

## **CHAPTER II**

### **LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK**

This chapter presents review of literature related to the research study such as English language teaching in SMK, interactive multimedia, learning theories of instructional multimedia, language descriptions, autonomous learning, criteria of instructional multimedia, and multimedia development model. Once those theories have been reviewed, a conceptual framework is drawn for this study.

#### **A. Literature Review**

##### **1. English language teaching in vocational schools**

As stated in standard of content of vocational schools, (2006: 111-112), language has an essential role in encouraging intellectual, social, and emotional development. It is one factor that supports the success of other subjects. Through learning language, the students are expected to be able to know themselves, their cultures, and other cultures. Therefore, they are able to express their intention, feeling, and participate in the society.

Language is also a means of communication orally as well as in the written form. It is intended to understand and express information, thought, and feeling. In addition, language can be used to encourage science development, technology, art, and culture. Communication in this case includes four language skills, i.e. listening, speaking, reading, and writing.

English as one of the language subjects in vocational schools is determined as an adaptive subject. It is taught in order to provide the students of vocational

schools communication ability in English contextually that supports the study program. In addition, English provides daily communication ability as in this globalization era the students are required to be able to develop the higher level of communication. For vocational school students, mastering basic science and skill in English is aimed to support achieving the competence of study program and apply it to communicate in the spoken as well as written form in the intermediate level.

## 2. Interactive Multimedia

### a. Definition of interactive multimedia

Karrenberg (2007: 14) states that multimedia and interactive communication in the learning process simply mean communicating with all the senses. It means that the sense of hearing is the last sense to be acquired in the course of evolution. We may infer that our brain is mainly structured for the processing of information in images. Anyone reading a novel creates his own film at the same time. This explanation influences that interactive multimedia plays an important role in the success of teaching and learning process.

Lohr and Gall in Spector et al. (2008: 86) define interactive multimedia as the use of more than one form of media such as texts, visuals, video, animation, and audio in a way in which a user has a great deal of control over the choice or progress of the program. In other words, Bhatnagar et al. (2001:4) states that multimedia is a combination derived from multiple and media. To use it effectively, we have to understand not only how to create specific elements of multimedia, but also to design our multimedia system so that the messages we wish to express are conveyed effectively. To be able to create effective

multimedia, it is important for us to be sensitive to other multiple media such as TV and films.

Butcher-Powell in Mishra and Sharma (2005:61) states that multimedia is multisensory that engages the senses of the students. They define multimedia referring to a Web-based interactive computer-mediated application that includes various combinations of text, sound, still images, audio, video, and graphics. In another reference, Koumi (2006: 3) mentions multimedia is used to apply both to a computer package that includes video segments and to a multiple media course with video as an ingredient. Furthermore, he adds that a multimedia package could well include considerable texts, in order to present data for the learners to practice.

In line with the above definitions, Clark and Mayer (2008: 56) argue that multimedia presentation refers to any presentation that contains both words and graphics. The word itself can be in the form of printed text and spoken text while the graphics can be in the form of static illustrations such as drawings, charts, graphs, maps, or photos, and dynamic graphics such as animation or video. In addition, they explain that multimedia technology would become more elaborate in terms of realistic graphics, audio, color, animation, and complex simulations.

Vaughan (2008:1) defines multimedia as a united mixture of digitally manipulated texts, photographs, graphic arts, sounds, animations, and video elements. When those elements are organized into a multimedia presentation that allows the users to direct what and when the elements are delivered then it is categorized into interactive multimedia. Richards and Schmidt (2002: 265) add

that a multimedia presentation can be categorized interactive when they involve a question on the computer, a response from the student, and feedback from the computer telling the student if the answer is correct. Moreover, Morton et al. in Zhang (2008: 221) tells that interaction provides learners with opportunities to receive comprehensible input and feedback. Interaction allows learners to make changes to their own linguistic output.

Seel in Spector et al. (2008: 40) supports the above explanation. The use of media may change the characteristic features of learning environments, bringing about effects on cognitive operations, representational formats, interactivity, visualization of semantic structures, and feedback. More specifically, the perceptual organization of messages affects how learners encode information because it is responsible for the nature of the mental representations that learners construct as a result of interaction with media of communication. Media that combine visual and auditory presentation modes are called multimedia.

Mayer in Kingsley and Boone (2008/2009) mention two important points building up a learning multimedia; (1) presentation consisting of words and pictures and (2) presentation designed to promote meaningful learning. It is proven as the best technology to help students learn.

Ivers and Barron (2002: 2), in general terms, state multimedia is the combinations of several media to present information. The combinations may include texts, graphics, animations, pictures, videos, and sounds. Multimedia has two subjects; hypertext and hypermedia. Hypertext facilitates interaction

between readers and texts by organizing and linking information through text chunks. This is used to create associations, definitions, examples, and other relationships between the text passages. Hypermedia might add video clips, graphics, or audio files to hypertext.

