Potentiality of Designing and Developing Mobile A Comic Application As A Way Of Learning For Dyslexic Children

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Abstract: Dyslexic children have their own characteristics such as simple task, motivation oriented, and multi-sensory preference. Intervention for dyslexia is possible and some research has been done to help dyslexic children to learn better. Here, the researchers have done a preliminary research by looking at possibilities of implementing mobile comic application as a way of learning for dyslexic children. Interview, survey, and observation amongst teacher and students have been done at two schools for dyslexia students. The findings revealed that there is potentiality to design and develop the mobile comic application. Following this study, the researchers will investigate further on the comic style and the use of interactive multimedia elements as instruction.

Key-Words: - Mobile comic, Dyslexia, Interactive Comic, Mobile Application, Comic for Learning, Dyslexic children

1 Introduction

Dyslexia is a difficulty in the acquisition of fluent and accurate reading, spelling and writing a skill that is of neurological origin (Smythe, 2006). In his book, Smythe (2010) suggested that dyslexia is caused by lower efficiencies in some areas of cognitive processing needed for reading and writing compared to non-dyslexic individuals. Due to these specific cognitive difficulties, he suggested intervention using Information Technology. It would be very beneficial if such intervention is implemented in Malaysia, since the dyslexic population in Malaysia is substantial. There were about 314,000 school-going children with dyslexia reported in the year 2005 and none of the dyslexia schools had implemented Information Technology as the approach of teaching (Fadilahwati et al, 2010). Learning difficulties experienced by these children will contribute to later educational, social, psychological, health and employment disadvantages. For these children, the long term consequences of having experienced failure at school were very alarming. Some of possible intervention approaches are educational and technological approach, where the use of multimedia program is believed to be able to motivate them to learn.

Keates (2000) believed that ICT (Information Communication Technology) is an area where it is possible to support and facilitate dyslexic students. She reported that dyslexic students use ICT because it is an area where they generally have not previously failed. It is helpful, supportive, facilitating and motivating. In her research, Keates has proven that dyslexic children have skills in keyboading, handling mouse, and interacting with the screen. On the other hand, the use of multi-sensory learning was also confirmed by Spafford and Grosser (1996, p.17). They stated that for the student with dyslexia, repeated readings, retellings and so on would be needed to reinforce presented materials. They recommended that structured lesson activities be used that incorporate a multi-sensory interactive approach for the full benefit of enrichment for dyslexia students.

Many dyslexics have trouble paying attention, their mind tends to wander and they can’t focus on reading or other tasks for very long (Goldish, 2001). Using multimedia is believed to be able to motivate the dyslexic student to learn. Nor Hasbiah (2007) in her research reported that multimedia courseware has the capability to motivate dyslexic children. She also added that multimedia technology possesses the
ability to touch various sensory modalities of dyslexic children. Watson (n.d.) also confirmed the statement, and stated that multimedia negates the need for a dyslexic student to rely on the text alone and provides a multimodal means of relaying that information to the brain, placing control back in the hands of the student.

The use of interactive comic for learning is believed to be something new. The approach of reading content through comic by utilizing multimedia technology will hopefully be a new successful way in improving dyslexia motivation to learn. Cohn (2005) stated that interactive comic plays an important role as a social interactivity for a further visual language. He believed that interactive comic has a "modality holistic" method, where real-time narratives combine all three "modalities" in which language can manifest: spoken, gestured, and drawn. Spoken language is used for various communicative purposes, gestured language provides a wealth of information in addition to speech and drawn language, is the visual that support the two languages.

The researchers believe that comic provides visual instructions that can help dyslexic children to understand content better. Comic strips are designed using visual storyboarding techniques, drawing techniques and storytelling techniques to convey messages. Thus, a special designed comic may be attempted as an instruction to deliver content for dyslexic children. In Alleyne’s article (2009), Carol Tilley emphasized that comics are just as sophisticated as other forms of literature, and children benefit from reading them as much as they do from reading other types of books.

