CHAPTER II
LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents the literature review on the fundamental study of multimedia in education. The fundamental concepts that have used in this research work are discussed in detail. Previous research on the multimedia world, education theories, teaching of English as foreign language, storytelling approach and some related works are also reviewed. The state of art will be elaborated in the next sections.

2.2 MULTIMEDIA

In the world of education these days, teachers are not the only source of knowledge anymore, but they function more as a guide, manager and motivator in the teaching and learning process. The use of sources, approaches and strategies have to suit all students who have different learning abilities. With the development of computer and multimedia technology, many educators have resorted to use this technology as a learning tool in order to improve the students' proficiency in the learning process.

The multimedia concept involves the combination of graphics, images, audio, integration of texts, video and digital environment, has been used in the entertainment industry, education, corporate communication and as a source of reference since it has

coped with their expected goals (Cereijo 2008). In education currently, multimedia has become the preferred teaching aid by most teachers while handling the class. This is true as in the statement *"Most school systems in the developed world are including computer literacy or similarly named programs, into the curriculum"* (Multimedia Literacy online 2009). As a developing country Malaysia has now joined this trend by incorporating the computer technology such as multimedia into its education system.

History has shown that the use of computer in formal education was first introduced in Malaysian schools in 1981 when 20 schools were selected to be in the pilot project of computer in education' (Wan Fatimah 2004). Later, in the year 1990, the Faculty of Computer Science and Information System, Universiti Teknologi Malaysia (UTM), organized a computer technology course entitled *"Pembangunan Perisian Kursus Untuk Pengajaran Berbantukan Komputer"* for school level. The objective of the course was to introduce school teachers to computer literacy and to guide them in developing an educational software as the Computer Assisted Instruction (CAI). The Ministry of Education has provided some media. However, the amount and its application were still less than the usage of the established method: text book and oral teaching (Salmi 2000).

By late 1996, Smart School had become one of the seven flagship applications of the Multimedia Super Corridor, MSC (MDeC 2007). The Malaysian Smart School is a learning institution that has been systematically reinvented in terms of teaching-learning and management practices to help children cope with growing information. Through this program, computer and multimedia technology will become the main medium in the process of teaching and learning (MDeC 2007). All of these efforts are geared toward achieving the main objective of multimedia technology in education; to help both teachers and students in enhancing the teaching and learning process, respectively. Multimedia technology is useful either for individual or group learning as in school.

Many researches that have been conducted previously have shown that the use of computer technology, multimedia and telecommunication in teaching and learning process, called as Computer Aided Instruction (CAI), have positive impact to teaching and learning performance at multilevel of education field (Vietti 2005: Mulbery & Paper 2006; Galvis & Schultz 2007).

There have been studies on the comparison of the effectiveness (in terms of achievement scores) and efficiency (in terms of instruction time) of CAI with traditional instruction for various needs and in various subject areas. Jenks and Springer (2002) reviewed CAI studies and reported that there was an increase in achievement scores. Besides, CAI such as e-Learning can improve students and school results (Linckels et al. 2006). Thus, students' attitudes became more positive toward schooling and schooling time was about one-third less than the classical schooling method.

Another study carried out by Hamza et al. (2000) stated that teaching creatively for effective learning demands a migration from inherited practices of instructing, thinking, and using computers as mere drill and practice appliances to the use of computers and computing technology as the main tools. A study from Demetriadis et al. (2003), discovered the use of various media in learning process and in learning setting had increased students' interest and motivation. These researches have shown that multimedia has been accepted as the major aid in the education field and has been discussed for several years.

2.2.1 How Multimedia Can Help in Education Field

Multimedia Technology is able to fulfill the various learning requirements and for any type of student provided that it is equipped with a good design of teaching methods, teaching theory and a suitable teaching approach. Since the 90's, Wang et al. (2002), Koenig et al. (2005) and Ahmad Fauzi (2007) have agreed to the use of multimedia as a

demonstration tool, tutor and as a tutorial tool. As a demonstration tool, multimedia can help students through visual presentation that illustrates the important content relating to the real world, allows repeated retrieval of the contents easily, which allows for better preparation before the class session.

Besides, another study by Lewis (1997) (as cited in Salmi 2000), he discovered that the majority of several recent researches, either formal or informal, have concluded that students' grades and interest in any subject can be enhanced if the aspects of interactivity, visual and tutorial based on computer have been applied. The computer base tutorial can provide practice exercises to keep the students occupied during the class session. Lewis also agreed on the usage of multimedia such as audio, visual and animation throughout the teaching and learning processes since the multimedia is able to offer more than the traditional chalk and talk.

Lewis also discussed the interactive technique for object manipulation on computer screen, which will allow students to see the reaction of their act by visual effect. Lewis suggests that interactive multimedia courseware can be a patient tutor for it can be used repeatedly and as frequent as desired by the students. In addition a student can leave the topic that has been explored and go through the next topic individually without having to wait for the other students in the class.

