Jurnal Teknologi

Full Paper

INTEGRATION OF PERSUASIVE MULTIMEDIA IN DESIGNING LEARNING APPLICATION FOR CHILD SEXUAL ABUSE

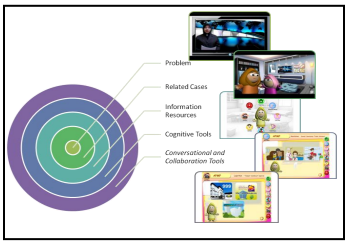
Azliza Othman[a*], Wan Ahmad Jaafar Wan Yahaya[b], Balakrisnan Muniandy[b]

[a]Universiti Utara Malaysia, Sintok, Kedah, Malaysia
[b]Universiti Sains Malaysia, Pulau Pinang, Malaysia

Article history
Received
30 July 2015
Received in revised form
13 September 2015
Accepted
11 October 2015

*Corresponding author
azliza@uum.edu.my

Graphical abstract



Abstract

This paper focuses on the design of learning application with the purpose to provide knowledge on child sexual abuse (CSA) to children ages 7 to 9 years old. Currently, children are not aware of prohibited adult touches to their body due to lack of knowledge on CSA. Moreover, information on how to avoid potential of CSA and self protection is still lacking. In such situation, they need to be educated and made aware of the danger of sexual abuse. In providing a better learning aid, this study incorporates multimedia learning and persuasive technology in developing a learning application named Persuasive Multimedia Learning Application (PMLA). Additionally, this study also adopts the components in constructivist learning environment (CLE) for the organization of the contents in designing PMLA. Then, perceived motivation test was conducted to assess children's learning experience after using the application. The results show that the integration of multimedia and persuasive technology has potential in motivating children in using the application and facilitating them for better understanding on CSA.

Keywords: Multimedia, persuasive technology, child sexual abuse

Abstrak

Kajian ini menumpukan kepada reka bentuk aplikasi pembejaran dengan tujuan untuk member I pengetahuan tentang penderaan seksual kanak-kanak (CSA) kepada kanak-kanak berumur 7 hingga 9 tahun. Pada masa ini, kanak-kanak tidak sedar tentang laragan sentuhan bagi orang dewasa terhadap diri mereka kerana kurangnya pengetahuan tentang CSA.Selain itu, maklumat mengenai bagaimana untuk mengelak daripada potensi CSA dan keselamatan diri masih kurang. Dengan ini, kanak-kanak perlu dididik dan diberi kesedaran tentang bahaya penderaan seksual. Untuk memberi bantuan pembelajaran yang lebih baik, kajian ini menggabungkan pembelajaran multimedia dan teknologi pemujukan dalam membangunkan aplikasi pembelajaran yang dinamakan Aplikasi Pembelajaran Multimedia Pemujukan (PMLA). Di samping itu, kajian ini juga menggunakan komponen-komponen dalam persekitaran pembelajaran konstruktivis (CLE) untuk penyusunan kandungan dalam mereka bentuk PMLA. Kemudian, ujian persepsi motivasi dilaksanakan untuk menilai pengalaman pembejalaran kanak-kanak selepasmenggunakan aplikasi ini. Keputusan kajian menunjukkan bahawa integrasi multimedia dan teknologi pemujukan berpotensi dalam memotivasi kanak-kanak untuk menggunakan aplikasi ini dan membantu lebih memahami tentang CSA.

Kata kunci: Multimedia, teknologi pemujikan, penderaan seksual kanak-kanak

1.0 INTRODUCTION

Child sexual abuse (CSA) is a serious world social problem that requires an effective prevention strategy. [1] stated that children by nature are particularly at risk to all types of abuse because of their lack of knowledge on danger and self-protection. So, children are usually not aware of adults' abuse on them. In the high prevalence of CSA and the negative effects associated with this abusive experience, it stands to reason that research interest must turn towards the prevention of CSA. According to [2], the most successful way in preventing CSA is through education. In addition, computer technology recently plays an important role in education system. As a response to that, instructional materials are developed based on the stream of these recent technologies. This enables teachers to utilize different teaching methods and modes to accelerate student learning in their teaching practices. Therefore, appropriate learning applications should be designed in providing appropriate information about CSA to children.

