APPLICATION OF PERSUASIVE MULTIMEDIA TO RAISE CHILDREN'S AWARENESS OF CHILD SEXUAL ABUSE AMONG PRIMARY SCHOOL STUDENTS

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Abstract

Children are easily exposed to various types of abuse. It is because they have limited knowledge on personal safety. In addition, they do not realize that it is unethical for an adult to abuse their body. Consequently, they should be educated on such abuse. Accordingly, this study devises and develops a persuasive multimedia learning application (PMLA). It incorporates persuasive and multimedia principles in educating children with basic knowledge of child sexual abuse (CSA). With the principles, PMLA demonstrates (to children) the steps to avoid dangerous situations in order to increase their awareness of CSA. Quasi experiment using pre-test and post-test were carried out to assess children's awareness level, in which data were collected using Knowledge and Awareness Survey (KAS). A total of 222 primary school students' aged between 7 and 9 years old were randomly selected to participate in the study. Two moderating variables, which are school location (urban/rural) and gender involve in this study. In the end, results of ANCOVA test show that there is no significant difference in student's awareness between school locations and genders. Additionally, results also indicate that students from both locations and genders demonstrate an increment in the mean for the post-test. However, it was found that girls are more responsive in both tests than the boys.

Keywords: Awareness, persuasive multimedia, child sexual abuse.

1 BACKGROUND OF THE STUDY

In the USA, CSA has been detected as early as in the 1960's as a result of medical finding of the non-accidental injuries. Such cases have been published in medical journals and they have identified the sequence of developments from the battered baby syndrome (Child Welfare Information Gateway, 2011). Meanwhile in Malaysia, the CSA has been accepted by the public as a social problem since 1990, as a consequence of the death of a child who was physically and sexually abused (Utusan online, 2010). CSA is a form of child abuse, in which an adult abuses a child for sexual stimulation. It could refer to inappropriately exposing or subjecting a child to sexual contact, activity, or behavior (Prevent Child Abuse America, 2005).It also can be defined as the exploitation of a child or adolescent for the sexual gratification of another person. Additionally, Collin-Vezina (2013, p. 1) refers CSA to any sexual activity perpetrated against a minor by treat, force, intimidation, or manipulation. It affects most children negatively at least in the short term (Finkelhor& Berliner, 1995 as cited by Coohey, 2010).

According to a preliminary investigation by Azliza and Wan Ahmad Jaafar (2012, p. 246), the Social Welfare Department reported that the increase in public awareness also contributes to the increase of child abuse statistics in Malaysia. Since then, various efforts have been carried out in creating public awareness in preventing CSA. However such cases keep happening and increasing every year. Thus, it urges that continuous prevention programs should be organized. Consequently, a number of efforts have been planned and implemented by government agencies, NGOs, and other organizations in Malaysia. Among the programs include media advertisement, awareness week, campaigns, forums, and talks.

Most of the prevention programs stress on public awareness, leaving only limited studies and prevention programs on educating children about preventing the CSA. In fact, in primary schools, personal safety is taught in general approach as part of Physical and Health Education subject for Year 1, Year 2, and Year 3. Not only that, the ways of delivery are subjected to teachers' creativity (Azliza & Wan Ahmad Jaafar, 2012, 246).

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Based on the scenario in the previous paragraphs, CSA prevention program in Malaysia is generally still lacking. Much work has been carried out to protect children from further maltreatment but prevention is more cost-effective in terms of resources and outcome (Cheah & Choo, 2011, p. 12). This study believes that the success of CSA prevention strategies depends largely on cooperation from government, NGOs, and the public to ensure that the number of CSA cases can be effectively reduced.

2 PROBLEM STATEMENTS

CSA is not a new issue in most countries throughout the world. Having appropriate knowledge about CSA is an important aspect in constructing public awareness regarding the current CSA. It is important to provide clear information about CSA to the public, especially to children so that they are aware of this phenomenon. It is important to emphasis on, because Hitrec (2011, p.165) found that children have limited knowledge about danger and self-protection. Besides, UNICEF Malaysia (2009) also found that children are normally not aware that it is wrong for an adult to abuse them.

CSA occurs at every socio-economic level, across ethnic and cultural lines, within all religions and at all levels of education (Renk, Liljequist, Steinberg, Bosco, & Phares, 2002). Singh, Ying, and Nurani (1996, p. 487) discovered that about 38.1 percent of the CSA reports involved children aged 10 or younger when they were sexually abused. It impacts children negatively, during their childhood and future adulthood in physical, emotional, and psychological context (Noor Maizura & Salwana, 2010, p. 625). As an example, Bornstein (2007) found that the victims of the CSA face great trauma in their life compared to other types of abuse.