In another study, multimedia has been shown as the best technique for increasing information constancy in memory because its approach involves many receptors and stimuli. According to Ee Ah Meng (1993), the study has shown that percentage of information received by a learner depends their receptors. The use of multimedia would be able to enhance the quality of teaching and learning practice because multimedia itself is the combination of graphics, images, audio, integration of texts, video and digital environment (Felman 1994; Halimah 1996). These components of multimedia have

different effect for increasing the learner's memory storage as indicated in Table 2.1 below:

Table 2.1: Effectiveness of multimedia component for memory storage

Element of Multimedia	Process	Percentage Gained
Graphic, video, images	Seeing	75%
Audio, video	Hearing	13%
Integration of texts	Touching	6%
Digital environment	Feel	3%

This fact is supported by the report from Computer Technology Research (CTR) as cited in Mohd. Azlan (2008), which reported that students can retain only 20% of what they see, 30% on what they hear, 50% of a combination of those 'see' and 'hear' activities, and 80% of what they see and hear simultaneously. While in the research by Galfo (1975) (as cited in Salmi 2000) to determine the effectiveness of *see-hear* tools application, he has found that the process of simultaneous see-hear is more effective than separate *see-hear*.

Those earlier works on the use of multimedia in education have shown that the benefits of multimedia in the education field depend on how it is being used: as a demonstration tool, tutor, interactive concepts, or computer based tutorial. Some of the researches also have proven that different elements of the multimedia have different effect on increasing memory storage. Whatever application provided by the multimedia, the objective is to give benefit to the people in learning, especially to the students.

2.2.2   Benefit of Multimedia

Stember as cited in Uden and Campion (2000) agreed that the interactive multimedia technology has influenced the way people work, learn and communicate. The interactive multimedia program in education has reformed the computer-based teaching materials where learners can learn independently in an interactive environment and in a meaningful way (Bagui, as cited in Estela et al. 2008).

As known, everyone has their own style in learning some may be interested in learning by own self, while some like to study in group. Most students prefer visual learning compared to audio learning technique. In addition there are some students who are not able to focus their attention to the teachers in a traditional classroom. However, with computer based learning, these types of students will be able to give more attention since multimedia provides many advantages. Waddick (1994) and The U.S Department of Education (1996) (as cited in Wan Fatimah and Halimah 2001) have stated the overall advantage of multimedia which included:

- Helping students to master their skills requirements for the workforce.
- Enhancing the ability to remember and understand material.
- Helping students to become independent learners and improve teachers' skills and knowledge.
- Students can work at their own pace.
- Students get constant feedback on progress.
- More flexible access to education.

- Reduction of lecturer activities coupled with more active student centered learning.

- More time for teacher to talk with individual students.

- Fewer students waiting for assistance, thus increasing student motivation.

- Students cooperatively help one another.

- A more relaxed classroom atmosphere.

- Increased mastery, especially by weaker students.

- Consistency in course content.

- Reduces 'catch up' problems if a student is ill.

These benefits of multimedia have been proven by Walton (1993) and Burgess (2000) in a study by Wan Fatimah (2004), both of them have concluded that multimedia usage can improve students' performance more than 56%, reliable students' achievement about 50%-60%, learning curve about 60% and reliability to maintain the contents is 25%-50%.

This shows that multimedia has been widely used in the education field to help students increase their learning performance. In addition, multimedia has become the popular tool of CAI and CAL as well as being adapted into courseware applications.

2.2.3 Multimedia Courseware

Software contains a group of instructions that instruct the computer to do any specific steps. Meanwhile, courseware is a type of software but it is more focused as educational software. Due to the many advantages of multimedia technology as a teaching aid, many educators have turned to using multimedia courseware to achieve the learning objective. Nowadays, there are many multimedia courseware that have been developed for applications ranging from preschool to high school level. There has also

been some courseware developed for higher learning institutions, even though the number is few.

Zurina (2005) has successful developed a multimedia courseware for preschool mathematics. She integrated four education components, which are learning component, exercise, activities and support component in the courseware. The learning theories that have been adapted are constructivism, thematic and contextual approaches to allow learners to construct their own knowledge, and to relate the knowledge to their daily life activities. An interface was created to suit the preferences and suitability of the user age.

Another multimedia courseware that has been developed is by Devaraju, et al. (2007), who produced a multimedia courseware for dyslexic children in their preschool. They have also proposed a theoretical framework based on their research in dyslexia theory with Dual Coding Theory and Scaffolding instructional technique, which have been used in the courseware prototype.

Both multimedia coursewares have incorporated some theoretical aspects of teaching and learning. What is exactly meant by the educational concepts and the pedagogical approach will be explained in the next section.

2.3   TEACHING CONCEPTS

With the intensive development in information technology, the dissemination of information can be achieved through various methods either formally or informally. Nonetheless, how the information is delivered is always the primary concern among many academicians. Teachers always give the most attention to their teaching methods and, similarly students give most attention to their learning. The teaching and learning practices are part of the education scope, which play an important role in human capital development.

Ee Ah Meng (1997) has defined teaching as a process to deliver skill, knowledge and value. Besides, teaching can change the students' behavior. Normally, teaching a topic can be done by explanation, demonstration, experiment or combination all of those methods. It is the art of being a teacher which is called as pedagogy approach. Many ways can be found to teach any of the knowledge. Nowadays, teachers deliver the subject matter using materials such as slide presentation, chalk, film or sometimes using computer software. For effective teaching material, teacher should be sensitive in addressing the issues as follows:

- Objective of the topic,
- Contents that deliver the objective,
- Teaching technique that suit students' ability and,
- Students' interest should be planned and created.

