

Developing Interactive Multimedia on Reading Skill Learning for Grade X Students of Vocational High School

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Abstract—The study aimed to describe the developing interactive multimedia and describe the students' responses to interactive multimedia development involving media experts and practitioners (teachers). This research was a research and development. This research process was conducted in several stages: introduction, planning, development and production. The product of interactive multimedia on reading learning were explaining the pictures, charts, graphs, diagrams or matrices in the form of software stored on CD (Compact Disc). The scoring results of media assessments were (1) 77 provided by media expert with good criteria, (2) 98 provided by practitioner (teacher) with very good criteria, and (3) 95.5 provided by field test with very good criteria. Students' responses to interactive multimedia were very interesting and easy in understanding the material.

Keywords—*development, interactive multimedia, reading learning*

I. INTRODUCTION

In era of rapid technological development, teacher-centered learning and using books and traditional learning instrument are no longer relevant. Teachers are demanded to develop learning media with creative and innovative in order create a fun learning process for students. According to Arsyad [1] there are two very important elements in teaching and learning process; learning methods and learning media. Learning media are all tools and materials facilities to achieve the educational goals such as radio, television, books, magazines, computers, etc. [1]. Learning media is a component of transfer information from learning resources and tools both physical and non-physical tool containing instructional material, which it might be used to convey messages or information.

The purposes of using learning media are; (a) improve the effectiveness of communication process in learning; (b) solve the problems on communication process; (c) clarify the message in order the learning is not verbally; and d) give the same learning stimulus, and equal and create the same perception. At the beginning, media with combination more than one medium including sound, music, photos, slides, films and videos are interpreted as multimedia [2]. Multimedia is a variety combination of graphics, text, sound, video and animation. This combination is a unity (integrated) to present information, messages, or content of

learning that require hardware and computers as controller of the tools [3]. Multimedia is presentation of material using either word or pictures (verbal form) [4]. Daryanto [5] states, multimedia is divided into two categories; linear multimedia and interactive multimedia. Linear multimedia is multimedia with not equipped by any controller. Meanwhile, interactive multimedia is a multimedia with equipped by a controller to be operated by user, and then the users can choose their willing for the next process.

Multimedia has functions and benefits for various field sectors including education. Daryanto [5] states that when learning multimedia is chosen, developed and used appropriately and well, it will provide enormous benefits for teachers and students. The benefits are providing more interesting and interactive learning, reducing the amount of teaching time, improving the quality of student learning, teaching and learning process can be conducted in anywhere and anytime, and improving the student learning attitudes. The benefits might be obtained because several advantages of multimedia learning, they are; (1) enlarging very small and invisible objects; (2) minimizing very large objects that are not possible to bring into school; (3) presenting objects or complex, complicated and sooner or later of an event; (4) presenting distant objects or events, (5) presenting dangerous objects or events; and (6) increasing the attractiveness and attention of students. Moreover, learning multimedia should meet the following functions; (1) able to strengthen the users' response as soon as possible and as often as possible; and (2) able to provide opportunities for students to manage the learning [5].

Learning on reading skill is one of the learning in Bahasa Indonesia subject to be applied with interactive multimedia. According to Ruddel [6], reading is an activity to build meaning on the text. Reading is an understanding. This relates to readers' interpretation in interacting with language on written form [7]. Olson and Dishner [8] states that rapid progress in learning reading depends on the ability of students to read independently and intelligently. According to Nurgiyantoro [9], reading activity is a mental activity to understand the spoken of other through writing. Basically, letters and / or writing are only symbols of certain language sounds. Therefore, reading activities must recognize the certain writing symbols represent (symbolize, suggest) certain sounds which contain certain meanings.

Recently, the use of computer laboratory is limited to information and technology subjects. In addition, teachers have difficulty in developing interactive multimedia in material of Bahasa Indonesian. As the impact, the use of computer laboratory is not optimal, especially for learning reading. The use of computer-based interactive multimedia in learning on reading skills is expected to solve the problems and develop new media in education sector, especially in Bahasa Indonesia subjects that have not received attention in the field of learning media development.

This interactive learning multimedia product was developed using the application program *Macromedia flas*, *Adobe Photoshop CS3*, *sound forge*, and several *software* other supporting. The product specifications to be produced are computer-based interactive learning multimedia programs for class X Indonesian subjects in reading skills. The product of learning media consists of the principles of message design which includes the principle of motivation that relates between tasks and results, the development of memory and the principle of activities which the activities of students in the learning process are and giving practice questions. In general, the contents of this multimedia program are as follows.

