

# Computer-Assisted Instruction in Teaching Early Childhood Literature

CHEW FONG PENG

Department of Language & Literacy, Faculty of Education

TEH YING WAH

Department of Information Science, Faculty of Computer Science and Information Technology

ZAHARI ISHAK

Department of Psychology & Counseling, Faculty of Education  
University Malaya

Lembah Pantai, 50603, Kuala Lumpur.

MALAYSIA

Email: [fpchew@um.edu.my](mailto:fpchew@um.edu.my), [tehyw@um.edu.my](mailto:tehyw@um.edu.my), [irahaz@um.edu.my](mailto:irahaz@um.edu.my)

*Abstract:* - This paper focuses on how computer-assisted instruction may help in teaching early childhood literature. Other than that, it also discusses the problems of developing and publishing early childhood literature in Malaysia and the solution. A survey was carried out to find out whether computer aided instruction is one of the best methods to help teaching early childhood effectively. A selected Malay folk tale, its exercises and game will be discussed throughout the paper.

*Keywords:* Computer-Assisted Instruction, Early Childhood Literature, Educational Games.

## 1 Introduction

Traditional teaching in early childhood literature will never be the same with the use of the computer-assisted instruction (CAI) and the implementation of the new technologies. The definition of CAI is instruction or remediation presented on a computer [1]. One of the main factors of successful implementation of computer in education is to convert the instructions into computer programs which should allow users to have two-way communication (interactive). The instructions will be introduced by using animation, sound and educational games. One of advantages of using CAI is that students learn the subject at their own pace and we can achieve personalized learning, Adaptive Learning [20] as well as cost effective learning method [19].

In the traditional modality we measure the abilities (creativity, communication and collaboration) of children based on mastery of the spoken and written word. Nowadays, kids explore a multimedia environment such as TV, video, DVD, Internet and educational games; adults also explore a multimedia learning environment [16, 21] and games [18]. We should look at the new ways to measure our kids' creativity, communication and collaboration [17, 23] through educational games [2]. According to Jyhjong Lin [22], through the e-Learning process, the result of learning outcome of student is easily monitored and controlled as compared with the traditional learning.

## 2 Literature Review

According to Azizah Hamdan and Md Sidin Ahmad Ishak (2004) [3], during 1999, the content of nonfiction books which comprises education book, textbook, religion, dictionary and illustration book which is the most popular publishing in Malaysia, namely 82% of issues of total amount of children publication in that year was fiction and comic books. For that year, as many as 2,414 titles of children's publication produced comprised educational books. Data shows that book category comprises 77% issues of children publication in Malaysia; on the other hand, less children's literature has been produced.

Hadijah Rahmat (2006) [4] found that literary work in Malay language was fairly late in being produced and also late to grow. Although literary work growth for children already increased quickly, development of Malay literary work for children is more in quantity aspects compared to quality aspects. Malay children's literature also had not yet acted effectively as an achievement model or motivation towards high standard of excellence, whereas quality of children's literature will determine the children's level of reading and thought skills.

Faridah Shamsuddin (2003) [5] also found problems in children's publication owing to the lack of quality materials and difficulties in keeping to target audience requirements. Most writers send manuscripts following their views as adults and are unable to animate materials as needed by the target audience. In Malaysia, there is a lack of good writers in writing children's publications because they do not understand child psychology. As such, the authors seldom do research before writing, even though they are lacking in skill set as painters or illustrators capable of drawing for children's publications. Paintings in children's books are made based on what the adult perceives as beautiful, not what interests the child.

As such, all publishers should ensure children's books especially literary works produced are of high quality from the language aspect, story, paper, lesson, illustration and others value so that they are functional from the education aspect. This is important because child literature materials are the closest friend to children besides inculcating interest in lifelong reading among children.

Rio Sumarni Shariffudin et al. (2007) conducted studies to identify learning problems such as reading faced among preschool children. They developed a software for reading and evaluating effectiveness of students by using computers to learn through reading. This research uses the design system model which is based on ADDIE's lesson [6], namely combination between qualitative and quantitative research approach within one design by concentrating on the qualitative approach as a dominant paradigm. To collect information about reading problems in learning, researchers have collected data on mastery reading about children in 10 preschools in Johor Bahru, Malaysia.

Ten teachers were selected in this study to seek information on instruction method such as reading which are commonly used in lessons and learning. Apart from that, researchers also worked on several issues on teacher's perception on computer application in reading lesson and learning for preschool children. To evaluate learning effectiveness by using ICT in reading, a software was developed and quantitatively and qualitatively evaluated. In quantitative assessment achievement of children from one school will be involved in quasi experiment. Assessment on software like qualitative also carried out by using observation method through ScreenCam's software and checklist. Child interaction was observed during their learning in reading using the computer.