Considering the above definitions, we may conclude that interactive multimedia in learning context is the combination of well arranged audio and visual media in the forms of texts, graphics, animations, sounds, and videos to present the learning materials that provide learners with opportunities to promote meaningful learning then receive comprehensible input and feedback.

b. Advantages and disadvantages of interactive multimedia

Interactive multimedia is close to the role of a computer as the center of the used media. This media can bring some advantages to those who are computer literate and also bring some disadvantages to those who are illiterate.

Lee and Owens (2004:123-124) state that one of the strengths of multimedia is the capacity for interaction. The amount of exciting work can be done through multimedia. Butcher-Powell in Mishra and Sharma (2005:61) mention multimedia enables both the student and the teacher to control the content flow of information. A major part of using multimedia in instruction involves engaging students' activities such as conversations and chats about external representations that use concepts, symbols, models, and relationships. As a result, multimedia has introduced important changes in the educational

system and has impacted the way teacher communicate information to the learners.

Clark and Mayer (2008: 57) mention multimedia presentations can encourage learners to engage in active learning by mentally representing the material in words and in pictures and by mentally making connections between the pictorial and verbal representations. Nevertheless, the developers need to consider the involvement of the media proportionally. Presenting words alone should be avoided as it may encourage learners to engage in shallow learning, such as not connecting the words with other knowledge.

Another advantage is mentioned by Koumi (2006: 83). There is also the advantage of a multimedia package all on one machine. Using CD-ROM as the device may extend segments of good-quality audio and video that can be incorporated into computer packages. In this case, learners do not have to change machines whenever the medium changes as they just need to select the menus available in the interactive multimedia.

In line with Koumi, Seel in Spector et al. (2008: 40) adds that interactive multimedia can connect motivational and cognitive features of interaction. In addition, Ivers and Barron (2002: 3) elaborate some advantages of using interactive multimedia as follows:

1. Integrating technology and curricula
2. Promoting active learning, inquiry, and problem-solving environments that engage the children in individual and collaborative work using higher-order thinking skills
3. Using technology to present and represent ideas
4. Developing new definitions of play and new conceptions of what constitutes a manipulative

5. Developing media literacy skills that involve critically analyzing the use of the technologies and the information derived from them.

Chang and James (2002) argue that interactive learning multimedia might satisfy the needs for exploration, manipulation, stimulation, knowledge to resolve problems, and self-enhancement as it has several features such as learner control, instant feedback, and use of authentic materials.

Tzevelekou et al. (2001) state that computers can promote a student centered way of learning. In this particular sense we might say that the teacher is no longer the key factor of the learning process.

Sankey in Mishra and Sharma (2005: 145) tells that one of the most obvious benefits of utilizing interactive multimedia is providing an arrangement of resources that can be incorporated into a lesson plan and providing learning experiences. However, if it is not handled correctly it may create disadvantages to the learning process as sometimes the teacher needs to add or deletes some materials considering the on the spot situation. Individual differences will bring some problems as well. For example, learners may have to direct attention simultaneously to different representations, especially if multiple representations are combined with other dynamic components, such as complicated sound, animated movement, and interactive text. This requires the learners to process large amounts of information at the same time.

Clark and Mayer (2008: 19) add the disadvantages of interactive learning multimedia. In this case, developers tend to use many elements to make it more interesting. Applying more elaborative in terms of realistic graphics, audio,

color, animation, and complex simulations will be fine. However, as we will see, greater complexity of media does not necessarily ensure more learning. The learners will even get confused due to the use of elements complexity.

Torrison-Steele in Mishra and Sharma (2005: 37) states some disadvantages that might appear while using interactive learning multimedia. The first is it is costly both in terms of time and money to produce the presentation. The second is the production process requires a high level of technical proficiency. The last disadvantage is that the content cannot be updated instantly since it needs some development and production process.

In line with Torrison-Steele, it is stated in North Central Regional Educational Laboratory paper (1997) that interactive learning multimedia not only has some advantages but also disadvantages in some cases. In terms of money, interactive learning multimedia is expensive. The use of computers as the main devices makes it expensive to develop. Another disadvantage is it is not always easy to configure and requires special hardware. In addition, interactive learning multimedia is not always compatible.

As the interactive multimedia developers we should take into account those advantages and disadvantages. Interactive multimedia will be much more helpful in facilitating the teaching and learning process if we can maximize the advantages and minimize the disadvantages of it.



### c. Elements in interactive multimedia

As mentioned in the definition part above, the elements of interactive multimedia are texts, graphics, animations, sounds, and videos. Each element has its own characteristics in the interactive multimedia.

#### 1) Texts

A Computer-generated text is the first element of multimedia. Texts can be said as the main element in multimedia. Vaughan (2008:50) argues that even a single word can cover a number of meanings. Bhatnagar et al. (2001:5) state that a few words appearing in a graphic multimedia system can have a powerful effect. Text and art can be mixed together in interesting ways to reinforce the message being transmitted. A text in multimedia has four major purposes as titles, menus, navigation, and content that can be animated in interesting ways.