According to Salmi (2000), there are three popular teaching models: Robert Glaser, Sim and Taba. These three models are designed to ensure the effectiveness of teaching practice. Robert Glaser has designed a teaching model which includes four components namely Teaching Objective, Current knowledge, Teaching Technique and Evaluation. On the other hand, the teaching model of Sim explored the interaction of five components of teacher, student, objective, content and the environment.

Hilda Taba (1962) has arranged the teaching material by following the principle from the data pattern of concrete to abstract. After that, the established knowledge will arrange to unknown knowledge and finally from the easy to difficult matter. The arrangement of the teaching materials is to make learning easier than before. See Figure 2.1. The Taba Model also concerns the relation between students' knowledge with the planning and learning process as shown in Figure 2.2.
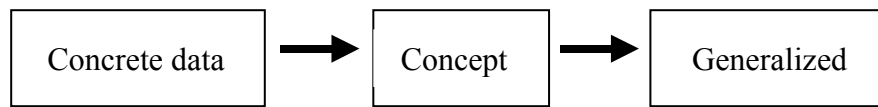
Concrete data	→	Concept	→	Generalized

Figure 2.1: Teaching Material Arrangement

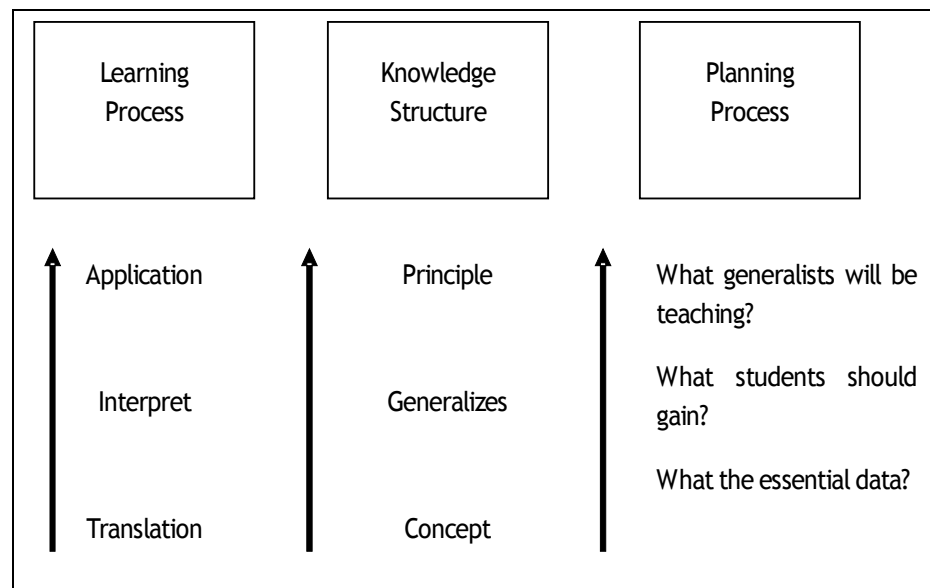| Learning Process	Knowledge Structure	Planning Process
↑ Application	↑ Principle	↑ What generalists will be teaching?
Interpret	Generalizes	What students should gain?
		What the essential data?
Translation	Concept	

Figure 2.2:   Hilda Taba Teaching Model

The success of any teaching style depends on the performance of learners with the method given. Sometimes, even when the teachers have given the best effort in their teaching, students' achievements are still average. This can be improved if the teachers and students know and use the right learning concepts because the most important matter is how the learning practice has been applied among the students.

2.4   LEARNING CONCEPTS AND THEORIES

According to the Sim Teaching Model, there are five components in education practice, and one of them is the student. Student may learn any information either by formal, informal or non-formal situations (Ee Ah Meng 1997).

Formal learning is defined as the learning through formal process, which means learning a topic in a systematic system that has been sorted according to the individual age group. Informal learning on the other hand is defined as indirect learning of skill, expected or unexpected knowledge, attitude and value. While the non-formal learning is more advanced than formal learning since it has more systematic and has more organized activity. No evaluation is needed during the non-formal learning (Ee Ah Meng 1997).

Even though there are many different techniques of learning, a successful learner is a person who is able to relate the current information with the new information. This connecting process is declared as learning concept by Ee Ah Meng (1997). Learning concept also can be defined as a process to get knowledge, skill, improve self-attitude and etc. This concept is divided into several learning theories.

However, learning theories have been contributed by a line of research from the field of education psychology. The learning theories are important in order to relate the techniques of learning among students to the teaching techniques by teachers, or any teaching tool. The objective of study can be gained effectively through the combination of the right teaching techniques and tools.

Psychology, ICT growth and pedagogical methods have mostly supported the use of technology in education. However, among the three factors, psychology has been identified as the major contributing factor towards the successful combination of the study theories and principles. Three learning theories will be used during the development of the BC-C prototype.

2.4.1 **Behaviorism Theory**

Behaviorism theory basically is the conditioning process where learning is achieved through the strong relation between stimulation and response. Behavior psychologists define learning as the repetitive process of stimulation and reaction, which come with the same range at the first learning until both elements get well together firmly.