In keeping with rapid ICT development now, Malay literature material in early children should not be only published in printed form, but also in ICT form, whether VCD, DVD or website. This became the main purpose of this study that is aimed at establishing the early children's literature, especially Malay Literature in ICT form to inculcate the interest among Malaysian children. This is an important effort to ensure the Malay Literature, national literature will be learnt and loved by Malaysians since childhood. This study was conducted based on research and Piaget's Theory of children's psychology development.

### 3. Theoretical Framework

The constructivist view is that children created knowledge through interactions with the environments. Children are not passive receivers of knowledge; rather they actively worked at organizing their experience into more and more complex mental structures. A central component of Piaget's theory of learning and thinking involve the participant of the children and the knowledge is not merely transmitted verbally but must be constructed and reconstructed by the children. Piaget emphasized that for a child to know and construct knowledge of the world the child must act on the objects and it is this action that provides the knowledge and the process of learning [7].

The children must be active; and the child is not a vessel to be filled with facts. One important feature of Piaget's approaches concerns the child's readiness; children can not learn something until maturation gives them certain prerequisites [8]. The ability to learn for a child is always related to the stage of intellectual development. Children who are at a certain stage should not be taught the concept of a higher stage development level.

According to Piaget (1969) [9], the intellectual growth involves three fundamental concepts; assimilation, accommodation, and equilibrium. Assimilation is fitting information or experience into a schema or a new schema is created for it. The process of assimilation involves the incorporation of new event into preexisting cognitive structures while accommodation means existing structures change to accommodate the new information. In other words, accommodation is the processes of dealing with new events by either modifying an existing schema or creating a new one. Through the process of repeated assimilation and accommodation, the child eventually creates a mental structure and also forms a new schema.

Equilibrium is the balance achieved whenever the child's experience is fitted into the schema or a new schema. This balance is very short lived, as new experiences are constantly being encountered by the child. The process of equilibrium involves the child striking a balance between the child and the environment. Disequilibrium describes the mental state in which imbalance exists between assimilation and accommodation. Disequilibrium is motivating in that it drives the child to achieve equilibrium. Equilibrium is the process of moving from disequilibrium to equilibrium. Equilibrium allows the child to employ assimilation and accommodation as tools for achieving equilibrium [10]. There are many types of equilibrium between assimilation and accommodation that vary with the stage of the development and the problem that needs to be solved. To Piaget, the process of equilibrium is the major factor in explaining why some children advance more quickly in the development of logical intelligence than others [11].

The Preoperational stage, which spans ages 2 to 7, the most obvious change, represents an extraordinary increase in mental representation. At this stage, the child reveals signs of mental representation everywhere – in children's recreations of experiences in make-believe play, in

drawings and painting that cover the walls, and in their delight at story time. Especially impressive are strides in language [12].

According to Piaget's theory the second stage of cognitive development, in which the child is lacking in logical operation and the decisions made by them are based on their perception. The child now knows how to employ mental symbol to re-create or represent previous experiences. During this stage the child has not yet mastered the ability to complete mentally or manipulate these symbols.

Among the major developments during this stage is the ability to represent objects or events or to use symbolic functions. Between the ages 2 – 7, the child's mental abilities come to unfold fully as advances in language development and imagination. The child is now able to think and play in new ways. For example the four year old child may turn the cup and saucer into a spaceship.

Piaget also describe that the preoperational stage child's thinking as egocentric. Egocentric is the tendency of a child at this stage to assume that everyone views in this world is the same way they do and that they are the center of everything. Piaget does not relate the egocentrism as to with selfishness, but merely reflects on qualitative limitation in thinking. As the child goes older, egocentrism wanes. By age six, children exhibit less egocentrism than at age three [13].

Another important thought by the child at this stage is irreversible [14], which is appearance is everything. For example, one preschooler receives a glass of milk in a shallow, fat glass in shape while his friend gets the same amount of milk in a tall, thin glass in shape. He thinks that his friend gets more milk. Seeing the milk poured back into the glass will not convince him otherwise.

Another important feature of the preoperational child is animism -- the idea that inanimate objects

have conscious life and feeling. For instance, the child may say that the car is tired and needs a rest or the moon is sad and that's why it is dark at night. Artificialism is the notion that natural events or objects (e.g., the rain, sun, moon) are under the control of human beings or superhuman agents. A child might say that the moon is gone because someone or any superhuman agent takes it home for a while.