Ivers and Baron (2002:71) propose some guidelines for specifying information related to text:

- a) Left-justify the text (not centered).
- b) Use mixed case (not all caps).
- c) Avoid long lines of text.
- d) Double-space text if possible.
- e) Keep sentences short and sweet.
- f) Use active tense.
- g) Chunk information into short paragraphs.
- h) Do not blink text unnecessarily.
- i) Use at least 12-point font size for hypermedia and Web pages.
- j) Use at least 24-point font size for presentation projects.
- k) Use generic fonts that are available on all computers.
- l) Do not place text on a background that has a pattern or graphic.

Text in multimedia has to work together with other elements of multimedia, such as pictures, animation, or sounds. Clark and Mayer (2008: 56) recommend that e-learning courses include words and pictures, rather than words alone. Because of this, text in multimedia should add to the information and not merely repeat it or present something entirely different. In other words, text has to be short and to-the-point.

## 2) Graphics

Mayer in Spector et al. (2008: 91) argues that students can learn better from texts and pictures than from texts alone. Graphics are any images or information in the computer that are presented via pictures, drawings, or paintings. Ivers and Baron (2002:89) graphics can be obtained through some ways. They can be created from scratch with a computer program, imported from an existing file, scanned from a hard copy, or digitized with a camera. Graphics can form some features such as symbols (pictographic or abstract), maps, graphs, diagrams, illustrations or rendered pictures (realistic to abstract), models, composite graphics (multi-images), photographs (still or moving).

When graphics are employed in the interactive multimedia, there are some procedures to follow. Ivers and Baron (2002: 93-94) propose some guidelines for specifying information related to graphics:

- a) use graphics to enhance the program and illustrate important concepts.
- b) do not include graphics that distract from the program.
- c) if possible, use several simple graphics rather than one complex graphic.

- d) if complex graphics are required, add arrows or highlight boxes to help focus attention on the relevant areas.
- e) if graphic icons are used for buttons, or other similar elements, be consistent, always use the same icon for the same function.
- f) be consistent when placing graphics—designate one part of the screen for graphics and another part for text, title, and so on.
- g) use 256 colors or fewer to help keep file sizes as small as possible.
- h) graphics should be created or scanned at 72–100 dpi (if they are going to be displayed on a computer screen).
- i) check copyright restrictions on all graphics that will be used outside of the classroom.
- j) graphics that are incorporated into web pages should be less than 50k (total for all graphics on one page).

### 3) Animations

Animations are graphic files that include movement. Animation provides a simplified visual view of a process or concept, catches eye, and makes things noticeable. Fahy in Mishra and Sharma (2005: 5) states the function of animation as the element in interactive multimedia that shortens learning times by illustrating changes in the operation, showing dangerous, rapid, or rare events; or explaining abstract concepts. However, as multimedia developers, we have to be careful in taking into account the animations proportionally; otherwise, it will influence learner's memory. Clark and Mayer (2008: 70) mention animation may overload the learners' working memory because the images are so rich in detail and are so transitory that they must be held in memory.

Vaughan (2008: 173) states some guidelines in making animation in the interactive multimedia. First, collect all activities that will be available in the animation. Second, create a storyboard to visualize the animation. Third,

select the best animation tool suited for the objects. The last is post-processing the animation with special rendering or adding some sounds.

Ivers and Baron (2002: 94-95) mention two kinds of animation; path animation and frame animation. A path animation employs an object that moves on a screen that has a constant background. A frame animation is more sophisticated than path animation. In this frame animation, several objects can move at the same time, the background can change, or the object itself can change into another object.

Bhatnagar, et al. (2001: 164) mention some techniques used in adding the sound into the interactive multimedia. First, create the animation. Second, select audiofile. Third, edit audiofile. Fourth, link the audio file to the animation by using either a package.

#### 4) Sounds

Sound in interactive multimedia can include recorded narration, music, and sound effects. Sound is proven to be able to support students' learning, as well as add enthusiasm and motivation to the program (Ivers and Baron, 2002: 96).

Wong and Sum in Chee and Wong ed. (2003:129) mention some functions of sound in the interactive multimedia such as:

- a) drawing attention of the students
- b) complementing the visual material on the screen
- c) supporting the students' reading text on the screen

- d) minimizing the amount of information that is required to presents on the screen
- e) announcing some events
- f) motivating the students

Koumi (2006: 79) states that sound can record some cases such as:

- a) experts' opinions
- b) personal experiences of interviewees
- c) human verbal interaction (real or dramatized)
- d) documentaries/recorded events (e.g. that illustrate abstract concepts with real-world examples), for listeners to analyze, evaluate, discuss
- e) informal study guidance (e.g. course introduction, remedial tutorial, exam advice), given by a personalized, sympathetic voice of a course tutor
- f) aural experiences and models of good practice: where the objects of study are the sounds themselves, e.g. music, language pronunciation, dramatic or poetic performance

Although there are some benefits of using sound in interactive learning multimedia, we have to be proportional in giving the sound portion in it; otherwise, there will exactly appear some bad effects. Clark and Mayer (2008: 70) state that based on the psychology of learning they recommend that interactive multimedia developers avoid e-learning courseware that includes extraneous sounds in the form of background music or environmental sounds.