The computer-based applications successfully utilize multimedia elements such as video and animation to facilitate explanation on complex concepts. Multimedia has also has been successfully utilized in learning environment for various educational applications and it has brought various advantages especially in improving children's learning process [3-6]. [6], found that multimedia can engage the human sense to inform, persuade, and entertain. Currently, the efforts have ventured into technology evolution to support the changes in a particular aspect of human behavior in predefined way. Briefly, persuasive technology refers to interactive computer system, which is deliberately designed to change people's attitude and behaviors [7].

The integration of multimedia elements into computer-based application is becoming a potential teaching and learning approach in classroom. This opportunity could be applied to benefit children in educating them about self-protection and how to avoid from potential sexual abuse. This study is, therefore, aimed at evaluating the effectiveness of the integration of multimedia learning and persuasive technology in learning application with the intention to assess children's motivation after using the application.

2.0 LITERATURE REVIEW

Literature analysis focuses on three specific aspects which are persuasive technology, multimedia learning, and related works on persuasive multimedia applications.

2.1 Persuasive Technology

Recently, technology has been proven to be effective to persuade users to change their attitudes and behaviour. [7] introduces the term Captology to define how persuasive computers are designed to alter attitudes or behaviors. [7] defines Captology as design, research and analysis of interactive computing product for the purpose of changing people's attitude or behavior. This new area of study explores the overlapping functions of persuasion (increasing awareness, influence, motivation, behavior change, etc.) and computing technologies (Figure 1). Persuasive technology focuses on the combination of computers and the persuasion into an assistive tool. According to [7], persuasive technology refers to interactive computing systems, which are designed with the aim to change people's attitudes and behaviors.

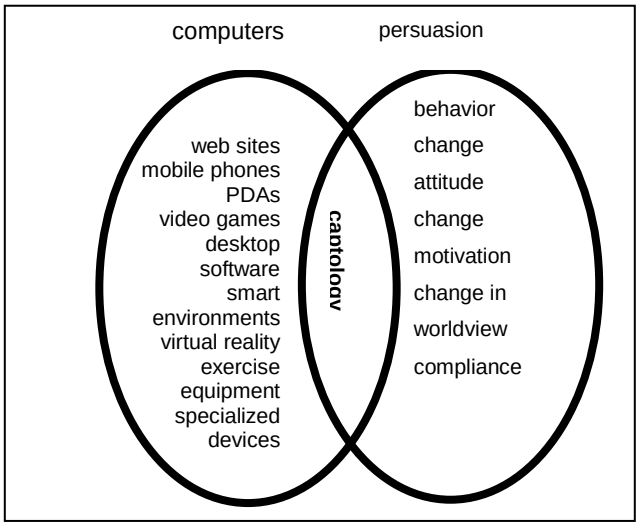


Figure 1 Area of Captology in Persuasive Technology (Fogg, 2003)

2.2 Multimedia

[8] defines multimedia as presentation of content that relies on both words and pictures. By words, the content is presented in verbal form such as using printed or spoken text, while by pictures, the materials are presented in pictorial form such as using static graphic (illustrations, graphs, photos or maps) or using dynamic graphics (animation or video). Moreover, multimedia also attempts to motivate and engage the student to the end of lesson [9]. Additionally, [10] stated that interactive multimedia learning takes less time, is more enjoyable and increases learning. [4] also claimed that multimedia application has conveyed a great support to individual learning in the sense that it allows the student to access different kinds of information at the same time (eg. words, pictures) at their own pace. Not only that, [11] added that multimedia potentially

extends the amount and types of information available to learners.

2.3 Related Work

Several studies have investigated the effects of persuasive multimedia application on user's motivation. According to McCracken and Wolfe (2004), multimedia can engage the human sense to inform, persuade, and entertain. Consequently, multimedia and education have evolved into new possibility. For example, [12] formulated the ways to reduce dental anxiety among children using persuasive principles in designing Persuasive Multimedia Learning Environment (PMLE). The PMLE create situations that motivate them to achieve a target behavior. The study discovered that most children's dental anxiety feeling dimension have been reduced by PMLE. Additionally, it is found that there is no significant difference in children dental anxiety scores between gender and age.

In order to raise stress awareness among the students of secondary schools, persuasive multimedia application derived from the persuasive technology and multimedia principle was designed and developed by [13]. This study exposes the implications and mitigation of stress in order to enhance the stress awareness among students. Results revealed that male students are more responsive to the persuasive multimedia than female students.