The preoperational stage of Piaget's theory not only showed the development of the children but included a set of mechanisms by which knowledge can be constructed into the mind to create mental representation. The CAI is designed and tries to fit the child's Malay literature development. Basically the thinking of a child such as egocentrism, irreversibility, animism and artificialism are among the important element to be seen in the CAI in teaching early childhood literature.

#### **4. Research Methodology**

This project is divided into 3 phases as shown in Figure 1.0.

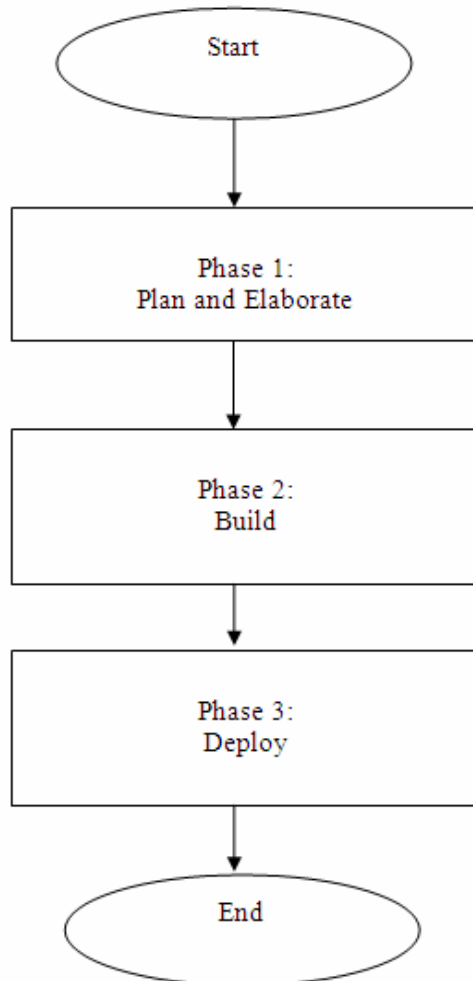


Figure 1.0: Flowchart of the research methodology

### **Phase 1: The activities of the Plan and Elaborate**

- A study of existing literature on Malay Folk Literature, Survey;
- Producing a draft plan of the project;
- Defining an initial model;
- Building some initial prototypes.

#### Deliverable:

A literature review on Malay Folk Literature, draft project plan, initial model and prototype are produced.

### **Phase 2: The activities of the Build phase (iterative and incremental)**

- Refine project plan;
- Requirement capture to define a model of Malay Folk Literature;
- Design/Drawing of stories, exercises, games;
- Programming on the flow of stories, exercises, games
- Testing, integration and evaluation of the whole system;

#### Deliverable:

Stories, Exercises, Games

### **Phase 3: Activities of the Deployment phase**

- Deliver user guide and help guide;
- Deploy the resulting software system;
- List any problems and enhancement;
- Review documentation;
- Training.

#### Deliverable:

User guide, software and documentation

## **5 Findings of Survey and Discussion**

Before we develop the stories, exercises and games in software form, the survey was conducted. A total of 941 respondents have been selected for the survey (347 university students from: University of Malaya, National University of Malaysia, Putrajaya University of Malaysia, Sultan Idris University of Education, Science University of Malaysia and University Malaysia

Sabah in Malay study, Education in Early Childhood and Education in Malay Study), 299 teachers in preschools and 295 parents. There are two parts in questionnaire. Part A is to elicit the background of respondents. Part B is to find out respondents' perception towards developing early childhood story on Malay Folk Literature of the narrative form.

In this study, we focused on teaching kids in learning Malay Folk Literature. There are two forms of Malay Folk Literature such as the narrative and non-narrative forms. The narrative form is also called folk stories or oral tales, comprising several types such as *lipurlara* tales or folklore, exemplary stories, animal fables, humorous stories, myths and legends. Meanwhile the major part of non-narrative material occur in verse; it includes folk sayings, folk songs, traditional lore, riddles, *pantuns* or rhymes, *gurindam* or couplets, and *seloka* or satirical poems and others. [15] This survey focuses on Folk Literature of the narrative form.

Table 1 show the findings of the survey regarding some traits of Malay literature in developing the children's learning materials.

Table 1: Feedback from respondents on the development of Malay Folk Literature (n= 941)

Items	Mean	Standard Deviation
1. Malay Folk tale is required to maintain original themes and stories	4.2253	0.8922
2. Malay literature is found more suitable than Western literature for early childhood	3.9639	1.0359
3. Type of published materials		
a. Video(DVD/VCD)	4.3709	0.0242
b. Book	4.2423	0.0270
c. Audio (CD)	4.1541	0.0283

4. Develop Computer-Assisted Instruction in teaching early childhood Literature for Kids (Useful)	4.1690	0.8544
5. ICT (CAI) materials which are suitable		
a. ICT interactive	4.1243	0.0273
b. Grafic in 3 dimension	4.0882	0.0277
c. Web page	3.9479	0.0320
6. Contents of ICT (CAI) materials		
a. Games	4.2752	0.0304
b. Interactive	4.2168	0.0258
c. Exercises	4.1041	0.0282
7. <b>Weightage of buying</b>		
a. Moral value	4.2593	0.0274
b. Quality	4.2434	0.0261
c. Variety of activities	4.2062	0.0260

Table 1 indicated that the respondents were positive towards the development of Malay Folk literature in ICT. They required that Malay folk tales need to maintain the original themes and stories (Mean 4.2253, *SD* 0.8922). Malay literature is found more suitable than Western literature for early childhood in Malaysia (Mean 3.9639, *SD* 1.0359).

Asking about the published materials of Malay folk literature, the respondents prefer the Video (DVD/VCD) type (Mean 4.3709, *SD* 0.0242). ICT interactive (Mean 4.1243, *SD* 0.0273) is the most suitable CAI material that found among the respondents, meanwhile games (Mean 4.2752, *SD* 0.0304), interactive (Mean 4.2168, *SD* 0.0258) and exercises (Mean 4.1041, *SD* 0.0282) are accepted as the contents of CAI materials.

From the perspective of respondents, the weightage of buying the CAI of Malay children folk tales are moral value (Mean 4.2593, *SD* 0.0274), quality (Mean 4.2434, *SD* 0.0261) and variety of activities (Mean 4.2062, *SD* 0.0260).

## 6. Development of Educational Games

Based on the above findings, we recognized the main traits of the children's reading materials given by the respondents, then we developed our computer-assisted instruction in teaching early childhood literature based on three parts such as story, exercise and game.

After watching the story, the children need to do some exercises to evaluate their understanding towards the story. Besides that, children also may play the games provided to test their psychomotor aspect.

### 6.1 Story

A Malay folk tale titled "Emergence of a Famous Country" is chosen as our computer-assisted instruction in teaching early childhood literature. "Emergence of a Famous Country" was a story on the background of establishment of the state of Malacca in the 15th century. It is suitable reading by the five year old child. This story is about a prince named Parameswara who was at a place where a wise and brave deer avoided being pounced upon by the prince's beagle. Prince Parameswara then named this state 'Malacca' in conjunction with the tree beneath which the incident happened.

This story was chosen because the story must be learnt by children to know about their own country to inculcate the spirit of nationalism among them. This story was also found to embrace positive values such as cooperation, bravery, patience and so forth, that are found suited to the children's development that need good story to form their quality personalities. Some of screen shots of the story are shown in Figure 2 and Figure 3.



**Figure 1:** Parameswara and his followers are tracing the footprints of the deer



**Figure 2:** The wise and brave deer avoids being pounced upon by the prince's beagle.

### 6.2 Exercises

Exercises consist of three parts, namely cognitive, mathematics and Malay language. There are 15 items of question in the exercises. Those who score 10 items correct or above are considered as having achieved the level of development stage proposed by Piaget (1965).

An example of cognitive exercise is shown as in Figure 3.



**Figure 3:** Arrange all pictures according to the chronological order of the story

An example of mathematic exercises is shown as in Figure 4.



**Figure 4:** Count and drag the correct answer in the box provided

An example of Malay Language exercises is shown in Figure 5.

**Figure 5:** Based on the picture, spell out the phonetics



### 6.3 Game

In this part, there are 18 puzzles of the above story to be arranged accordingly to make a complete picture. Figure 6 shows an example.





**Figure 6:** Rearrange the above puzzle to form a complete picture

The story, exercises and game are designed based on the research done that show how respondents are fond of the multi-dimension of the Malay literature teaching materials for early childhood. It is designed in software type for story, exercises and games, in line with the psychology of early childhood education proposed by Piaget (1965). He emphasized that the child must act on the objects and it is this action that provides the knowledge and the process of learning. Beside that, egocentrism, irreversible, animism and artificialism are four main characteristics of the preoperational stage of the children that need to be fulfilled to produce a creative, critical, and all-rounder leader then.

## 7. Conclusion

In the ICT era, computer assisted instruction is getting increasingly good response from society, especially in the early childhood education field. In this case, computer assisted instruction in teaching Malay children's folk tale was found to have advantages; the audio and visual effect was

not found in story books but in the software provided the children could enjoy interactivity and student centered short story, exercises and games. These features would be planting in children interest in reading and a lifelong love for local folk tales.

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