In general there are two kinds of sound (Bhatnagar et al. 2001: 14) i.e. content and ambient sound. Content sound provides information to audiences, for example, dialogs in movies or theaters. Some examples of content sound used in multimedia are (a) narration: provides information about an animation

that is playing on the screen, (b) testimonials: could be auditory or video sound tracks used in presentations or movies, (c) voice-overs: used for short instructions, for example, to navigate the multimedia application and (d) music: may be used to communicate (as in a song).

In addition, ambient sound consists of an array of background and sound effects. These include: (a) message reinforcement: the background sounds you hear in real life, such as the crowds at a ball game, can be used to reinforce the message that you wish to communicate, (b) background music: set the mood for the audience to receive and process information by starting and ending a presentation with music, and (c) sound effects: used in presentations to liven up the mood and add effects to your presentations.

#### 5) Video

The last element in multimedia is video. Video is a medium of communication that delivers more information per second than any other element of multimedia we have considered. Apparently, video and audio are closely related, and together they are the most effective means of communication that can be a part of the multimedia system. Fahy in Mishra and Sharma (2005: 5) states that video can be used to show action and processes and to illustrate events that users cannot see directly or clearly in real time. Video, when used skillfully and artistically, can also emotionally move observers and can produce impacts affecting attitudes similar to in-person observation of real events.

Video offers some exceptional qualities that make it particularly useful in education. Since sometimes watching video is an inactive and boring activity for the learners, deciding how best to incorporate motion video in teaching and learning can be a challenge for the teachers.

Lever-Duffy and McDonald (2009: 350) state some guidelines in relation to the use of video in interactive multimedia. The first is using the potential of the medium; capture the motion to bring instruction to life and use motion to add movement to the instructional sequence. The second is using video to control the time; be sure video images allow enough review time, record sequences that are long enough to communicate the message, and use slow motion and time lapse to alter time. The third is adding special effects and text; add effects to emphasize the message and add text elements to clarify key points.

As other elements in multimedia, video has advantages and disadvantages as well. Steele in Mishra and Sharma (2005: 37) mentions that video is motivational, sound and images to convey information, is readily available, easy to use, inexpensive, while the disadvantage is linear information presentation, multiple copies for student access at home can be problematic/expensive, video production can be expensive and time consuming, requires VCR (video cassette recorder) access and display mechanism.

d. Teacher's and learners' roles in interactive learning multimedia

Bronkhorst et al. (2008: 271) states that teachers are the mentors and evaluators in interactive multimedia. Wong in Chee Ed. (2003: 36-40) argues that the teachers can play in three kinds of roles. The first is as the presenter. He elaborates some teachers' responsibilities as the presenters. The first is gaining attention. The teachers should make the topic relevant to the learners and try to relate the learners' interest. The second one is informing learners the objectives of the lesson. The teachers should let the students know what they will be learning.

The third responsibility is recalling previous-learned materials. In this case, the teachers should get the learners to recall what they have learnt before and to connect to the info. The fourth is providing guidance; the teachers help the learners to achieve the learning objectives. The fifth is obtaining performance. The teacher is in charge of asking the learners to practice what they have been taught. The sixth is providing feedback i.e. informing the learners how they are progressing. In accordance with the learning assessment, the teacher should also assess the learners' performance and evaluate the knowledge they have acquired. The last is enhancing retention and transfer i.e. helping the learners to remember and transferring their skills to other situations.

The second role is as facilitators. He mentions that the teachers in interactive multimedia should provide guidance, hold discussion, monitor the learners' understanding, and encourage their work. The third role of teachers is



as designers. The teachers in this case should design materials focusing on student-centered learning rather than teaching information.

In the same way, Bruner in Allesi et al. (2001: 51-52) mentions that learners play as the controllers of the learning. He states that learners should make the sequencing decisions about their own learning activities. It includes the ways learners concern a sequence of moving forward, moving backward, and selecting what to do next and pace (how fast processes occur).

In addition, there are some ways to follow in order to make the learners' control run well. The first is always permitting the learners' control of forward progression. The second is giving the learners help, complaints, glossaries generally and providing them with global control. The last is allowing the learners to pause, continue, repeat, or skip the movies, audio, or animation in the interactive multimedia.