Main page section of the main page will be presented with five main menus, namely a menu of instructions, competencies, materials, evaluations and profiles. Each menu is operated by clicking on the button provided. *First*, instruction menu provides information about how to use and also the key information used in this media. *Second*, competency menu describes four topics, namely competency standards, basic competencies, indicators of achievement, and characteristics of media use. The display of this menu aims to explain the competency standards of the material presented. *Third*, materials, the essence of this media is printed on the material menu, in this menu there is a sub menu that explains the technique of expressing images, charts, graphs, diagrams or matrices verbally. *Fourth*, evaluation menu provides practice questions related to the material to develop memory and activity principles which are student activities in the learning process. *Fifth*, profile menu will be filled with identity data from the developer which aims to provide profile data information from the media developer.

The product produced from this development research is *software* multimedia learning for Indonesian subjects. The characteristics of *software* this include the following. *First*, this multimedia covers a variety of media components, namely text, images, animation, sound, and video, making it easier for students to learn material. The video display is intended to provide visualization of real events related to the material being studied so that learning is contextual and meaningful. *Second*, multimedia is interactive and can be used for individual or group learning, so students can be actively involved during the learning process, both in learning independently and in groups. *Third*, this multimedia for learning Indonesian language was developed to prioritize the involvement of students actively in learning. Therefore, this multimedia involves and activates students more during the process of learning methods. In software

this also students are trained to develop their independence in the learning process actively in accordance with their abilities. Thus, students/users are expected to experience the knowledge assimilation/accommodation process well. So, students are not only passively getting information/knowledge. *Fourth*, Multimedia for Indonesian language learning contains material about reading skills which are presented based on SK/KD and syllabus. *Fifth*, This interactive multimedia is stored in CD pieces. The CD disc is only used with computer devices that have a CD-ROM drive.

Therefore, this study develops interactive multimedia on reading skill learning for grade X students of vocational high school.

The rest of this paper is organized as follow: Section II describes the proposed research method. Section III presents the obtained results and following by discussion. Finally Section IV concludes this work.

II. PROPOSED METHODS

This study adopted Dich & Carey model of research and development method consisting of nine steps; (1) conduct a needs analysis to determine the objectives of the program or product being developed. This need analysis activity researchers identify priority needs that immediately need to be met. By examining the needs, the developer will know that there is a condition that should be (*what should be*) and the real situation in the field (*what is*); (2) conduct learning analysis that includes process skills, procedures, and learning tasks to achieve learning goals.; (3) analyze the learning context which includes the abilities, attitudes, and initial characteristics of students in the learning setting and also includes the characteristics of the learning background where new knowledge and skills will be used. Steps (2) and (3) can be done either sequentially or simultaneously (simultaneous); (4) outline general goals to be more specific targets Describe general objectives into more specific goals in the form of work objectives, or operational formula. The description of this operational formula reflects the specific objectives of the program or product, the procedure developed. This objective specifically provides information for the development of test items. The developer translates general objectives or existing competency standards into more operational objectives with certain indicators; (5) developing assessment instruments Developing instruments *assessment*, which are directly related to specific, operational objectives. The task of developing this instrument is very important. Instruments in this case can be directly related to operational objectives to be achieved based on certain indicators and also instruments to measure the device products or designs developed; (6) develop learning strategies to help students achieve specific goals. Certain learning strategies specifically designed to achieve goals are stated explicitly by the developer. The learning strategy designed is also related to the product or design that you want to develop; (7) developing and selecting learning materials in this case can be: printed materials, manuals for both learners and learners, and other media designed to support the achievement of goals; (8) design and conduct formative evaluation conducted oleh developers during the

process, procedures, programs or products developed. This formative evaluation is carried out when the learning process takes place with the intention of supporting the process of increasing effectiveness; and (9) make revisions made to the process (learning), procedures, programs, or products associated with the previous steps. Revisions are made to the first seven steps, namely: general learning objectives, learning analysis, initial behavior, goals for work or performance, test items, learning strategies, and learning materials until the final product [10]. This instrument research is a questionnaire. Sukmadinata [11] states that the questionnaire is an indirect method of collecting data that contains a number of questions or statements and must be answered by the respondent. The quality of the research instruments used greatly influences the data obtained, a good questionnaire instrument needs to consider several requirements including: (1) physical appearance of the questionnaire, (2) content / material extracted from the respondent, (3) discussion / sentence formulation used, (4) number of questions / statements, Validation is assessed by two experts; practitioners (teachers) and media experts [12].The subjects were 32 students of grade X at SMK Negeri (Public vocational high school) 4 Yogyakarta. The study used quantitative and qualitative data analysis. Quantitative data obtained from valuator and users

(students) as research subjects. And it continued to convert the quantitative data into qualitative, with the assessment criteria as follows (see Table I).