Although it implicates negatively, prevention programs seem limited and ineffective because CSA cases keep increasing every year. Attention and care should be handled seriously. Effective methods and appropriate approaches need to be implemented effectively to protect the children. Thus, this study aims at two fold objectives: (1) to design and develop PMLA that could provide knowledge and increase children's awareness of CSA and (2) to study the effect of PMLA in raising children's awareness of CSA.

3 MULTIMEDIA LEARNING THEORY

Cognitive Theory of Multimedia Learning (CTML) proposed by Mayer (2001, p.44) has been an appropriate theory to pursue in this study. This theory represents the human information processing system. It describes on how people learn from words and pictures. Mayer explains how information is process through two basic channels which are verbal and visual. Pictures and words come in from the outside world as a multimedia representation and enter to the sensory memory through the eyes and ears. Sensory memory lets for pictures and printed text to be held as exact visual images for a very brief period in a visual sensory memory and for spoken words and other sounds to be held as exact auditory images for a very brief period in auditory sensory memory. The central work of multimedia learning happens in working memory which is used for temporary holding and manipulating knowledge in active consciousness.

Three major cognitive processing steps of active learning are required for multimedia learning. The processes consist of selecting relevant material, organizing selected material, and integrating selected material. Selection of relevant materials arises when a learner pays attention to appropriate words and images in the presented materials. Then, organizing selected materials engages building structural relations among the elements. Finally, integrating selected materials with existing knowledge involves building-up connections between incoming material and relevant portions of prior knowledge from the long-term memory.

4 PERSUASIVE TECHNOLOGY

Currently, persuasive technology approach has been widely applied in designing and developing applications with the intention to change a particular aspect of human behavior in a predefined way. It focuses on the combination of computers and the persuasion into an assistive tool. According to Fogg (2003), persuasive technology refers to interactive computing systems, which are designed with the aim to change people's attitudes and behaviors through persuasion (Canaday, 2004). Education is among the important current targets for persuasive technology (Ijsselsteijn, Kort, Midden, Eggen, & Hoven, 2006). Fogg (2003, p. 5) through the term captology describes how persuasive computers are designed to change ones attitudes and behaviors. He defined captology as design, research, and analysis of interactive computing product intentionally designed for the purpose of changing people's attitude or behaviors. This new area of study explores the overlapping functions of persuasion (increasing awareness, influence, motivation, behavior change, etc) and computing technologies. Thus, this study adopts the principles of persuasive

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technology (namely similarity, suggestion, attractiveness, and simulation) and sets the computer as a medium in raising children's awareness of CSA.

Physical attractiveness has a significant impact on social influence. The principle of *attractiveness* suggests that a computer technology that is visually attractive to target users is likely to be more persuasive as well. Research confirms that it is easy to like, believe, and follow attractive people (Chaiken, 1979).Therefore, in designing the PMLA which involves children as the target users, this study believes that children are easily attracted to attractive appearance. Thus, the principle of attractiveness is relevant in this study.

In addition, the area of psychological cues, one of the most powerful persuasion principles is *similarity*. Similarity explains that in most situations, we can easily be motivated and persuaded by people who we think are similar to us in terms of personality, preferences, or in other attributes. According to Fogg's principle of similarity, people are more readily persuaded by computing technology products that are similar to themselves in some ways. Therefore, in designing the PMLA, similarity principle has been applied through the use of metaphor that children feel similar with their everyday situations. Besides, the narration in the PMLA utilizes children voice.

Fogg (2003, p. 41) also explains that a computing technology will have greater persuasive power if it offers *suggestions* at opportune moments. This principle is one of the persuasive tools known as suggestion technology. The principle of suggestion is significant in order to guide children to act appropriately when facing any dangerous situation. If the children have the knowledge and they already practice the suggestion guideline, they are expected to be clear about appropriate actions based on the suggestions provided if something bad happens to them.

Besides, Fogg (2003, p. 61) adds that portable simulation technologies designed for use in everyday routines can highlight the impact of certain behaviors and further motivates the behavior or attitude change. Regarding that, computer simulations can create experience that imitates real experiences. Simulation category that is relevant to design PMLA in this study is based on the principles of *simulation in real-world contexts*. In this application, children are provided with several samples of experiences in the real situation. These will help children understand the concepts they have to learn and guide them in making decisions in their real life.