### 3. Learning Theories of Instructional Multimedia

Language theories and instructional multimedia development are related to each other. Instructional multimedia can ease the teaching and learning process, while learning theories can take a part as the fundament in developing the instructional multimedia. There are three main learning theories that can be the basis of learning instructional multimedia development (Brown, 2000:8-11). They consist of behaviorism, cognitive psychology, and constructivism.

a. Behaviorist theory of instructional multimedia

Behaviorism is the oldest learning theory developed by B. F. Skinner, John B. Watson, Ivan Pavlov, and E. L. Thorndike in the 1940s and 1950s. Brown (2000: 22) defines behavior theory as the approach that focuses on the observable aspects of behavior, the widely observable responses, and the associations between those responses and events close to them. Learning behavior can be produced effectively by employing correct responses to stimuli. Particular response reinforced well will encourage habitual behavior. In relation to behavior theory, Harmer (2001:68) states that the result of learning is influenced by a three-stage procedure, i.e. stimulus, response, and reinforcement. Learners will achieve maximum mastery if those elements are concerned well. In line with Harmer, Brown (2001:73) argues that reward plays important role in learning. In addition, motivation is used as an anticipation of reinforcement.

Additionally, Schunk (2008:16) states that behaviorism theory explains learning as an observable process. It doesn't include internal events such as thoughts, beliefs, or feeling as the causes of learning are observable events. Behaviorism theory views learning as a transform in the pace, frequency of occurrence, and structure the response as a function of environment. It involves the formation of associations between stimuli and responses. Learning is seen largely to be a passive procedure, where the subject attempts to adapt to the environment.

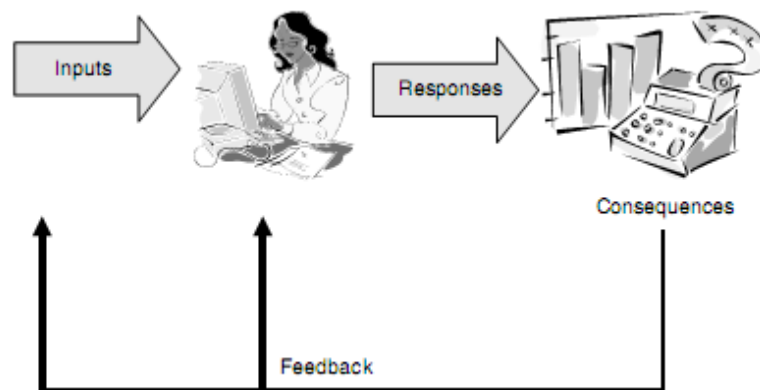


Figure 1: Behavioral learning process

Lever-Duffy and McDonald (2009: 31) state that educational technology appeared first in the development period of behaviorism. This influences Skinner, the developer of behaviorism, using such technology in teaching activity. This action is the foundation of the development of computer-assisted instruction (CAI). Clark and Nguyen in Spector et al. (2008: 511) state that behavioral systems model promote individual workers act on inputs (stimuli) in ways that produce results (responses) which in turn have consequences.

#### b. Cognitive theory of instructional multimedia

Cognitivism developed in the decade of the 1960s. There are some psychologists involved in this learning theory. They are Jean Piaget, Lev. Vygotsky, Bruer Jerome, Chomsky, and David Ausubel. Unlike behaviorism theory, cognitive theory emphasizes the acquisition of knowledge and skills in the form of mental structures and processing of beliefs. Schunk (2008:16) defines cognitive theory as the theory of learning in which the core concentrates on its construction, acquisition, organization, coding, rehearsal,

storage, retrieval memory, learning strategies, and comprehension monitoring. Ausubel in Brown (2000:10) explains that meaning, understanding, and knowing are the significant processes in learning in which less observable. This occurs based on the thinking process behind the behavior.

Koumi (2006: 216) proposes six principles of cognitive theory based instructional design of multimedia: split-attention, modality, redundancy, spatial contiguity, temporal contiguity, and coherence. The split-attention principle emphasizes that visual attention splits between screen text and visual appearance in which audio commentary is always superior to screen text. Modality principle says that learners learn better when the verbal information is presented in audio form as speech than in visual form. It can use narrated animation to represent a method for reassigning some of the processing demands from the visual form. The following principle is redundancy. It asserts that learners learn better from animation and narration than from animation, narration, and text if the visual information is presented at the same time to the verbal information.

The fourth principle is spatial contiguity. It states that learners learn better when on-screen text and visual materials are physically integrated rather than separated. In addition, temporal contiguity principle asserts that learners learn better when verbal and visual materials are temporally synchronized rather than separated in time. In the same way, coherence

principle asserts that learners learn better when extraneous material is excluded rather than included in multimedia explanations.

c. Constructive theory of instructional multimedia

The last theory is constructivism. This theory explains that learners construct their own perspectives of the world, through individual experiences and schema. In addition, the learners will search for other related information in order to enrich their achievement. This learning theory is developed by some psychologists such as George H. Mead, D. H. Jonasson, and D. N. Perkins. Brown (2001:11) states that teachers develop the lesson in the form of case study. This technique aims at enhancing learners' ability in solving a problem. Pratihari and Jain (2010:22) argue that one of the possibilities in developing constructive theory is claiming the existence of a solution under the formal logical representation of the problem and of the knowledge available for solving it.