TABLE I. FORMULATION OF SCORE CONVERSION

Interval	Quality	Feasibility
81-100	Very Good	Feasible
61-80	Good	
41-60	Medium	
21-40	Poor	Infeasible

III. RESULTS AND DISCUSSION

The interactive multimedia consists of five main menus on the main page, namely; menu of instructions, competencies, materials, evaluations, and profiles. Each menu is operated by clicking the button. The essence of this media is a menu of material that has sub menus that explain techniques for expressing images, charts, graphs, diagrams or matrices verbally. The initial design consisting of several parts on the product will be described as follows.

(1) Front View, there is a front view of interactive multimedia about the technique of expressing images, charts, graphics, diagrams or verbally this matrix is a welcome page before entering the main menu. Shown in Figure 1 below:



Fig. 1. Front View

(2) Entering the program, entering an interactive multimedia application on the technique of expressing images, charts, graphs, diagrams or matrices verbally the user will go to the instructions page that presents program usage instructions as in Figure 2;



Fig. 2. Entering the program

(3) Main Menu, the main interactive multimedia technique is expressing images, charts, graphs, diagrams or matrices verbally containing program titles and main menu choices containing profiles, competencies, materials, and evaluations. Users can choose the menu to choose according to their needs, as shown in Figure 3.



Fig. 3. Main Menu

(4) Competence, this enrollment consists of 3 main parts, namely competency standards, basic competencies, and interactive multimedia achievement indicators about techniques of expressing images, charts, graphs, verbally diagrams or matrices (see in Figure 4).

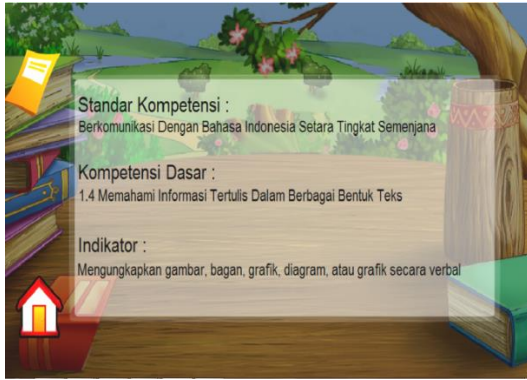


Fig. 4. Competence

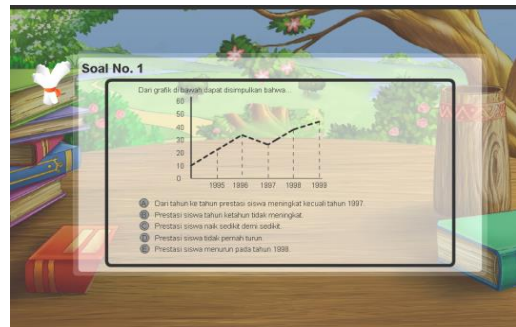


Fig. 7. Display of Exercise

(5) Material, there is a main menu of material containing sub the menu section where in this sub-section contains the material discussed more deeply. Sub menus contained in this material menu include graphics, tables, charts, floor plans, schedules; (see in Figures 5 and 6)

(7) Evaluation Menu is in the form of evaluating the list of questions submitted to users (students) related to the evaluation of the media that has been presented. Evaluation of clues to work instructions and 5 different filling questions (see in Figures 8 and 9).