However four aspects are suggested during the behaviorism learning process, which include reinforcement, generalization, discrimination and evaporation. These four aspects describe the behaviorism theory. According to Salmi (2000), their explanations are given in Table 2.2 as follows:

Table 2.2: Behaviorism Aspects

Aspect	Explanation
Reinforcement	Reinforcement can influence students to repeat the reaction on learning with the technique that give satisfaction to themselves.
Generalization	Generalization is important to make relation process happen
Discrimination	Students need to know how to discriminate new information from old to reflect on the study process.
Evaporation	Evaporation needs to be done to erase the wrong reaction. If not, the learning process among students will be slowed down and haling acceptance of skill and knowledge.

2.4.2 **Cognitivism Theory**

Many researchers agree that cognitivism theory is the enhancement of behaviorism theory. As stated in the *thinkquest* website (2009), cognitivism is learning through listening, watching, touching, reading or experiencing then processing and memorizing the information. Furthermore, according to Ee Ah Meng (1997), every time a student learns, he or she will collect and arrange the experiences and information into the

memory. That process of collecting any data is called as cognitivism structure. This theory is more effective than behaviorism theory since the behaviorism theory only suggests the "try and error" process, which is more suitable for learning simpler subjects; besides its probability of succeeding for more difficult subject is overestimated.

Cognitivism also has been described by Schneider (2006) as a learning theory to achieve the knowledge objective. Further more, according to Nor Faizah (2004), cognitivism approach offers the learner to remembering and arrange the data on what they have learnt. The data will be processed and stored in the memory. Four cognitivism learning styles have been declared by People and History (2008) as shown in Table 2.3.

Table 2.3: Four Elements of Cognitivism Learning Style

Element	Explanation
Learning thru scanning the contents	Differences in the level and intensity of attention follow-on dissimilarities in the intensity of experience and the width of awareness.
Leveling versus sharpening	Individual dissimilarities in remembering that relate to the uniqueness of memories and the learning to combine similar events.
Reflection versus impulsivity	Individual consistencies in the speed and satisfactoriness with which alternative hypotheses are formed and the responses made.
Conceptual differentiation	Differences in the tendency to categorize perceived similarities among stimuli in terms of separate concepts or dimensions.

Furthermore, Salmi (2000) has reported that one of the famous cognitive psychologists, Kohler, has suggested that "*the smart-brain is a mental ability that supported human being in relating the surrounding elements unconsciously to solve the occurred problem*". Kohler learning theory also has suggested that:

- Teachers have to play a role in supporting students to use their smart-brain to solve problem.
- Teachers have to support students to use perception skill so that they can relate each element in their surrounding.
- Learning has to be presented stage by stage using question and answer technique to train student to settle any problem matter.

A second famous cognitive psychologist, Piaget, had continued focusing the study on children cognitivism approach. He had provided an excellent model of epistemology and the study of the advanced genetic epistemology. Epistemology is a perception of the unchanged sequences during the enlargement of intelligent reaction.

From his research, Piaget found that children were different and can be changed according to the age chronology. He divided the age to four categories of stage which are: stage of Motor Sense (0-2 years old), stage of Pre-operation (2 -7 years old), stage of Concrete Operation (7- 11 years old) and stage of Formal Operation (11 years old and above). According to him again, at the Formal Operation stage:

1. Students at this level are able to use their sanity and think theoretically.
2. At this age, they can scrutinize their feelings and thoughts.
3. Able to apply the principles during problem solving.
4. Able to make hypothesis during problem solving.
5. Schemata quantity (mental structure for individual to organize his surrounding) will be increased.

According to Ee Ah Meng (1997) again, Formal Operation also include the ability among students to solve the concrete and abstract problems. By knowing this stage operation, teachers have the opportunity to increase the effectiveness of their teaching styles and at the same time can improve students' performance.

Another famous cognitive psychologist is Gagne (Gagne 1974, as cited in Jintavee & Ed. D, 2008), who stated that learning started from the simple to the tough level. The higher learning level is dependent and related to the level before. Gagne theory had inspired Schneider (2006) to investigate Gagne's suggestions on handling the class during the teaching process. The sequences of situations should be arranged accordingly since it can help to process the interior and critical cognitive information during the teaching course. Nine situations were mentioned, which are:

- Get the attention.
- Present the learning objective.
- Remember the past lessons.
- Present the course contents.
- Give the guidance/ assisted learning tools.
- Get to know students' behaviour via asking question.
- Get the right response.
- Examine the performance.
- Pertain the memory and transfer the learning.

In summary, cognition is a process of collecting data to be stored, and processed in the memory storage. So, the data can be recalled when needed. A majority of famous cognitive psychologists have defined the different types of method to earn the data such as stated by People and History (2008) in Table 2.3. However, according to the findings by Piaget, the chosen method usually depends on the age of the learner.

2.4.3 Constructivism Theory

Constructivism is the most advanced theory compared to behaviorism and cognitivism. Many educators have agreed that constructivism approach is the most effective approach for learning activities. Constructivism learning as defined by Schneider (2006) is about the ability of the learners to construct the knowledge or their previous experience into their own understanding. The main issue in constructivism learning is the practice of explaining the '*why*' question. For that, based on the information that has been processed in the brain, the learners are able to relate the knowledge to their daily lives.

Learning is an active process. It begins with the manipulation of current information acquired during the cognitive process. In the brain, the information then will be processed again to construct a scheme. Next the scheme will be changed and enlarged through assimilation and accommodation procedures. These entire process are defined as cognitive constructivism by Piaget. The combination between cognitivism and constructivism will influence students' ability to create meanings mentally in their surrounding.

Besides cognitive constructivism, radical and social constructivism also have been part of the constructivism theory. Radical constructivism is the constructive process on the experiential data in the individual memory, while social constructivism is the process of constructing the knowledge through social processes such as interaction, conversation and etc.

There are five methods to implement the constructivism teaching (Concept to Classroom 2004): teacher should create relevant problem statements that can be solved by students, the learning must be structured around the necessary concept, teacher must be aware of students' way of reasoning, the established curriculum should be adapted to address teacher students' supposition and development, and the last technique should assess students' learning (Buttler et al. 2007). According to Wikipedia on Multimedia

Literacy (2009), the majority of people who are involved in ICT have agreed on the power of ICT tool in supporting constructivist learning for being:

- An active and highly motivating engagement with students.
- A powerful tool to create text, art, sound, models, presentation, movies, etc. that produce high quality products and remove much of the tedium normally associated with such creation.
- An error-forgiving environment in which editing of the product fosters learning by trial and error.
- Easy communication in text, voice, video.
- Quick access to information and resources.

Apart from that, constructivism has been mentioned as a non-directed learning besides giving open-ended learning experience. Thus, boredom phenomena could be avoided since students have the opportunity to relate the learning materials to their lives, make a guess, and can get inconsistent challenges for what they believe in (Waddil et al. 2006).

All the techniques of learning theories such as behaviorism, cognitivism and constructivism are good to be applied during the class session. However, the selected theory must be suitable to the domain of the subject in the class to ensure the objective of learning is achieved.

2.5   TEACHING ENGLISH AS A SECOND LANGUAGE

The status of English status in Malaysia schools is categorized as a second Language. Many efforts have been taken by the government to support the learning of English language. Kementerian Pendidikan Malaysia (2001) has reported that, "*Skills such as listening, speaking, reading and writing are emphasized upon in the current*

English curriculum with the series laid upon the importance of grammar, vocabulary and spelling as well". This shows that English is such an important language in the Malaysian curricula, which is being taught from the pre-school level to the university level. With the re-introduction of English as the medium of instruction for Mathematics and Science in Malaysian schools since 2003, the learning of English language has become more important than before.

Basically, English teaching is divided into Communicative Language Teaching (CLT), Structural English Teaching (SET) such as grammar, and the Behaviouristic English Teaching (BET) (Ontesol 2008). In learning the English language, the main aim is to master the vocabulary in order to expand the usage of English words. There are also literatures on English for students. The literature could be presented in the form of poetry, short story, nonfiction, drama and so fourth.

A study of the literature usually involves discussion on the literature components for example the theme, setting, character, moral value, the conflicts and etc. Nonetheless, Furr (2004) in his article entitled "EFL Literature Cycle" has discussed the phenomenon of boredom during the language or literature reading. Most students are resistant to the reading process. That is a fact. Furr (2004) also said that, *"Even native English speaking students often claim that their "least favorite," "most hated," or "most difficult" courses in high school are their Reading or Literature classes"*.

EFL literature circles according to Furr (2004) once again have allowed EFL students to have real meaningful discussions about literature in English. There are about ten features of the EFL literature cycles, which can be concluded as: during the literature learning, students must discuss the given topic in groups where the teacher acts as a facilitator rather than an instructor for all groups.

Since the use of English language in Malaysia is expanding, the Malaysian students should be provided with the necessary tool to learn English literature in an effective way so as to improve the English language proficiency of the students. There are many ways to learn the English literature. However, storytelling approach has been proven as a good method of learning English literature.

2.6   STORYTELLING APPROACH

"Stories are an enormous language treasure. Many old stories are regarded as the models of language and treasures of the culture, from which learners at various language levels and age groups can find suitable stories to read and tell", Xu Jiang (2007). Nevertheless, according to Myers (2004), English language lessons will be more exciting compared to the English language traditional learning if the storytelling approach has been used. Besides, the level of language learning can be improved when storytelling are being included in the Curriculum (Shih et al. 2007).

Almost all of the dictionaries define story as a narrative event of imagination or real life. Story is used to deliver freedom, trust and value of humanity and others. It is because story is a knowledge block and can be defined as a basic learning approach. Murray (2008) has defined four elements that should be contained in a story:

- The current situation. (Example: What's going on now in the story?)
- The thoughts and feelings of the characters. (Example: What is their thought or feeling?)
- The preceding events. (Examples: What happened before? What led up to this current situation?)
- The outcome. (Example: How does the story end?)

Thus, through the elements in the story, someone can know the time, location, why and how something happened. Besides, people can know the past, current events and the time in future (National Storytelling Member Associated (NSMA) 2008). However, NSMA also has stated the situation of "telling" as:

"*"Telling" involves direct contact between teller and listener. It mandates the direct presentation of the story by the teller. The teller's role is to prepare and present the necessary language, vocalization, and physicality to effectively and efficiently communicate the images of a story. The listener's role is to actively create the vivid, multi-sensory images, actions, characters, and events---the reality---of the story in their mind based on the performance by the teller, and on their past experiences, beliefs, and understandings. The completed story happens in the mind of the listener, unique and personal for each individual*", (NSMA 2008).