The cognitivism also influences the learning media development. Since it concentrates on the acquisition of knowledge and skills in the form of mental structures and processing of beliefs, some techniques become the consideration in developing the learning media. They can be chunking, mnemonics, meaningful organization of the content, and giving practice for storing and retrieving information. Media that emphasizes on more practices is believed to be able to facilitate cognitive tasks that lead to an efficient long term memory. Bhatnagar (2002:171) states the indicator of cognitive ability is that how quickly the students can solve problems, how changes in the body

and brain are related to mental changes, how students differ in their responses, and how they are similar.

The implication of constructivism for the instructional developers is that learners should involve themselves to the content domains. Constructivists believe that learning might occur when it is situated, contextual, problem based, social, and authentic. Dagdilelis in Mishra and Sharma (2005:116) argues that educational software must be created according to the most up-to-date learning theories and, more specifically, constructivism.

In encouraging constructive learning, Koumi (2006:192) mentions some aspects to follow:

Spoken words should not be a literal duplication of the visuals (because you want to encourage students to make the picture–word connection for themselves), concretize: that is, relate to (hence activate) students’ previous knowledge, disclose the context of your arguments, e.g. set the scene before going into details, and support/scaffold the learner’s construction of knowledge.

She believes that knowledge is not passively received but actively built up by the learner, who selects information and organizes it in a way that is individually meaningful.

#### 4. Language Descriptions

In addition to learning theories, language descriptions also take into account for instructional multimedia development. Hutchinson (1987: 24-37) mentions there are six main views of language descriptions i.e. traditional

grammar, structural linguistics, transformational generative grammar, language variations and register analysis, functional grammar, and discourse analysis.

The first kind of views is traditional grammar. The principal view of this description is that conventional languages are formed by the grammatical function of each word in the sentence made by the use of appropriate inflections. The form of a word changes according to the function of that word; a subject, object, verb, and the like.

The second kind of views is structural linguistics. In this view, language grammar is described in terms of syntagmatic structures which carry the fundamental propositions (statement, interrogative, negative, imperative, and the like) and notions (time, number, gender, etc).

Some linguists believe that language was being analyzed and described in isolation from the human mind which produces it. In addition, there must be two levels of meaning in language itself i.e. surface level (performance) and deep level (competence). Surface level is the level in which thoughts are expressed by the language syntax. On the other hand, deep level is the level which is concerned with the thought organization. This is the principle of the third kind of view: transformational generative grammar.

The fourth kind of views is language variations and register analysis. This view sees that language as part of communication shows considerable variety. Any communicative act is formed by the number of contextually dependent factors.

In the same way, language function is concerned with social behavior and represents the intention of the speaker or writer. It influences the functional syllabus appearing the language used. This is the explanation of the fifth language view i.e. functional grammar. Additionally, the last language view, discourse analysis, says that same sentence can change with different contexts. The change is caused by two factors: sociolinguistic context and the relative position of the utterances within the discourse.

Those are the six language views that might influence language teaching and learning. Considering the students' background in this study, it will develop the learning media referring to the structural linguistics view was developed.

## 5. Autonomous Learning

Interactive learning multimedia can be used to promote autonomous learning. Kawachi in Mishra and Sharma (2005:162) defines autonomy in learning as an emphasis on the capacity to think rationally, reflect, analyze evidence, and make judgments. The result of autonomy is to know oneself and be free to form and express learners' own concept.

Learning motivation in a multimedia package is thought to provide some initial reason for learners to access the material. This may lead learners to take full control of their own learning. Technology may also provide for context and variety in learning tasks that theoretically can situate motivation. Seel in Spector et al. (2008: 48) states that generally, it has been argued that multimedia and computers



have the capacity to allow for external regulation and autonomy support. In addition, the various motivational factors as impacting learner control or, more specifically, the time and effort learners allocate to engaging with multimedia.

An autonomous learning often comes together with students' creativity. Debski in Jaccard and Kinder (2001: 43) states *for the student, multimedia allows some aspects of learning to occur on an autonomous individual basis and gives great scope to individual creativity, which can be a major incentive to learning*. This is due to the teacher allowing students to learn at their own pace, starting from their own knowledge base. Although sometimes the register of language still deals with complex questions requiring a lot of learning and reflection, the multimedia presentation is attractive, interactive. Moreover, it uses the tools and presents the audio-visual materials that are perceived by students as cool and fun which reduces the danger of discouragement.

In order to encourage autonomy in learning multimedia, the designers can create comprehensive inquiry processes that students can apply to varied problems, both in class and throughout their lives. This will be helpful to explore ways to ensure that these practices are internalized. The interactive models, simulations, and visualizations can support autonomy but often frustrate learners because they are too complex or too sophisticated. To enable students to make a use from models, simulations, and visualizations, designers guide interactions and seek ways to promote autonomy (Kali and Linn in Spector et al., 2008: 155).