Fig. 5. Material Choices

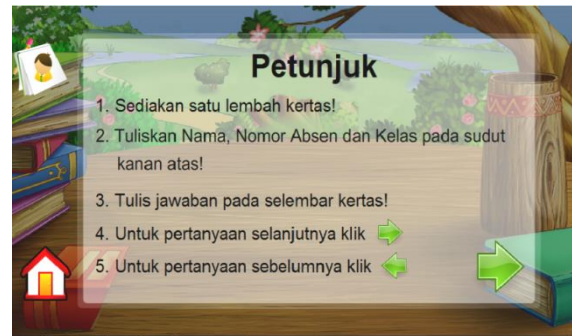


Fig. 8. Instructions for the Evaluation Program



Fig. 6. Example of Material Presentation

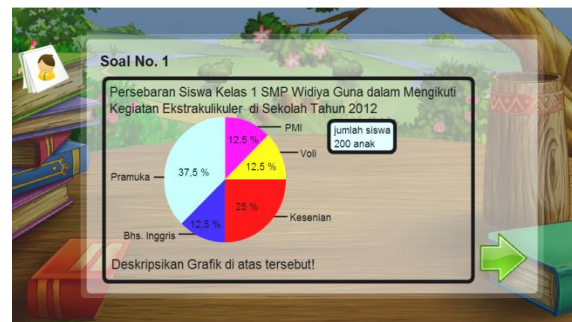
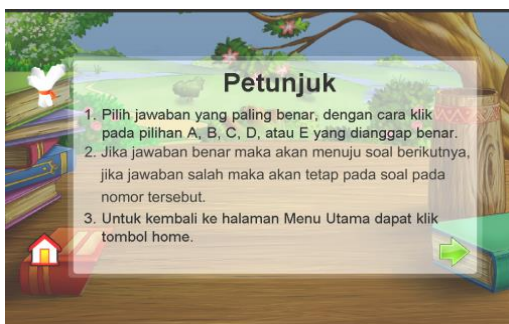


Fig. 9. Display of Evaluation Question

(6) Practice Questions, this includes a list of questions in the form of multiple items. This menu aims to reflect on the material that has been presented (see in Figure 7).

A. Results



1. Results of Media Expert Test and Revision of Interactive Multimedia

Data the results of expert material test showed that interactive multimedia has feasible category with average score of 3.0. The overall suggestions or comments on interactive multimedia from media experts are the background need to be adjusted with students on vocational high school. Based on these suggestions and comments, there revise the background (see in Table II).

TABLE II. RESULTS OF MEDIA EXPERT TEST

Components	Average Score	Quality	Feasibility
Display design	75	Good	Feasible
Quality of text	75	Good	Feasible
Quality of graphics	75	Good	Feasible
Quality of video	75	Good	Feasible
Quality of audio	82,5	Very Good	Feasible
Quality of navigation	75	Good	Feasible
Quality of program management	80	Very Good	Feasible
Media usefulness	75	Good	Feasible
Total of score	612,5	Good	Feasible
Average Score	76,5		

2. *Results of Practitioner (Teacher) Test and Revision of Interactive Multimedia*

Data the results of teacher (practitioner) test showed that interactive multimedia has very feasible category with average score of 3.9. The overall suggestions or comments on interactive multimedia from teacher (practitioner) are; the usefulness aspect should be included on core competence. Based on these suggestions and comments, there revise on page of core competence with adding the usefulness of interactive multimedia (see Table III).

TABLE III. RESULTS OF PRACTITIONER (TEACHER) TEST

Components	Average Score	Quality	Feasibility
The relevance of curriculum	100	Very Good	Feasible
Learning process	87,5	Very Good	Feasible
Material content	100	Very Good	Feasible
Language	100	Very Good	Feasible
Material conformity	100	Very Good	Feasible
Quality of exercise test	100	Very Good	Feasible
Media usefulness	100	Very Good	Feasible
Total of score	687,5	Very Good	Feasible
Average Score	98,2		

3. *Results of User (Students) Test and Revision of Interactive Multimedia*

Data the results of users (students) test showed that interactive multimedia has very feasible category with the average overall score through the user (student) test is 95.5. The overall suggestions or comments on interactive multimedia from users (students) are the developed interactive multimedia should not cover a

learning only (see Table IV).

TABLE IV. RESULTS OF USERS TEST

Components	Average Score	Quality	Feasibility
The attractiveness of display design	94	Very Good	Feasible
The conformity of selected background	94	Very Good	Feasible
Readability	100	Very Good	Feasible
The conformity of selected sound/music	96	Very Good	Feasible
The audio function to learning atmosphere	94	Very Good	Feasible
The attractiveness of graph display or animation	94	Very Good	Feasible
The animation function to material	92	Very Good	Feasible
The attractiveness of video	93	Very Good	Feasible
The video function to material	94	Very Good	Feasible
The attractiveness of navigator form	97	Very Good	Feasible
The consistency on navigator display	92	Very Good	Feasible
Ease on program navigating	100	Very Good	Feasible
Ease on choosing the program	96	Very Good	Feasible
Language explication	97	Very Good	Feasible
Language conformity to user	93	Very Good	Feasible
The attractiveness of material program to motivate the user	94	Very Good	Feasible
Facilitate the learning	100	Very Good	Feasible
Media usefulness	100	Very Good	Feasible
Total of score	1720	Very Good	Feasible
Average Score	95,5		

B. *Discussion*

The results of expert test on the assessment of material expert, practitioner (teacher), and user tests (students) showed that the developed interactive multimedia is classified as very good or feasible category. This conclusion based on the average score of 76.5 provided by media expert, and 98.2 provided by practitioner (teacher). And, the average overall score through the user (student) test is 95.5.