5 THEORETICAL FRAMEWORK

To ensure this study is systematically conducted, the theoretical framework for this study is designed based on a macro and micro design strategies (Reigeluth & Merril, 1978). According to Reigeluth and Merrill (1978), macro strategy concerns with the selection, sequence, and organization of the subject matter topics that are to be presented. On the other hand, micro strategy concerns with the strategies for effective presentation of the learning contents. The macro strategy shows the utilization of persuasive technology principles for the development of overall application, whereas the micro strategies adopted in this study incorporate Mayer's Cognitive Theory of Multimedia Learning (2001, p. 44) and Mayer Design Principle (Mayer, 2009, p. 242) in the interface design. The combination of both generates an environment of persuasive multimedia that applies a variety of attractive elements and interactivity (Azliza & Wan Ahmad Jaafar, 2014, 135).

6 RESEARCH HYPOTHESIS

This study hypothesizes the following:

H_{01} *By controlling the pre-test score factor, there is no significant difference in awareness score between the children from rural and urban schools in PMLA.*

H_{02} *By controlling the pre-test score factor, there is no significant difference in awareness score between the genders in PMLA.*

7 RESEARCH DESIGN AND METHODOLOGY

This study aims to design and develop PMLA with the intention to provide knowledge and help in increasing children's awareness of CSA. Therefore, this section discuss on the research design, sample, materials, data collection method, and data analysis.

A total of 222 children off our primary schools involves in this study. Two schools are located in urban areas and two schools are in rural areas. PMLA involved systematic works at planning, design, and development (ISD model by Alessi and Trollip (2011, p. 409)) stages. Four principles derived from

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persuasive technology namely attractiveness, similarity, suggestion, and simulation are incorporated in PMLA. In addition, as a learning strategy, the presentation of PMLA was decided to incorporate personalization principle. It is one of the principles in multimedia design principles by Mayer (2009). It describes that users learn better from multimedia lessons when words are in conversational style rather than formal style.

Quasi-experiment using pre-test and post-test was performed to assess children's awareness level of CSA. Data were gathered using the KAS, before and after they use the PMLA. The KAS consists of 10 questions to assess awareness using 5-point scales: 1 (Really Not Aware/*Sangat Tidak Sedar*), 2 (Not Aware/*Tidak Sedar*), 3 (Not Sure/*Tidak Pasti*), 4 (Aware/*Sedar*) and 5 (Really Aware/*Sangat Sedar*).

This study was carried out in three phase. At the beginning, the students were scheduled to sit for the pre-test in the first week. Then, they were briefed on the interface and navigation in the PMLA. After that, they were allowed to explore the PMLA by themselves. Immediately after the treatment, the students were given the post-test questions.

8 DATA ANALYSIS

8.1 Hypothesis 1

By controlling the pre-test score factor, there is no significant difference in awareness score between the children from rural and urban schools in PMLA.

The purpose of this analysis is to measure the significant effects of PMLA in increasing children's awareness of CSA in urban and rural areas by comparing the mean values of post-test and pre-test results as the covariance for both children's locations of school using Analysis of Covariance (ANCOVA). The result is needed to prove that children's awareness level of CSA between urban and rural are at certain level of differences so that the effectiveness of PMLA treatment can be correctly justified. It is seen in Table 1 that the mean for pre-test scores for urban area is 37.82 and the mean for post-test scores is 42.23. While for rural area the mean for pre-test scores is 37.63 and the mean for post-test scores is 42.59. The mean scores show that children's awareness score were increased for both locations.

Table 1: Descriptive Statistic Awareness by Children's Locations of School

Location		N	Mean	Std. Deviation
Urban	PreAwareness	106	37.82	4.798
	PostAwareness	106	42.23	5.155
	Valid N (listwise)	106		
Rural	PreAwareness	116	37.63	4.369
	PostAwareness	116	42.59	3.925
	Valid N (listwise)	116		

Referring to Table 2, after adjusting for pre-test scores, there was no significant difference between the schools in both locations on post-test on the awareness, $F(1, 219)=0.29$. There was a strong relationship between the pre-test and post-test scores on the awareness, as indicated by a partial eta squared value of 0.428. This mean that model explain 42.8% of the variance in the overall score. Hence, the Hypothesis 1 is fail to reject.

Table 2: Analysis of Covariance (ANCOVA) on Awareness by Children's Locations of School.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1958.515[a]	2	979.257	82.120	0.000	0.429
Intercept	1020.743	1	1020.743	85.599	0.000	0.281
Pre-test	1950.997	1	1950.997	163.609	0.000	0.428
Location	13.452	1	13.452	1.128	0.289	0.005
Error	2611.526	219	11.925			
Total	404029.000	222				
Corrected Total	4570.041	221				

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Further, the pairwise comparisons on the mean difference (Table 3) show that there is no significant difference between schools in urban and rural areas at 0.289. This result confirms the previous ANCOVA result that there is no significant difference on awareness between children in schools in urban and rural areas.