## 6. Criteria of Instructional Multimedia

Mayer in Mishra and Sharma (2005:14) proposes seven principles for guiding the design of multimedia instruction in which the learners show to achieve greater retention and transfer as follows:

- *Multimedia principle*: Learners learn better from words and pictures compared to learning from words alone.
- *Spatial contiguity principle*: Learners learn better when corresponding words and pictures are presented near rather than far from each other on the page or screen.
- *Temporal contiguity principle*: Learners learn better when corresponding words and pictures are presented simultaneously rather than successively.
- *Coherence principle*: Learners learn better when extraneous words, pictures, and sounds are excluded rather than included.
- *Modality principle*: Learners learn better from animation and narration than from animation and on-screen text.
- *Redundancy principle*: Learners learn better from animation and narration than from animation, narration, and on-screen text.).
- *Individual differences principle*: A particularly important finding is that design effects are stronger for low-knowledge learners than for high-knowledge learners and for high-spatial learners than for low-spatial learners.

Bates and Poole (2003: 61) add some categories of well-designed interactive multimedia as follows:

- enabling learners to come to understandings more quickly than through more conventional verbal/ textual media
- helping learners have an image construction that is far richer than an abstract verbal understanding
- helping learners develop and practice skills
- enabling learners to move from concrete and specific examples to more general abstractions.

Koumi (2006: 64) argues that the analysis of the above media will consider seven types of media characteristics:

- symbol system – the types of symbols the medium uses to communicate, e.g. text, moving pictures, and or sound.
- access – the extent to which students are in a position to use the medium for learning
- controllability – how much influence can be exerted by students over the way they make use of the medium
- student reactivity – opportunities provided by the medium for student activity (including mental activity)
- interactivity – an action by a student receives feedback from the medium
- adaptivity – the medium is able to adapt its provision to suit an individual's needs, emulating the ability of an expert human teacher

- networking – the medium enables cooperation among learners and between learners and teachers

Clark and Mayer (2008: 56-58) state some principles in developing interactive multimedia as including both words and graphics and selecting graphics that support learning. Marill in Koumi (2006: 106) elaborates the five principles in relation to develop interactive learning multimedia. They consist of 1) setting learners' real-world problems, 2) activating learners' prior knowledge as a foundation for new knowledge, 3) demonstrating new knowledge to learners (rather than telling them about what is to be learned), 4) applying learners' new knowledge to solve the problems, and 5) integrating learners' new knowledge into everyday life. The second and the third principle can be served by educational video since it can bring atmosphere that stimulate activation and demonstration.

Lohr and Gall in Spector et. al (2008: 90) design principles in creating interactive multimedia:

1. Using words and pictures rather than words alone
2. Placing words and visuals close together
3. Simultaneously presenting words and pictures
4. Excluding extraneous words, pictures and sounds
5. Using animation and narration rather than animation and on-screen text or animation, on-screen text, and narration
6. Visuals for low knowledge and high-spatial learners

In relation to design the texts, menus, icons, and colors, Ivers and Barron (2002: 71-72) propose some guidelines as follows:

### Guidelines for Text

- Arrange left-justify
- Keep the sentences brief and clear
- Use minimum 12-point font size for hypermedia and Web pages and 24-point font size for presentation projects.
- Use generic fonts that are available on all computers.

### Guidelines for Menus

- Provide three-six options on a menu.
- Include an exit option on all menus.
- Provide the directions for selecting menu options.
- Put menu options in logical sequence.

### Guidelines for Icons and Navigational Buttons

- Put icons in consistent locations throughout the program.
- Use common icons for navigation.
- Make icons big enough for users to easily click on them.
- Provide instructions to help users navigate.
- Provide options for users to back up and exit.

### Guidelines for Color

- Use maximum seven colors per screen.
- Use consistent background colors (red is less recommended).
- Use consistent text colors.

Selected color in the background of the presentation lay out brings its own effect and so does in the text and navigation. Here are some reflections of used

color taken from  
[http://changingminds.org/disciplines/communication/color\\_effect.htm](http://changingminds.org/disciplines/communication/color_effect.htm) in October 8,  
 2010, 6:07 a.m.

