ADDIE Model Application Promoting Interactive Multimedia

B Baharuddin*
Universitas Negeri Medan, Indonesia

*baharuddin.bah@gmail.com

Abstract. This paper presents the benefits of interactive learning in a vocational high school, which is developed by Research and Development (R&D) method. The questionnaires, documentations, and instrument tests are used to obtain data and it is analyzed by descriptive statistic. The results show the students’ competence is generated up to 80.00 %, and the subject matter aspects of the content is up to 90.00 %. The learning outcomes average is 85. This type media fulfills the proposed objective which can enhance the learning outcome.

1. Introduction
Nowadays Indonesia needed increasing the high quality of the performance of the graduates of the vocational high school by improving the learning quality with providing a new learning paradigm [1]. Some problems faced in this case including the limitation media.

All this time the print media is still often used in learning, because of the quite easy and widely known in the world of education, as well as easy to develop and to find the various sources. It becomes the weakness because of the highly dependent on the verbal symbol.

The development of instructional media is very important to overcome these limitations which is can be designed by educators themselves according to the defined goals. It is expected to create an atmosphere of learning and the learning experience more meaningful, and to enrich the student learning experience. Thus the passive and boring of the learning atmosphere can turn into active participation and then the students to be more interactive. The success of the learning in the vocational education determine the successful of them in the work. Therefore it is important to build the media which can be to fulfill its which can be used to deliver messages from the sender to the receiver to stimulate their thoughts, feelings, interests and students' attention such as the learning process occurs [2], and make the learning process efficient and effective manner. So the learning material is accepted by students more quickly with an intact and attract students to learn more. It is as a tool for physical and non-physical form that is deliberately used as an intermediary between teachers and students in understanding the learning materials to more effectively and efficiently [3].

The Instructional design as a system and consider learning is systematically process. This systematic way of working always refer to the general stages of learning development system. The stages are analysis, design, development, implementation, and evaluation [4]. By designing the creative learning, it becomes innovative, interested, more iterative, more effective, and the quality learning which enhance the student learning [5]. The teaching and learning can be done anywhere and anytime, and the student’s attitude and interest in learning can be enhanced [6].

The interactive multimedia is a multimedia equipped with a controller that can be operated by the user, so that it can be chosen what they wants to proceed. Its benefits are (1) the introduction of
information and communication technology to students, (2) giving out new experiences and fun both
teachers themselves and the students, (3) Pursue pace with the knowledge of science and technology in
the field of education, (4) the use of multimedia can raise the learners’ learning motivation, (5)
Multimedia can be used to help learners to form mental models that will make it easier to understand a
concept, (6) Following the development of science and technology [7]. It intended to assist educators
in the delivery of material and help students involved in the learning process to understand the
material being taught [8].

By designing the creative learning, the process is expected to be innovative, interested, more
iterative, more effective, quality learning, and which can enhanced student learning, teaching and
learning. And also it can be done anywhere and anytime. Furthermore the students’ attitude and
interest in learning can enhanced student learning [9]. The effectiveness of this media is based on (1)
ease of navigation (2) the content of cognition, (3) the presentation of information, (4) the integration
of media, (5) aesthetics (6) functions as a whole [10], and the changes in behavior are: (1) knowledge;
(2) understanding; (3) habits ; (4) skills; (5) appreciation; (6) emotional; (7) social relations; (8)
 physical; (9) the ethical or moral character; (10) attitude. These were obtained through a learning
process includes the overall change of the behavior on the understanding learning [7] [11].
Furthermore the interactive multimedia learning is develop in order to achieve an effective and
efficient of learning in electrical installation on vocational school.

2. Methods
The stages of the development process done are (1) Gathering data from the field related to students
needs by observation accompanied by the school had computer and internet, and also student and
teacher have been familiar to use it; (2) Designing and manufactur ing the media, where the results of
the evaluation in each of phase of the development of learning can bring to the earlier phase. The final
results from a phase become an initial product for the next phase. It is a bridge between learners,
materials, and all forms of media based technology, which is based on the five learning process.
Analyzing the process is to define what will be learned by the participants learn. It is done by needs
assessment, identify problems, and perform analysis tasks. Therefore, the output will we generate is i
n the form of a characteristic or profile of potential participants learn, identify gaps, needs identification
and analysis of the detailed tasks based on the need. In the design stage also is built blueprints which is
said the formulating learning goals, namely specific, measurable, applicable, and realistic.
Furthermore devise a test, where the test is based on the learning objectives that have been formulated
earlier; (3) Implementing the model such as a concrete step in learning system. In this stage, all of
them have been developed and installed or set in such a way appropriate to the role or function that
could be implemented; (4) Evaluating is done to see if the system built a successful learning, in line
with initial expectations or not. Actually, the evaluation phase can occur at any stage in the top four.
Evaluation happens at each of four stages above it is called formative evaluation, because the goal of
the revised requirements.

The questionnaires is used to find out data related to the useful and quality of the media, and the
students’ learning outcomes assessed by the tests. In these case is initiated the criteria in Table 1.

| No | Interval          | Criteria                  |
|----|-------------------|---------------------------|
| 1  | 81 % ≤ score ≥ 100 % | Very Good or Strongly Agree |
| 2  | 61 % ≤ score ≥ 80 %  | Good or Disagree           |
| 3  | 41 % ≤ score ≥ 60 %  | Enough                    |
| 4  | 21 % ≤ score ≥ 40 %  | Less good or less Agree    |
| 5  | 0 % ≤ score ≥ 20 %   | No Good or Disagree        |
3. Results and Discussion
Based on the need assessment is found (a) the delivery of learning materials using the lecture makes the students less active so that students experiencing rapid saturation; (b) students expressed the need for the use of interactive media which is able to facilitate their students learning process in electrical lighting installation of the simple building, and also the media which can be used on the practice of a virtual so that they can understand theoretically and then reinforced by the practice of the material submitted, (c) students need to know the lighting electrical installation material of the simple buildings because these materials is the basic materials of the next instructional material.

Based on these the media is developed and packaged in the form of an interactive CD by the specifications of (a) the display of interest, (b) easy to use, (c) to be used in computer, (d) equipped with supporting software, (e) material according to the need to learn, and easy to understand. This media is made in simulations, animations, audio, video, and images.

It is considered to (a) the user; to facilitate the learning process and increase the interest and learning outcomes Vocational middle school students; (b) equipment output as an interactive CD which can be used independently by the students.; (c) figure, it is accompanied by a picture as the background and illustrations; (d) audio; to refresh students; (e) animation; students can see the illustrations move from material learned; (f) simulation and video; students can press the play button to run the video; (g) answers form; the answers provided in menu form of exercise in the learning media.

In the design and development of this CD interactive the following factors of major concern, namely: (1) the presentation of information, (2) the use of media, (3) ease of use, (4) expediency. The material contained in the media is still limited to a few sub competencies that remain intertwined, so although only consists of several sub competencies media still has a value of the knowledge needed to achieve the learning objectives in accordance with the curriculum. Limitations of this material due to time constraints in the study.

The material consists of (1) Instructions for use, (2) General purpose, (3) the material, (4) Simulation, (5) Application, (6) test. Once the design and content of the CD interactive has been completed, the next action is a concrete manifestation. In its’ operations, the execution starts from choosing the background and putting the buttons in accordance with a predetermined design. This product is validated by media expert and subject matter experts.

The validation results of media experts and matter experts is noted respectively 80% (good), 95.58 (very good). It presents the development of these media have succeeded in achieving the ultimate goal of the research is to see whether the media response experts that can be developed or fit for using as a medium of learning.

Disseminating the media is done in two phase, namely (1) phase 1 involved 10 students of class XI Mechanical Power Installation in obtaining the information about the students’ responses using the media in the learning process. Each student used the media and then give the comment to the used of media, by answering the provided questionnaire and take the test. Based on the analysis results of these is conducted the revision of the media. (2) phase 2 involve 29 students. In this stage is found the average of the students’ comment is 85. It is made in revising the media. Based on the research done, and the results of a questionnaire distributed to media specialists and subject matter experts, the multimedia ratings experts expressed the assessment of aspects is a good guide, the following discussion are listed in the Table 2.

| No. | Statement                                | Expert | Average | Category     |
|-----|-----------------------------------------|--------|---------|--------------|
| 1   | Instructions for use application program | I 4    | 5 5     | 90%          | Very Good    |
| 2   | Ease of use program                     | I 4    | 5 5     | 90%          | Very Good    |
| 3   | Structure and practicality of application program | I 4    | 4 4     | 81%          | Good         |

Table 2. Validation Results of expert Aspects
Aspects of assessment in the aspect of the guide is a manual application usage by the average value of 90.00 % with a very good category. The second point is the ease of use assessment program with an average value of 90.00 % with a very good category. The third point is the structure and practicability assessment application program with an average 81.00 % in both categories. Overall the average assessment of aspects of guidance is 88 % or in the excellent category. Expert assessment of the media states that media content is excellent as the Table 3.