Table 3: Pairwise Comparisons on Mean Difference of post-test result by Children's Locations of School.

(I) Location		Mean Difference	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Urban		-0.493	0.464	0.289	-10.408	0.422
Rural		0.493	0.464	0.289	-0.422	1.408

8.2 Hypothesis 2

By controlling the pre-test score factor, there is no significant difference in awareness score between the genders in PMLA.

ANCOVA was conducted to compare the effectiveness of PMLA in increasing children's awareness of CSA by comparing the mean values of post-test and pre-test results as the covariance for both children's genders. Table 4 reveals that the mean for pre-test scores for boy is 36.98 and the mean for post-test scores is 41.86. While for girl the mean for pre-test scores is 38.40 and the mean for post-test scores is 42.93. The mean scores show an increasing of awareness score for both after using the PMLA.

Table 4: Descriptive Statistic on Awareness by Gender

Gender		N	Mean	Std. Deviation
boy	PreAwareness	106	36.98	3.954
	PostAwareness	106	41.86	4.250
	Valid N (listwise)	106		
girl	PreAwareness	116	38.40	4.988
	PostAwareness	116	42.93	4.763
	Valid N (listwise)	116		

After adjusting for pre-test scores, there was no significant difference between genders on post-test on the awareness on CSA, *F(1, 219)=0.74* (Table 5). Also, there is a strong relationship between the pre-test and post-test scores on the awareness of CSA, as indicated by a partial eta squared value of 0.418. This mean that model explain 41.8% of the variance in the overall score. Hence, the Hypothesis 2 is fail to reject.

Table 5: Analysis of Covariance (ANCOVA) on Awareness by Genders.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1946.403[a]	2	973.201	81.235	0.000	0.426
Intercept	1015.828	1	1015.828	84.793	0.000	0.279
PreAwareness	1882.688	1	1882.688	157.151	0.000	0.418
Gender	1.339	1	1.339	0.112	0.738	0.001
Error	2623.638	219	11.980			
Total	404029.000	222				
Corrected Total	4570.041	221				

Further, the pairwise comparisons on the mean difference (Table 6) show that significant between genders at 0.738. This result confirms the previous ANCOVA result that there is no significant difference on awareness between genders.

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Table 6: Pairwise Comparisons on Mean Difference of post-test result by Genders

(I) Gender		Mean Difference	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
boy		-0.157	0.471	0.738	-10.085	0.770
girl		0.157	0.471	0.738	-0.770	1.085

9 DISCUSSION

9.1 Awareness of CSA between the children from rural and urban area.

ANCOVA result shows that awareness of CSA between children from rural and urban area of school at *F(1, 219)=0.29* which mean that there is no significant difference on children's awareness of CSA in urban and rural areas of schools. It explains that children in both urban and rural areas have the same level of awareness on CSA issue. Since the children participating in this study were selected from public primary schools (under the Malaysian Ministry of Education) that share identical syllabus, there is a probability that their awareness of CSA are at the same level. In addition, the increasing in mean scores for both areas means that children are more aware of CSA after they used PMLA.

This research finding is parallel to Pervin (2000, p. 21) study which confirms that there was no significant difference in awareness level among both rural and urban samples. The purpose of Pervin study was to ascertain whether level of knowledge and awareness had increase after the campaign interventions among in both rural and urban area in Kenya. The findings of this study clearly demonstrate that the awareness level of CSA has been spread among children in both urban and rural area.

9.2 Awareness of CSA between boy and girl children

Referring to the mean score for pre-test and post-test of awareness of CSA between gender, it can be seen that mean for post-test is increase for both gender. This means that children's awareness level increases with a mean difference of 4.88 for boy and 4.53 for girl. Both genders result prove that they are more aware of CSA after demonstrated the PMLA. However, girls obtain higher score than boys for both tests. Further, ANCOVA result shows that children's awareness of CSA between genders at *F(1, 219)=0.74* which mean that there is no significant difference on children's awareness on CSA between boy and girl. Both boy and girl have the same level of awareness on CSA issue.

Downer (1984) findings parallel with this study which found that there was no significant difference on gender in their evaluation of prevention program of CSA. Even sexual abuse majority happen to girls, however both genders show their awareness of this issue. Wurtele and Owens (1997) concluded that appropriate CSA prevention programs can benefit young children regardless age and gender.

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