Another study by [14] developed a persuasive multimedia application aimed at forming a positive attitude towards disabled person in their efforts to minimize the rate of disabled parking abuse. The persuasive multimedia application was developed by incorporating (1) principle of social learning drawn from Persuasive Technology as learning strategy at macro persuasion level, and (2) principle of modality and redundancy drawn from Multimedia Learning Principles as design strategy at micro persuasion level. The results of the study revealed that the persuasive multimedia is capable of forming positive attitude toward disabled persons. It was also found that male subjects were more responsive to the persuasive multimedia compared to female subjects.

3.0 DESIGN AND DEVELOPMENT OF PMLA

Persuasive Multimedia Learning Application (PMLA) has been built with the intention to increase children's awareness of child sexual abuse and avoid from any potential sexual abuse situations. Alessi and Trollip's Instructional Design (ATID) Model has been used as the instructional system design, which consists of three main phases, which includes planning, design and development. Meanwhile, Constructivist Learning Environments (CLEs) has been used as the environment design strategy.

3.1 Planning

The first phase in developing PMLA is planning. This phase ensures a thorough understanding of what PMLA is, and assesses all the constraints [15]. There are four steps identified in the planning phase for PMLA. The first step begins by determining the scope of the content in the PMLA. Then, it continued with identifying learner characteristics, establishing constraints, and determining as well as collecting resources.

3.2 Design

The second phase deals with the activities of assembling the content and deciding on how it is to be treated from both instructional and interactive perspective. The components in constructivist learning environment (CLE) have been adopted for the organization of the contents in designing PMLA. In PMLA, as shown in Figure 2, the CLE consists of several interdependent components which are problem based learning, related cases, information resources, cognitive tools, and conversation and collaboration tools [16]. Problem-based learning in CLEs focuses on encouraging learners to solve a given problem. Learners need to solve the problem by exploring all available knowledge components of related cases, information resources, cognitive tools, and social contextual support.

3.2.1 Problem

In PMLA, a short video is used as an introduction to a relevant problem, currently happening to children in Malaysia. When children watch the video, they would try to relate the contents to their experiences.

3.2.2 Related Cases

While watching the video, the children will relate the situation in the video with their current experiences. Relating cases enables children to examine prior experiences and relate them to the current problem. According to [16], the understanding of any problem requires experiencing it and constructing mental models of it. However, most novice learners are lack of experience. In this PMLA, the conversation between a mother and her daughter on CSA cases assists the children in understanding the implicit issues in the problem.

3.2.3 Information Resources

In order to investigate the problem, the learners need information to construct their mental model about them. So, in PMLA, the information provided to the children is related to the issue and assists in solving the problem. With that, the learners could manipulate and relate the information with their experience to solve the problem. The information in PMLA have been designed and provided by using a

combination of various multimedia elements such as text, graphic, animation, audio, and video. Children could access the information easily by clicking at the icons or menu provided in every interface.

3.2.4 Cognitive Tools

Cognitive tools are provided to help the learners to better represent the problem or gather important information needed to solve the problem. By providing information in visual form, safe touch and bad touch topics are used as a cognitive tool that could help to engage and facilitate a specific kind of cognitive processing to the children. In addition, this cognitive tool has been designed to closely mimic the nature of images to facilitate children in understanding the ideas. Then, related activities are included to test the children's understanding and their ability to identify and manipulate those images with their mental model in order to solve the problem.

3.2.5 Social/Contextual Support

In designing and implementing CLE, it is important to accommodate contextual factors to ensure successful implementation. It is also necessary to train the learners to learn from the environments. In this case, PMLA supports children learning from the environment by providing other information resources such as related pamphlets as well as websites and ways to get access to help centers such as contact number and address.