Determining the definition of storytelling is difficult. Nonetheless, *"Common researchers verified the definition of storytelling as a concept of a sequence of events that include the passage of time and conveying the meaning, and a story is communicated intentionally"* (Guha et al. 2007). Apart from that, Storytelling Community has concluded that storytelling is a narrative structure with the type and special set that complete each other. During a storytelling process, a storyteller, a story and at least a listener should participate (Storytelling Art of Indiana 2007).

The advantages of delivering a subject by the way of storytelling include (British Council Teaching English online 2008):

- Storytelling can create a feeling of well being and relaxation.
- Amplify students' willingness to communicate thoughts and feelings.
- Encourage active participation in the classroom.

- Increase students' verbal proficiency.

- Encourage students to use the imagination and creativity.

- Encourage cooperation spirit between students.

- Boost listening skills among themselves.

Besides, the Storytelling Art of Indiana (2007) also has investigated the benefit of storytelling to the students. Their study revealed a similar finding with Tendero (2006) since the benefits are gained through the techniques of listening, writing and the technique of re-telling a story.

It seems that storytelling is a practical, established and powerful teaching methods especially language learning, such as English. It is because this approach offers many advantages to the students and teachers during the class session. However, storytelling is divided into several types, which are the Interactive Multimedia Storytelling and Thematic Storytelling.

2.6.1 Interactive Multimedia Storytelling

"*Multimedia story is some combination of text, still photographs, video clips, audio, graphics and interactivity presented on a Web site in a nonlinear format in which the information in each medium is complementary, not redundant*", (Multimedia Journalist online (MJO) 2008). There are three steps to create a multimedia storytelling.

1. First step, the story that is intended for publishing should be chosen first. *"The best multimedia stories are multi-dimensional."* Multi- dimensional means that the stories should have elements of multimedia included; the video, stills, audio and info graphics. The preliminary info should be collected by doing research, rough out interfaces or storyboard, conducting preliminary interviews and content should have been collected to get ideas of the possible story component.

2. Second step is to find a focus and project plan, which can be called as doing the story boarding. *"A storyboard is a sketch of how to organize a story and a list of its content"*. The main reasons of the project plan are:

- To find the parameters of the story.
- To organize and focus on the story.
- To make a decision which media to use.
- To identify any holes in the story.
- To list all necessary resources to finish the whole story.

Some of the literatures have outlined the steps involved to create a rough storyboard which include: dividing the story into its logical, nonlinear parts, and the next step is dividing the contents among the media such as video, photos, audio, graphics and text.

3. The third technique is gathering the content for nonlinear storytelling. To gather all the content, the required equipments that have been suggested are the cables, headphones, laptop, DV tapes and etc.

The multimedia storytelling can be an interactive application if the elements of navigation and interactivity are adapted. Thus, it can be called as an interactive multimedia storytelling. This is supported by Per Christiansson (2001), (as cited in Fadhlina 2004), where in his article, he has suggested that storytelling can be an Interactive Storytelling when the same basic data are presented in many different ways. His model of Interactive storytelling is shown in Figure 2.3. By using computer technology, any stored data of multimedia story can be easily modified in many ways such as:

- Non-linear presentation for the user's navigation

  This feature allows the users to go to any pages to see the wanted scenes and they can look-up for an explanation of the scene easier. Users also have the opportunity to give fast feedback for that presentation of the multimedia story.

- Easy story scene presentation for the user's navigation

  The story scene can be created easily. Images for instance the room, map and etc., can be used to describe the whole scenes in the multimedia story.
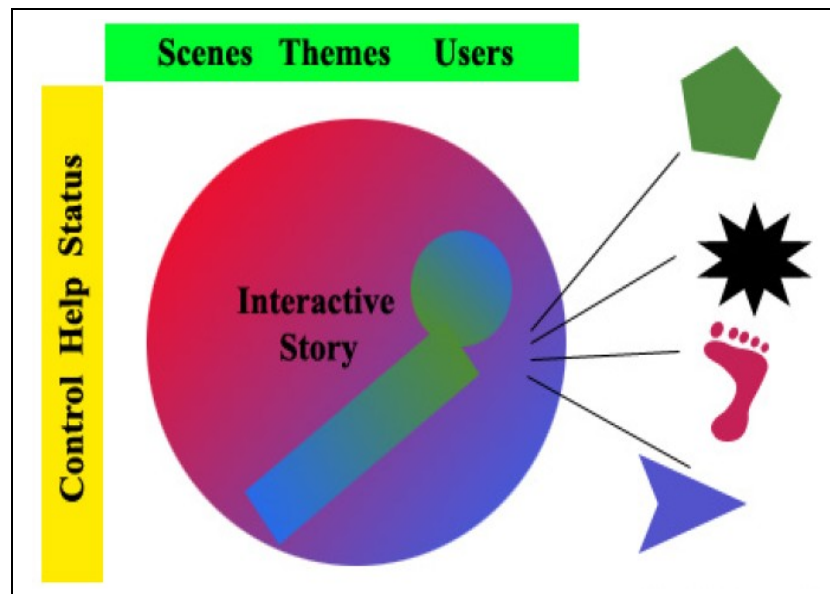

Figure 2.3: Interactive Storytelling by Per Christiansson

Source: Fadhlina 2004

2.6.2   Thematic Storytelling

Oxford dictionary (2000) has declared thematic as the connection regarding the theme or themes of something. There are many benefits if the literature story is delivered through an indirect learning approach that adopts the thematic literature approach. According to Greece Centre School District (2004), the benefits of the thematic approaches are:

- Students are able to explore the essential questions and achieve understandings, which will promote student-centered inquiry. This happens since thematic approach has provided for a conceptual framework for the implementation.