The test results provided by media experts showed that the developed interactive multimedia is feasible or good based on 8 aspects. They are; (1) display design; (2) text quality; (3) graphic quality; (4) video quality (5) audio quality; (6) navigation quality, (7) quality of program management, and (8) media usefulness. Those are valid and reliable. Means, the developed interactive multimedia is classified as feasible and can be used as learning media in the classroom.

The test results provided by practitioner (teacher) show that the developed interactive multimedia is very good or very feasible based on 7 aspects. They are; (1) the relevance to curriculum; (2) learning process; (3) material content; (4) language; (5) material conformability; (6) quality of exercise questions; (7) media usefulness. Those are valid and reliable and can be used as learning media in the classroom.

The test results provided by user showed that the developed interactive multimedia is very good or very feasible based on 18 aspects. They are; (1) The attractiveness of display design, (2) The conformity of selected background, (3) Readability, (4) The conformity of selected sound/music, (5) The audio function to learning atmosphere, (6) The attractiveness of graph display or animation, (7) The animation function to material, (8) The attractiveness of video, (9) The video function to material, (10) The attractiveness of navigator form, (11) The consistency on navigator display, (12) Ease on program navigating, (13) Ease on choosing the program, (14) Language explication, (15) Language conformity to user, (16) The attractiveness of material program to motivate the user, (17) Facilitate the learning , and (18) Media usefulness. Those are valid and reliable. Means, the developed interactive multimedia is classified as feasible and can be used as learning media in the classroom.

The material content of interactive multimedia is learning reading on express pictures, charts, graphs, diagrams or matrices verbally. The interactive multimedia consists of five main menus on the main page, namely; instructions menu, competence, material, evaluation, and author profile. The instructions menu provides information about how to use and information of key button. The competency menu provides information of four topics; competency standards, basic competencies, indicators of achievement and media usefulness. This menu display aims to explain the competency standards. The material menu provides sub menu that explains the technique to express pictures, graphics, charts, diagrams or matrices verbally. The evaluation menu provides questions relating the material aiming to develop memory and principle of activities which the students' activities in learning process are. The last, profile menu provides developer data that aims as profile information from media developers.

The product of this development is multimedia software including various media components, such as texts, images, animations, sounds, and videos, and is equipped with a controller in the form of menus aiming the user can operate it and make easier the students to learn and understanding the material. This is in line with Sadiman, [13] states that interactive multimedia is a multimedia that is equipped with a controller aiming the users can operated and choose the learning material for the next process. Video display in interactive multimedia is intended to provide visualization of real events relating to material on learning. As the impact, the learning is contextual and meaningful. This multimedia is interactive and can be used either for individual or group. And then, the students can be actively involved during the learning process, both in learning independently and in groups. In the interactive multimedia, more involves and invites students during the learning process. Students are trained to develop their independent learning to actively participate in learning process according to their abilities. Students can set up their learning speed. Thus, students will have experience the process of assimilation/accommodation of knowledge well and students not only passively obtain the information / knowledge.

IV. CONCLUSION

Based on the results of the study, it was concluded that interactive multimedia in the form of software stored on CD (Compact Disc) on techniques for expressing images, graphs, graphs, diagrams or matrices orally, had an average score of 76.5 provided by media experts with good criteria, and 98.2 is provided by practitioners (teachers) with very good criteria. And, the average overall score through user tests (students) is 95.5 with very good or very decent categories. In short, the developed interactive multimedia is classified as feasible and can be used as a learning media in the classroom. In general, responses student to multimedia interactive through small group testing and field testing are very interesting and useful for students in understanding the material and encouraging and motivating in the learning process. Teacher responses to interactive multimedia are developed, namely that the overall material presented is good, easy to understand and this interactive multimedia is very supportive for students in learning.

Based on the results of the study, this interactive multimedia can be used as a reference and a tool for Indonesian language teachers in relation to the teaching process. students should be able to use the CD as one of the Indonesian learning media independently. Further research is needed to determine the effectiveness of interactive Multimedia in Learning Reading Skill for Class X Vocational High School. The right type of research to test product effectiveness is experimental research.

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