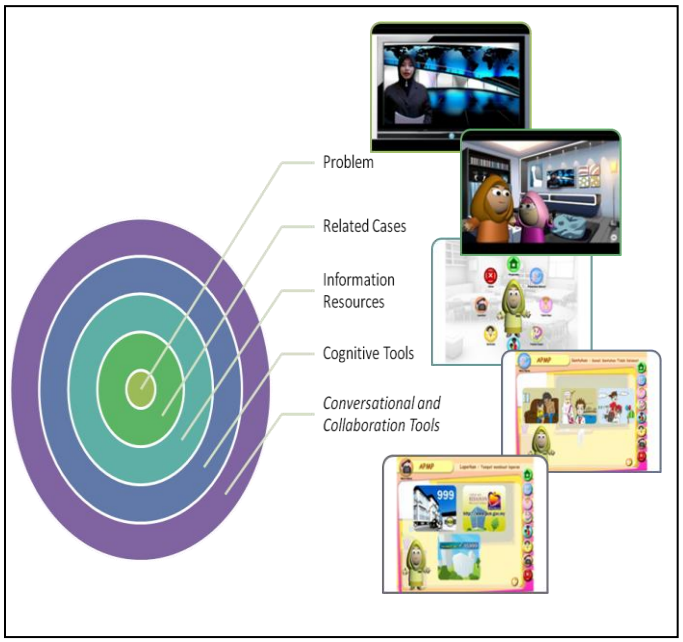


Figure 2 Applying CLE component in designing PMLA

3.3 Development

The last phase is the implementation of PMLA that includes the entire computer programming requirement. For this PMLA, all characters were designed in three dimensional (3D) representations because the target audience is children. Children normally love colorful and interesting characters. Audio recording was done based on the pre-prepared scripts. The scripts were reviewed by content experts in the field of CSA and Bahasa Malayu. Finally, the application is delivered as a standalone application using Adobe Flash.

4.0 METHOD AND EVALUATION

In the evaluation phase, a group of 222 primary school children between 7 and 9 years old from four selected schools participated in this study. Before the treatment, the facilitator will inform the students the purpose of the treatment session and introduces them to PMLA. Then, the treatment session is conducted in the school's computer laboratory, assisted by the laboratory assistant. In the experiment, children are given 60 minutes to explore PMLA. Immediately after they have explored PMLA, they are given perceived motivation test to assess children's learning experience toward learning materials. The instrument used to measure children's perceived motivation was adopted from Persuasive Material Motivation Survey (PMMS) by [12]. The instrument contains 10 items using 5-point scales: 1 (Really not agree), 2 (Not agree), 3 (Not applicable), 4 (Agree) and 5 (Really Agree).

5.0 RESULTS AND DISCUSSION

The data collected in the study was analyzed using descriptive statistic. Table 1 shows descriptive statistic for the children's perceived motivation based on the items in PMMS. Referring to Table 1, the results show that the means score for all items in PMMS is more than 4.00 out of 5.00 except for item no 2. The result shows that, generally, PMLA could help in motivating children in learning CSA. In addition, cartoon character presented in PMLA only plays a minor role in influencing children motivation in learning CSA. However, majority of the children stated that PMLA makes learning easy and interested, provides interesting resources and information and helps increase their awareness on CSA. Figure 3 illustrates children's perceived motivation toward PMLA.

Table 1 Descriptive Statistic for children's perceived motivation

	N	Min	Max	Mean	Std. Deviation
Easy to understand	222	2.00	5.00	4.47	.58386
Like cartoon character	222	1.00	5.00	3.78	.97855
Know what to learn	222	1.00	5.00	4.23	.78659
Interesting resources	222	1.00	5.00	4.32	.64623
Interesting information	222	3.00	5.00	4.34	.54508
Interested to learn	222	1.00	5.00	4.21	.87460
Fun to learn	222	3.00	5.00	4.36	.65718
Increase awareness	222	2.00	5.00	4.22	.62966
Like the instruction	222	2.00	5.00	4.10	.89396
Proud to learn	222	2.00	5.00	4.21	.78172
Total	**222**			**4.22**	