- Thematic approach is the interdisciplinary connections to the big ideas of other disciplines.

- Thematic approach will help to ensure that students are exploring a range of essential questions and learning via the common themes.

Thus, since thematic approach can benefits students in learning the literature, it also can be made more exciting if it employs the storytelling method. So, the process of delivering the thematic literature story in terms of storytelling can be called as thematic storytelling approach.

2.7 STORYTELLING COURSEWARE

This section reviews several prototype storytelling courseware that have been developed by several previous researches in this area. All of the prototypes have adopted storytelling approach but different educational theories in their courseware. Each of the prototype courseware is discussed briefly as follows.

(i)   A pedagogical approach to multimedia courseware development to motivate reading habit

Norhayati et al. (2001) conducted a study to inculcate life-long reading habits among children between 4 to 12 years old. A storytelling approach has been applied in their prototype courseware of Malay folktales. The design of the courseware was based on **2T SIGN** Principles; **T**hematic, **T**echnologies, **S**imulative, **I**nteractive, **G**aming, **N**avigation. Their study concerns a holistic child development via applying the cognitive affective and psychomotor concepts.

The design was created towards exploratory courseware in order to attract children to read, and to make them find that reading is interesting and fun. Children will experience the new genre, learn about the general knowledge, human problems, solutions and moral values, acquire new vocabulary, and able to explore the Malay language. The prototype courseware used Malaysian folktales as the major module, which includes famous Malay stories such as *Bawang Putih Bawang Merah, Sang Kelembai, Cincin Hikmah* and *Puteri Gunung Ledang.* The courseware also included modules of dictionary, games and self-creativity pages. Their aim was for children to gain erudition and reading skills in their own lingua franca language, and cultivate reading habits at the early age through their multimedia courseware.

(ii)   Storytelling Approach in Multimedia Courseware: An introduction to Sciences for preschool education

Another researcher, Zurina (2006) in her project has emerged with a multimedia courseware prototype aimed at introducing science to the preschool children. She has used the storytelling approach in the courseware development with ADDIE as the instructional design.

The prototype courseware includes three main modules namely adventure, option and game modules. The adventure module displays a seed that flies away from its own

origin, grows and becomes a tree with the help of water from rain, and light from the sun in the new place where it has landed. In the option module, users are given the option to choose the segment of adventure modules that they desire. While in the game module, users are allowed to create, reflect and work out their understandings of the whole story in the adventure module.

The project was based on Malaysian environment, and contained the basic science knowledge and religious values to attract preschool children in an interesting and interactive learning environment. The multimedia application used in the module is voice-text combination. The prototype uses CAI and CAL tools for preschool by compounding it in the CD-ROM.

(iii)   Edutainment animated folk tales software to motivate socio-cultural awareness

Nur Yuhanis and Nur Azan (2007) have developed software for the purpose of cultivating socio-cultural awareness among children and teenagers via edutainment animated folk tales concept. Their animation was based on 2D cartoon animation to display the folk tales story of "*Si Bangau yang Membalas Jasa*". The story started from the introduction of the characters. The scenes were exposed one by one until the climax and end of the story with voice narration to ensure delivery of the moral value in the story.

Supporting elements such as audios and graphics have also been incorporated in the software. Different audios are presented to show the mood of the scenes. The types of audio applied are the background music, dialogues, narrative and sound effects. The recorded and sound editing used the Cool Edit Pro Version 2.00 and the carton animation used the Macromedia Flash MX 2004.

(iv)   Interactive educational storytelling: The use of virtual characters to generate

teachable moments

The work by Leon et al. (2006) suggested the design guidelines for an interactive educational storytelling by using virtual characters to generate teachable moments. Their study used the Abraham Lincholn's crossword as the case study, and a prototype courseware has been produced. They aimed to add to the growing wealth of understanding about how characters in digital stories can both attract learners and deliver the learning goals.

Their framework was based on learning theory, cognitive psychology, studies on human-computer interaction and the narrative theory. Their study was focused on human-like value of virtual-mentor. The interactivity has been added to the stories to make the guidelines fully educational. Through the educator's learning objectives, their works highlighted the story genre, story events, and virtual character. The decision-making processes also have been externalized in their design to provide learners with the cognitive apprenticeship. They have adopted the five cognitive domain issued by Clark (1999): facts, concepts, processes, procedures and principles.

The instructional stories used virtual characters in two special ways; aligned protagonist goals and interactive agents as a tutor for learners. Each story in their case study offered teachable moments following the story line segment as depicted in Figure 2.4.