**Table 1: Color reflection**

<b>Color</b>	<b>Meaning</b>
RED:	warmth, love, anger, danger, boldness, excitement, speed, strength, determination, desire, courage
ORANGE:	cheerfulness, low cost, affordability, enthusiasm, stimulation, creativity
YELLOW:	e
GREEN:	durability, reliability, environmental, luxurious, optimism, well-being, nature, calm, relaxation, Spring, safety, honesty, optimism, harmony, freshness
BLUE:	peace, professionalism, loyalty, reliability, honor, melancholia, boredom, coldness, Winter, depth, stability, professionalism, honor, trust
PURPLE:	power, royalty, nobility, elegance, sophistication, artificial, luxury, mystery, royalty, elegance, magic
GRAY:	conservatism, traditionalism, intelligence, serious, dull, uninteresting
BROWN:	relaxing, confident, casual, reassuring, nature, earthy, solid, reliable, genuine, Autumn, endurance
BLACK:	Elegance, sophistication, formality, power, strength, illegality, depression, morbidity, night
WHITE:	Cleanliness, purity, newness, virginity, peace, innocence, simplicity, sterility, snow

## 7. Multimedia Development Model

A model is required to develop this interactive multimedia systematically. There are some models proposed by some multimedia experts. Stoney and McMahon in Frey and Sutton (2010: 492) adapt Gould's model of multimedia development and identify the four basic phases as follows:

- (1) information design including the planning of the content and an analysis of the audience,
- (2) interface design which connects the learner with the content in the most functional and intuitive way possible,
- (3) navigation to connect the pages of content in a logical structure,
- (4) interaction design which determines how the program works and how the learner uses the program.

Furthermore, Seels and Glasgow in Frey and Sutton (2010: 492) also identify the five common components and develop the popular ADDIE model consisting analyze, design, develop, implement, and evaluate. In line with the above explanation, Allesi and Trolip (2001: 40, 409-412) propose the three phases; planning, design, and development.

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

a. Planning

- defining the scope

The area of the development should be described.

- identifying learners characteristics

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

- producing a style manual

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

- determining and collecting resources

The materials source that will be presented should be found out, selected, or established.

- obtaining client sign off

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

#### b. Design

- developing initial content ideas

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

- conducting task and concept analysis

The task and concept will be used in presenting the materials should be investigated.

- preparing script

The script will be used in audio and visual elements should be created.

- obtaining client sign-off



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

c. Development

- preparing the text

The text is transferred into the interactive multimedia.

- creating the graphics

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

- producing audio and video

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

- preparing supporting materials

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

- assembling the pieces

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

- doing an alpha test

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

- making revisions

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

- doing a beta test

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

- making final revisions

The media are revised based on the participants' evaluation.

- obtaining client sign-off

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

- validating the program

The final media are made in a complete appearance.

## **B. Conceptual Framework**

In this part, the conceptual framework of the research is presented. In this research, interactive multimedia is the combination of well arranged audio and visual media in the forms of texts, graphics, animations, sounds, and videos to present the learning materials that provide learners with opportunities to promote meaningful learning then receive comprehensible input and feedback.

In this research, interactive multimedia in the classroom will run successfully if the teacher plays their roles as a mentor, evaluator, presenter, and facilitator while the students play as the controllers of the multimedia application. In line with the role as controllers, this interactive multimedia can be used as the media in facilitating autonomous learning in which the learners learn the material without teacher-led activity.

Based on the literature review, English as one of the language subjects in vocational schools is an adaptive subject. It aims at supporting the students to achieve the competence of study program and apply it to communicate in the spoken as well as written form in the intermediate level. In order to achieve the goal, the teaching and learning process should be designed to meet the students' needs. Teachers are expected to be creative in developing the materials and also the media to support the teaching and learning process as it can avoid monotonous activities. Students need to be given a chance to explore the materials. While exploring materials, continuous feedback and guidance are important.

In relation to the development of interactive multimedia, it is expected to enhance the language teaching because it integrates texts, graphics, animations, sounds, videos, learning materials, and feedback. The texts are functioned as titles, menus, navigation, and contents which work together with other elements of multimedia, such as graphics, animations, or sounds. The graphics used in this interactive multimedia form some features such as symbols, graphs, illustrations, models, and photographs. The third element is animation. The animation is used to move other elements; texts as well as the graphics. The sounds used in this interactive multimedia include recorded narration, music, and sound effects. The next element is video. It is used to show actions and processes and to illustrate events that users cannot see directly or clearly in real time. The media also contain learning materials presented in various presentations and completed with the feedback.

The interactive multimedia in this research is developed by adapting Effective Communication English textbook. The book has passed the selection held by one of

the ministerial decrees of national education, so that the quality of the content is guaranteed. The materials of the book are developed into two cycles, spoken (listening and speaking) and written (reading and writing). Those cycles contain some activities that will be more facilitated when they are presented in the interactive way, such as pronunciation, guessing the meaning, practicing dialogue, identifying synonym, completing dialogue, and some grammar items.

The interactive multimedia tries to provide the activities interactively to support the self learning activity. The activities are designed in the form of dragging (the jumbled conversation, the correct answer), clicking (the correct answer), typing (the correct answer), watching (the video of conversation), and listening (the recording of conversation and pronunciation). This also presents some feedback after the students complete the activities that have not been yet provided by the book yet.

Based on the explanation above, the use of interactive multimedia is important to support the English teaching and learning process more interesting. And then, this research aims at developing effective interactive multimedia software for “Effective Communication” English textbook for the Elementary Level Students of SMK.