangu," Jurnal Jurusan Pendidikan Teknik Mesin, vol. 2, pp. 63-71, 2013.
- [6] Sudarman, "Problem Based Learning : Suatu Model Pembelajaran untuk Mengembangkan dan Meningkatkan Kemampuan Memecahkan Masalah," Jurnal Pendidikan Inovatif, vol 2, pp. 68-73, 2007.
- [7] Bahri, Afrizal, "Pengembangan Media Pembelajaran Macromedia Flash Pada Mata Pelajaran Sistem Bahan Bakar Bensin Konvensional untuk Meningkatkan Motivasi dan Keaktifan Siswa Kelas XI Teknik Sepeda Motor SMK Negeri 1 Sapuran Kabupaten Wonosobo," FKIP, Universitas Muhammadiyah Purworejo, 2016.
- [8] A. Manurung, A. Fildzah, J. Rajagukguk, "Computer Based Test (CBT) System for Student Academic Examination", Proceedings of The 5th Annual International Seminar on Trends in Science and Science Education, AISTSSE 2018.