2 Problem Formulation

There are possibilities of helping the dyslexic children using multimedia programs. Through a developmental research of Interactive Multimedia Learning Object (also known as IMLO) for dyslexic children, Fadilahwati et al (2010) has found that learning with IMLO was motivating, fun, easy, and helps them to understand the topic better. Dyslexia students need to be encouraged to learn with something they like. Ronaldi et al (2011) in his research about animation in special instruction for dyslexic children has recommended that it is very important to consider the dyslexic children’s characteristics, topic problem identification and identify a learning strategy.

This study is aimed to look at the potentiality of designing and developing a mobile comic application as a way of learning for dyslexic children. The research questions are:

1. What are the teacher’s opinions about dyslexic children using mobile comic application?

2. Is mobile comic application motivating the dyslexic children to read and understand the content?

3. Do the dyslexic children show motivating behaviour while using mobile comic application?

To answer research question 1, an interview with an experienced teacher was approached.

To answer research question 2, Fun Questionnaire (Donker, 2005) was used as interview questions. The Fun Questionnaire consists of fourteen close ended questions that identifies whether the mobile comic application was motivating/not.

To answer research question 3, Fun Questionnaire was used again as observation checklist. The dyslexic children were observed while using the mobile application.

3 Problem Solution

3.1. Interview with the teacher

The researcher had found an experienced teacher from a dyslexia school; SK Bukit Cherakah (one of primary schools with dyslexia program in Malaysia). He has fifteen years of experience teaching dyslexic students and is actively involved in dyslexia workshops and seminars with the Ministry of Education. He was interviewed on 12th January 2012.

The teacher was explained about the concept of mobile comic application and feedbacks were obtained.

The interview with teacher has revealed some important points:

1. Dyslexic children need motivation while learning. They usually have short term attention span. Comics might help to overcome this problem since it provides
attractive images that could maintain their attention.

2. The best teaching strategies for the dyslexic children are using images and a story that relates to the children’s life. Such approaches can help the dyslexic children to form an understanding on the content. Comics can be a very good approach as teachers can tailor the visual based instructional strategies.

3. Multimedia application is the area where dyslexic children never fail. They are very good at using it. Mobile comic application can make them feel personalized, motivated, and is fun.

It was believed that mobile comic application might be motivating and helping dyslexic children in learning the content. School syllabus may be specially designed with instruction based on comic advantages. According to Shedroff (1994), data can be transformed to become wisdom through certain steps. In his Unified Field Theory of Design, Shedroff (Figure 1) stated that knowledge is done through Interaction Design and the creation of experiences. The theory further explains stages how data can be transformed to become information (stage1), information to become knowledge (stage 2) and knowledge to become wisdom (stage3). It requires successful implementation at every stage to get meaningful wisdom. The researchers suggest further investigation in applying this theory in creating the instructional strategy using comic style.

3.2. Interview with the students
Seven dyslexic students, age 9 to 10 years old from SK TTDI 2 (Dyslexia Pilot School in Malaysia) participated in the event. They were interviewed and observed on 2nd March 2012.

The dyslexic children were introduced to a mobile comic application which was downloaded from android market, namely: Annual Haircut Day. The application showed some comic style features such as visual storyboarding techniques; where illustrations are made with certain composition techniques, framing techniques (Figure 2) in a storyline to convey certain messages. Story characters were established and text was also placed explaining some important points. To use the application, the dyslexic children need to tab the application icon, select the menu, and read the story by navigating the next and back button.

![Figure 1: Unified Field Theory of Design describes the way to transform data into information. Information then can be consumed via experiences that generate knowledge. Experiences can then eventually generate wisdom.](image)

![Figure 2: Illustration on the left side shows the composition of situation where the main character is influenced by the other four characters. The illustration on the right side shows the framing technique, where the jumping tiger is viewed from the bottom view and the diagonal lines represented the dynamic actions.](image)

The dyslexic children were asked to open, use the application individually, and re-tell the story in detail. They were interviewed using Fun Questionnaire. Some important feedbacks are:

1. 85.7% like to read comic such as Ben 10, Cars, Boboiboy, Doraemon and Upin & Ipin. They also admitted that they like comic that has lots of actions.
2. All seven students were motivated to use mobile comic application.
3. 71.4% have used tablet before. They are iPad and Galaxy Tab. (Fig.2)
4. 85.7% also confessed that they wished to have such mobile comic application for their school subjects such as Bahasa Malaysia, English, Math and Science (Fig. 3).