Following the Story Line

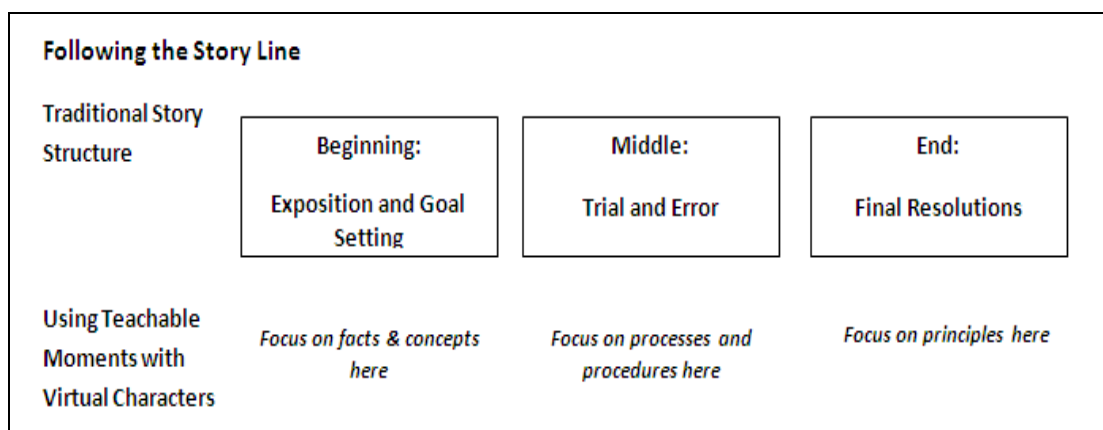| Traditional Story Structure	Beginning: Exposition and Goal Setting	Middle: Trial and Error	End: Final Resolutions
Using Teachable Moments with Virtual Characters	*Focus on facts & concepts here*	*Focus on processes and procedures here*	*Focus on principles here*

Figure 2.4: Teachable Moments Align Story Segment and Learning Objective

(v)   A multimedia storytelling website for foreign language learning

Tsou et al. (2006) have applied the storytelling manner to teach English in Taiwan. The website was developed since the EFL (English as Foreign Language) teachers in that country reported lacking of cultural and language abilities to handle the English storytelling, having little prior experiences with integrating storytelling in their teaching practices, and difficulty to identify an appropriate story.

The study was to investigate how web based technology can be used to address the problem of English learning difficulty. The comprehension, vocabulary and method to reorganize the sequence of events in the story have become the main focus in the development of the prototype courseware.

The website provides the opportunities for users to use the graphics, animations, sound effect and the music provided. Users can compose their own story easily by mastering mouse clicks and keystrokes in the module of Multimedia Story Composing. Recall process based on constructional theories has also been practiced by the users during their website composing. This recall technique has been used as a means of estimating the individual understanding. In the Story Replaying module, users have the chances to replay the complete story that each of them has composed.

The account administration module included in the courseware presented different levels of authorities and functions for user to login to the system. The levels were divided for students, teachers and system administrators only. Students can compose his or her

own stories, while teachers can view, evaluate, display and edit the stories composed by students, for later use in the classroom. The system administrators have the authority to remove user accounts and assign the authority levels.

The five related works that have been reviewed are summarized in Table 2.4.

Table 2.4: Comparison between Related Storytelling Courseware

Courseware	Approach	Cartoon	Educational Theory	Story	Subject	Users' Age
(i)	-Storytelling approach -2T SIGN	2D	-Cognitivism -Affective -Psychomotor	Malay folktales ("Bawang Putih Bawang Merah", "Sang Kelembai", "Cincin Hikmah", and "Puteri Gunung Ledang")	Malay Language	4-12 years old
(ii)	-Storytelling approach -interactive Multimedia -ADDIE Methodology	2D	-	The story of the Seed Growth	Sciences	5-6 years old
(iii)	-Storytelling approach	2D	-	Malay folktale ("Si Bangau yang Membalas Jasa")	Malay Language	Children and teenagers
(iv)	-Storytelling approach -Human computer interface (HCI)	2D	-Cognitivism psychology -Narrative story	Case study of Abraham Lincholn's Crossword	History	High School Students
(v) **web based**	-Storytelling approach	2D	Constructivist method	Current story composed by	English language	Children

	-Multimedia story			the Instructor	(EFL)	

Besides the prototype coursewares that have been developed for specific teaching purpose as discussed before, there are many popular storytelling courseware available in the market such as: "Just Grandma and Me" by Broderbund, from the adaptation of Mercer Mayer storybook. The courseware has 12 pages with animation, music, sound effect, narration and characters that speak. This courseware is aimed to teach children between 3 to 8 years old to read and tell the story. Almost all of the pages are interactive. For example, the images of tree, letter box, windows, word on the screen and so fourth can be linked and interacts with one another.

Next is "Beauty and the Beast" courseware that tells the love story of a young beautiful girl with an ugly man. This courseware is interactive. The illustration can be clicked to hear the music provided and the sound effect. The words in the courseware are also explained, and the whole story is told by a narrator (as narrative story). Another is 500 Nations and Magic School Bus.

2.8   CONCLUSION

The fundamental studies on multimedia, and its benefits, educational concepts of teaching and learning theories, teaching English as second language and the storytelling approach have been discussed in detail. Some works related to storytelling courseware that can be used as references for this study are also reviewed. All topics in this chapter will be used in the next study where the methodology development of the multimedia storytelling courseware will begin.