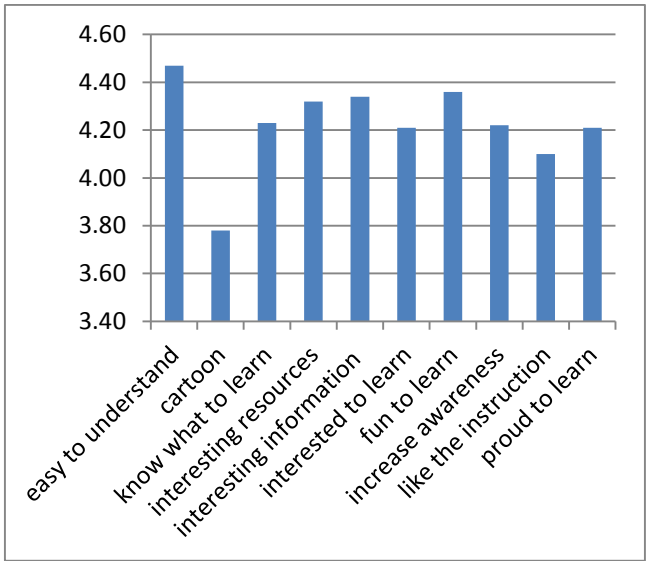


Figure 3 Children's Perceived Motivation

6.0 CONCLUSION

Motivation plays a fundamental role in learning. Every educator faces the big challenge to stimulate and sustain learner motivation. Generally, students could be motivated through various approaches. Realizing the important impact of motivation in increasing children's awareness of CSA issues, this study takes the opportunity in potential of persuasive technology and multimedia in learning. The integration of multimedia and persuasive technology in this study validates its potentials in facilitating children in understanding CSA effectively. The result of this study clearly shows that PMLA has a positive impact in children's perceived motivation. This means that children perceived PMLA as a motivational material that could be used in the learning of CSA.

References

[1] Hitrec, G. 2011. Teaching Children To Protect Themselves From Sexual Abuse. *Protecting Children From Sexual Violence*. 165-174.

[2] Bolen. R. M. 2003. Child Sexual Abuse: Prevention or Promotion? *Social Work*. 48(2): 174-185. National Association of Social Workers Inc.

[3] Mayer, R. E. 2009. *Multimedia Learning*. 2rd ed. Cambridge Universiti Press. USA.

[4] AchaJ. 2009. The Effectiveness Of Multimedia Programmes In Children's Vocabulary Learning. *British Journal of Educational Technology*. 40(1): 23-31.

[5] Beeland, W. D. 2002. Student Engagement, Visual Learning And Technology: Can Interactive Whiteboards Help? Retrived March, 18, 2013, from http://www.prometheunworld.com/uk/upload/pdf/student_engagements.pdf.

[6] McCracken, D. D.and Wolfe, R. J. 2004**.** User-centered *Web Site Development: A Human-Computer Interaction Approach*. New York: Prentice Hall Inc.

[7] Fogg, B. J. 2003. *Persuasive Technology: Using Computer to Change What We Think and Do*. USA: Morgan Kaifmann Publisher.

[8] Mayer, R. E. 2001. *Multimedia Learning*. Cambridge Universiti Press. USA.

[9] Fogg, B. J. Cuellar, G. and Danielson, D. 2002. Motivating, influencing and Persuading Users: An Introduction to Captology. In the *Human-Computer Interaction Handbook: Foundamentals, Evolving Technologies and Emerging Applications,* J. A. Jacko and A. Sears, Eds. Human Factor and Ergonomics. L. Erlbaum Associates, Hillsdale. 358-370.

[10] Hick, S. 1997. *Benefit of Interactive Multimedia Courseware*. Trican Multimedia Solutions Inc.

[11] Shank, P. 2004. The Value Of Multimedia In Learning. Adobe System Incorporated. USA, 2005. [2] McCracken D. D. & Wolfe, R. J. *User-Centered Web Site Development: A Human-Computer Interaction Approach*. Prentice Hall Inc. New York.

[12] Sobihatun Nur, A. S. 2010. The Design, Development And Evaluation Of Persuasive Multimedia Learning Environment (PMLE) In Reducing Children Dental Anxiety. *Unpublished Doctoral Dissertation*. Universiti Sains Malaysia, Penang.

[13] Wan Ahmad Jaafar, W. Y., Siti Nur Jannah, A.and Mohamed Zambri, M. Z. 2012. Application of Persuasive Multimedia to Raise Stress Awareness among the Secondary School Students. *IERI Procedia.* 3: 105-113.

[14] Wan Ahmad Jaafar, W. Y.and Mohamed Zambri, M. Z. 2012. Abuse of Disable Parking: Exploring Persuasive Multimedia as an Attitute Formation Strategy. In Mohd Ariff I., Rozhan, M. I., & Rosnaini, M. *Educational Practices in A Learning Ubiquitious Environment,* Malaysian Technology Education Association. 266-271.

[15] Alessi, S. M. and Trollip, S. R. 2001.*Multimedia for Learning: Methods and Development*. 3rded. Boston, MA: Allyn & Bacon.

[16] Jonassen, D. H. 1999. Designing Constructivist Learning Environments. In C. M. Reigeluth, (Ed.). *Instructional-Design Theories And Models: A New Paradigm Of Instructional Theory,*2. London: Lawrence Erlbaum Associates, Inc. 215-239.