![Fig.3: Majority dyslexic students wished to have such mobile comic application for their school subjects.](image)

4. Few students were looking impatient in finishing the story. They looked at the comic strip and were trying to find ways to complete the story by clicking around the screen.

5. All seven dyslexic children were very interested with elements that trigger their senses such as hearing the sound effects and attractive visuals (see Figure 5).

6. All seven dyslexic children were also found spending time in observing the illustration and reading the text at the same time.

7. All seven dyslexic children understood the story and able to tell the story back using details such as situations, words used by the voice over as well as recalling the statement written on the screen.

![Fig.5: Dyslexic child was looking interested with the mobile comic application. His body gesture showed that he was paying attention to it.](image)

3.3. Observation

While using the application, the dyslexic children were observed on their behaviour based on Fun Questionnaire questions. The moment was videotaped, played back and reviewed by a second observer. The finding confirmed the previous interview results.

While the video observation has resulted in these data:

1. The whole experience from opening, using and closing the mobile comic application has been observed. It can be stated that the dyslexic children can use mobile comic application.

2. It was found that the mobile comic content was too long (5 minutes). The dyslexic children might have short term attention span as they approximately retain their attention up to two minutes only.

3. Some of students were noticed confused with the navigation. They might need more obvious visual to indicate the navigation button.

The task that required them to open, use, read and understand the content seemed to be motivating them. Similar concept is applied in Cognitive Evaluation Theory (CET), where intrinsic motivation happens because of external consequences. The basic premise of CET is that if children feel they have some control over activities, have a sense of relatedness to the activity, and feel good about themselves when they participate, they will be intrinsically motivated to participate (Deci & Ryan, 1985). Mandigo (1999) explained four main propositions in CET;
• Preposition 1 was described as the moment when individuals participate in an activity in which they feel they have some choice and control over the process to reach personal goals, intrinsic motivation will be enhanced. Using mobile comic application, dyslexic students can be intrinsically motivated to experience the story with their own control. In this case, the mobile comic application might need to provide relevant story and certain visualization techniques (such as composition and framing) that give influence on the intrinsic motivation.

• Proposition 2 was described in a situation when that intrinsic motivation is enhanced by feelings of competence and optimal challenge. When the dyslexic students read the story more, they can be challenged to understand the story more.

• Proposition 3 was described as the functional significance of extrinsic and intrinsic factors which can be viewed along a continuum as to their impact on intrinsic motivation. When the dyslexic students are attached to the story, they can remain motivated and get used to the content materials.

• Proposition 4 was described as that individuals’ motivational states towards the activity influence their intrinsic motivation. With the 3 prepositions achieved, the dyslexic students can be instructed to participate in activities such as test/assessment. These benefits can help the dyslexic children to overcome their difficulties in learning.

Based on the student interview, the dyslexic children were found motivated using the mobile comic application. Comic style features such as composition and framing techniques, story characters and text helped.

Based on the observation, the experience of dyslexic children using mobile comic application was found motivating. Dyslexic children also need to be motivated consistently to retain their attention span.

The researcher believes that using a mobile interactive comic could have its own benefit for dyslexic students as it is personal. Pesonen (2001) reported that Interactive comic is a technology-based learning environment that provides an opportunity for personal differentiation in the learning material. The personal feedback which is offered to the learners in the interactive comics motivates and guides their learning processes.

Following to this study, the researchers will design and develop a mobile comic application for the dyslexic children. Further investigation need to be done in identifying specific comic style and multimedia elements to be used on the special instruction.

4 Conclusion

There was potentiality to implement mobile comic application for dyslexic children.

Based on the literature review, there were possibilities of implementing two theories to design and develop the mobile comic application: (1) Unified Field Theory of Design, to design the content by transforming data to become wisdom, and (2) Cognitive Evaluation Theory (CET), to develop the mobile application comic with special instruction.

Based on the teacher’s opinions, mobile comic application can be a good approach to teach dyslexic children as it provides tailored visuals, story that relates to their life and multisensory engagement. These benefits can help the dyslexic children to overcome their difficulties in learning.

References:


