

## **CHAPTER III**

### **RESEARCH METHOD**

#### **A. Type of the Study**

This study is categorized into educational research and development (R & D) as the goal of this study is to design an educational product which can be used effectively in the educational programs. Borg and Gall (2003: 569) define educational research and development as “an industry-based development model in which the findings of the research are used to design new products and procedures, which then are systematically field-tested, evaluated, and refined until they meet specified criteria of effectiveness, quality, or similar standards.”

#### **B. Setting**

The research was conducted from October September 24, 2010 up to December 10, 2010 at SMK Muhammadiyah 1 Wonosari. The school is located in Gunungkidul, DIY. There are eight classes in the elementary level. In this research, the researcher applied the three phases proposed by Allesi and Trolip (2001: 40, 409-412) i.e. planning, design, and development. At the first, the researcher conducted the planning phase that covers defining the scope, identifying learners’ characteristics, producing a style manual, determining and collecting resources, and obtaining client sign off. After accomplishing the first phase, the researcher conducted the second phase, i.e. designing phase. In this interactive multimedia development, designing phase covered developing initial content ideas, conducting task and concept analysis,

preparing script, and obtaining client sign-off. The last phase is development. In this phase, the researcher prepared the text, created the graphics, produced audio and video, prepared supporting materials, assembled the piece, did an alpha test, made revisions, did a beta test, made final revisions, obtained client sign-off, and validated the program.

### **C. Population and Sample**

#### **1. Population**

Tuckman (1988: 239) defines population as the group in which the researcher is interested in attaining information and drawing conclusions. In line with Tuckman, Borg and Gall (2003: 167) distinguish population as the larger group that the researcher wishes to learn while the smaller group that the researcher actually studies is called as the sample. Similarly, Creswell (2008: 151) explains a population as “a group of individuals who have the same characteristics”. Since this study developed the interactive learning multimedia of Effective Communication English Textbook that was intended for elementary level students, the population of this study was the elementary level students of SMK Muhammadiyah 1 Wonosari in the academic year of 2010/ 2011. There were 288 students in the elementary level which were divided into eight classes i.e. five classes of accounting study program, two classes of multimedia study program, and one class of culinary study program. Each class had approximately 36 students.

## **2. Sample**

In this study, the researcher applied purposive sampling technique. Arikunto (2006: 139-140) states that purposive sampling is intended to take the research subjects based on certain purpose, not based on the strata, area, or random. This technique used with some considerations such as limited time, human resource, facilities, and fund.

Since this research employed multimedia device and facilities, this research took the students of multimedia study program as the subject of the research. The reason is that they are more computer literate than the other study programs students, accounting and culinary. SMK Muhammadiyah 1 Wonosari has two classes of multimedia study program in which each class consists of 36 students. In this study, the researcher involved one class of multimedia study program as the sample of the research.

## **D. Research Procedure**

A model is required to develop this interactive multimedia systematically. In relation to this, the researcher developed the interactive learning multimedia adapting the model proposed by Allesi and Trollip. In their book (2001: 40, 409-412) is clearly stated that a good multimedia development should follow the three phases. Here are the three phases adapted from Allesi and Trollip model in details,

### **a. Planning**

- defining the scope

The area of the development was described.

- identifying learners characteristics

The learners' characteristics that became the participants of the try-out were investigated. These include the age, gender, language acquisition, and computer-literate.

- producing a style manual

A document of the steps was created to develop the interactive multimedia systematically.

- determining and collecting resources

The materials source that presented were found out, selected, or established.

- obtaining client sign off

An agreement about the plan was made with the board or school that used to try out the interactive multimedia.

#### b. Design

- developing initial content ideas

The mapping of the interactive multimedia was created including the order, the length, and the number of the materials.

- conducting task and concept analysis

The task and concept used in presenting the materials were investigated.

- preparing script

The script used in audio and visual elements was created.

- obtaining client sign-off

An agreement about the design was made with the board or school that will be used to try out the interactive multimedia.

c. Development

- preparing the text

The text was transferred into the interactive multimedia.

- creating the graphics

The graphics were made whether they were pictures or animations to support the material presentation.

- producing audio and video

The audio and video were made to facilitate the language skill materials particularly listening skill.

- preparing supporting materials

Some relevant supporting materials were provided such as games, crossword puzzles, search word puzzles, extra activities, quizzes, and songs.

- assembling the pieces

The text, graphics, audio, and video were rendered into one piece.

- doing an alpha test

The media were consulted to the media expert and also the material expert.

- making revisions

The media were revised based on the media and material experts' evaluation.

- doing a beta test

The media were consulted to the participants of the try out.

- making final revisions

The media were revised based on the participants' evaluation.

- obtaining client sign-off

An agreement about the development was made with the board or school that will be used to try out the interactive multimedia.

- validating the program

The final media were made in a complete appearance.

### **E. Data Collection Technique**

This research applied three kinds of techniques in collecting the data, i.e. observation, questionnaire, and interview. The researcher used observation technique to obtain the data about the learners' characteristics, learning sources, and the availability of multimedia facility. The questionnaires were administered following the guidelines proposed by Allesi and Trolip and Nesbit, Belfer, & Leacock in evaluating the media that are distinguished into three parts; 1<sup>st</sup> for the material expert, 2<sup>nd</sup> for the multimedia expert, and 3<sup>rd</sup> for the students. The first and second questionnaires used to obtain the evaluation toward the interactive multimedia development before being tried out to the students.