Table 3. Results of Validation Experts on Aspects of Content

| No. | Statement                                           | Expert | Average | Category |
|-----|----------------------------------------------------|--------|---------|----------|
| 1   | Clarity of learning objectives statement           | 5 5 4  | 90.00%  | Very Good|
| 2   | The suitability of the content / materials with the aim | 4 5 4  | 87.00%  | Very Good|
| 3   | The suitability of the content / materials with the curriculum used | 4 4 4  | 80.00%  | Good     |
| 4   | Instructions and application guides the use of the content / materials | 4 5 5  | 90.00%  | Very Good|
| 5   | Exposure limits on the concept and content of materials | 4 5 5  | 90.00%  | Very Good|
| 6   | Giving examples and illustrations                  | 3 5 5  | 87.00%  | Very Good|
| 7   | Recency of the content / material presented        | 4 4 4  | 80.00%  | Good     |
| 8   | Ease understand the language used                  | 4 4 5  | 87.00%  | Very Good|

In the aspect of the media content multiple ratings include clarity of statement of purpose with average value of 90.00 % in the excellent category , the suitability of the content with the aim to value 87.00 % in both categories , the suitability of the content with the curriculum used with 80 % in either category , user and application guidelines use the content with a value of 90.00 % in the excellent category , and exposure to concepts and restrictions on the content of the material , giving examples and illustrations as well as the recency of the content 87.00 % in the excellent category , as well as the ease of understanding the language used by the value of 87.00 % in the excellent category . Overall the average ratings aspects of content media was 88.00 % in the excellent category.

Assessment of the aspects of the exposure in the media is very good, as shown in Table 4.

Table 4. Validation Results expert on Aspects of Exposure

| No. | Statement                                           | Expert | Average | Category |
|-----|----------------------------------------------------|--------|---------|----------|
| 1   | Quality exposure to content / material presented   | 4 5 4  | 87.00%  | Very Good|
| 2   | Mechanical and systematic presentation of the content / materials | 3 4 5  | 80.00%  | Good     |
| 3   | The use of colours on screen display (screen )     | 4 4 5  | 87.00%  | Very Good|
| 4   | The composition of the text used                   | 4 5 4  | 87.00%  | Very Good|
| 5   | The composition of graphics and images presented   | 3 5 4  | 80.00%  | Good     |
| 6   | Quality video/audio                                | 4 4 5  | 87.00%  | Very Good|
| 7   | Ease of understanding the information presented     | 4 5 4  | 87.00%  | Very Good|
| 8   | The use of directional keypad / controller         | 4 4 5  | 87.00%  | Very Good|

Assessment aspects of exposure at each point is the quality of the exposure of the content/materials are presented as well as techniques and systematic presentation of the content with a value of 87.00% ;80% in both categories, the use of color on screen display (screen) and, composition of the text that is used with a value of 87.00 % in the excellent category, the arrangement of graphics and images are presented with 80 % in both categories, the quality of video/audio, the ease of understanding the
information presented, use directional button/controller with a value of 87.00% in the excellent category. Overall the average assessment of aspects of exposure was 85% in the excellent category.

Based on the research that has been done, the effective learning media such as a medium of learning in subjects of lighting electrical installations on the simplified building is relatively easy and simple, just insert the CD via DVD or CD drive on the laptop or computer and displays via the projector screen or also via computer, following the practice directly as presented in the learning media. It is in line to the states of Ryan and Bagley (2015). It is also showed by the language which important to avoid the constraints in terms of language. In this case Indonesian language is used to guide using the media.

4. Conclusions
The investigation presents the interactive learning media developed is feasible and effective as a medium of learning, especially in the and also can improve the skills of teachers in making learning more interesting for students. So students more interested in learning, because they learn in a way that is more interesting.

References
[1] Rayandra and Asyhar 2011 Kreatif Mengembangkan Media Pembelajaran (Jakarta: GP Press)
[2] Deng, Liping 2015 Exploring university students’ use of technologies beyond the formal learning context: A tale of two online platforms Australasian Journal of Educational Technology, 31(3)
[3] Banas, Jennifer R 2014 Authentic learning exercises as a means to influence preservice teachers’ technology integration self-efficacy and intentions to integrate technology Australasian Journal of Educational Technology, 30(6)
[4] Dick W, Carey L J O, and Carey 2005 The Systematic design of instruction Boston (New York: Walter Dick and Lou Carey)
[5] Liaw et al 2007 Surveying instructor and learner attitudes toward elearning, Computer and Education, 49(4)
[6] Thoutenhoofd et al 2015 From self-regulation to learning to learn: observations on the construction of self and learning, British Educational Research Journal, 41(1), 72-84
[7] Niken Ariani dan Haryanto 2010 Pembelajaran Multimedia di Sekolah (Jakarta: Prestasi Pustaka)
[8] Broekman, Pauline van Mourik, et al 2014 Reviews British Journal of Educational Technology, 46(1)
[9] Tsai et al 2001 Developing an Internet Attitude Scale for high school students Computer and Education, 37(1), 41-51
[10] Wery, J, and Thomson, M M 2013 Motivational strategies to enhance effective learning in teaching struggling students Support for Learning, 28(3), 103-108
[11] Benny A Priyadi 2009 Model-Model Desain Sistem Pembeleajaran (Jakarta: PPS-UNJ)