Then, the interactive learning multimedia was revised based on the result of the first and second questionnaires. It was aimed to evaluate the developed interactive learning multimedia, so it fulfilled the good quality criteria of material and multimedia point of views. The third questionnaire was administered to the students. It was aimed to evaluate the first revised interactive learning multimedia, so it could be more suitable for the students' conditions and the students' need. This questionnaire was followed by the interviews, so that the researcher got much feedback. The data and information obtained were used to revise the interactive learning multimedia and identify the effective design.

#### **F. Research Instruments**

The instruments used in this research were check-list, questionnaires, and interview guidelines. Allesi and Trolip (2001: 548-549) state that interactive multimedia can be evaluated using two kinds of test; alpha and beta testing. Alpha testing is the major test that is conducted by the design and development team. In this study, the researcher involved material expert and multimedia expert. The questionnaire used in this test was open-ended questionnaire in which the experts were free to give their judgement toward this research. Beta testing is the test done by the client (consumer) of the multimedia itself. In this research, the researcher involved the sample of this research who was the elementary level students of multimedia study program. Allesi and Trolip propose some aspects to evaluate that the researcher distinguishes into three parts, for the material expert, multimedia expert, and the students.

The questionnaires developed in this research also determine the principles proposed by Nesbit, Belfer, & Leacock in Leacock and Nesbit (2007:45). Here are the aspects to evaluate:

**Table 2: Nesbit, Belfer, & Leacock's Principals**

<b>Item</b>	<b>Brief Description</b>
Content quality	Veracity, accuracy, balanced presentation of ideas, and appropriate level of detail
Learning goal alignment	Alignment among learning goals, activities, assessments, and learner characteristics
Feedback and adaptation	Adaptive content or feedback driven by differential learner input or learner modelling
Motivation	Ability to motivate and interest an identified population of learners
Presentation design	Design of visual and auditory information for enhanced learning and efficient mental processing
Interaction usability	Ease of navigation, predictability of the user interface, and the quality of the interface help features
Accessibility	Design of controls and presentation formats to accommodate disabled and mobile learners
Reusability	Ability to use in varying learning contexts and with learners from different backgrounds
Standards compliance	Adherence to international standards and specifications



Here are the organizations of questionnaires developed for both alpha testing (material and media expert) and beta testing (the students) considering the aspects in Nesbit, Belfer, & Leacock in Leacock and Nesbit (2007:45) and Allesi and Trolip (2001: 548-549) whereas the criteria were adapted from Mayer in Mishra and Sharma (2005:14), Bates and Poole (2003: 61), Koumi (2006: 64), Lohr and Gall in Spector et.al (2008: 90), Marill in Koumi (2006: 106), and Ivers and Barron (2002: 71-72).

**Table 3: Organizations of Questionnaires**

No.	Criteria
1.	enabling learners to move from concrete and specific examples to more general abstractions
2.	the types of symbols the medium uses to communicate, e.g. text, moving pictures, and or sound
3.	how much influence can be exerted by students over the way they make use of the medium
4.	an action by a student receives feedback from the medium
5.	activating learners' prior knowledge as a foundation for new knowledge
6.	Using words and pictures rather than words alone
7.	Placing words and visuals close together
8.	Simultaneously presenting words and pictures
9.	Guidelines for Text <ul style="list-style-type: none"> <li>■ Left-justify the text (not centered).</li> <li>■ Keep sentences short and sweet.</li> <li>■ Use at least 12-point font size for hypermedia and Web pages.</li> <li>■ Do not place text on a background that has a pattern or graphic.</li> <li>■ Use generic fonts that are available on all computers</li> </ul>
10.	Guidelines for Color <ul style="list-style-type: none"> <li>■ Use fewer than seven colors per screen.</li> <li>■ Use consistent background colors.</li> <li>■ Use consistent text colors.</li> </ul>

11.	<p><b>Guidelines for Icons and Navigational Buttons</b></p> <ul style="list-style-type: none"> <li>■ Include options for users to back up and exit.</li> <li>■ Use common icons (such as arrows) for navigation.</li> <li>■ Provide instructions to help users navigate.</li> </ul>
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The interview technique that was done was focus group interview. Borg and Gall (2003: 238) say that focus group interview deals with groups of individuals who have been come together for specific purpose. The researcher asked a student from each low level ability, middle level ability, and high level ability as the representatives of this interview.

### **G. Data Analysis Techniques**

There were two types of data in this research. They were qualitative and quantitative data. The first type of data was taken from the interviews and observations. They were in the form of observation field notes and transcript of interviews. They were analysed verbally. The second type of data was collected from the questionnaires. The data from the questionnaires were intended to assess the material and multimedia experts' and students' opinion to the developed media.

A four-point scale used to find out how strong the students' feelings were towards the effectiveness of the media. The scoring for the four-point scale was: 1 for strongly disagree, 2 for disagree, 3 agree, and 4 for strongly agree (Tuckman, 1988: 219-220). The data were analyzed by measuring the central tendency (mean).

In order to make the above quantitative data easier to read, those data were converted into the interval of mean values on a scale of 1 to 4 using the range of the factual score. Suharto (2006: 52-53) states that the range of the score can be used to create score conversion by dividing the range with the objected categories as follows:

$$\frac{R = X_h - X_l}{4}$$

Note:

R : range

X<sub>h</sub> : highest score

X<sub>l</sub> : lowest score

The data from the open-ended questionnaire were analyzed descriptively as the consideration to revise the media to get the final product.