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Exploring Persuasive Multimedia Techniques in Attitude and Behavior Change: A Comparative Study

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Abstract

Persuasive technology in education settings has become a popular technique used in behavior and attitude change. Due to its capability therefore the purpose of this paper is to review and examines persuasive multimedia techniques for the past four years (2010-2014) and seeks how persuasive technology can be implemented in truancy problem. Ten papers were selected based on the persuasive technique used and this study is related and scoped in Malaysia context. This paper was reviewed based on the components, elements as well as the theory and approaches that are adapted by researchers in their experiment. It can be concluded computer as a persuasive tool in changing attitude and behavior can engage and motivate the students to do the task and achieve a level of objectivity.

1. Introduction

Economic and technological developments have brought great influence on the socio-cultural and Malaysian society. However, these changes affect the community through the increased of social problems, including truancy in schools. Truancy has been a common problem faced by most rural or urban schools in Malaysia. According to the Ministry of Education, Malaysia 2012 reports, out of 111,484 discipline problem cases 19,545 cases involved truancy. In 2011, from the 108,650 discipline problem cases, 18,550 involved truanting behavior.

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From the report the highest number of discipline problem in schools is truancy compare to other discipline problems. Major research outcomes concerning on the problem of school discipline such as truancy shows why it is important for schools and communities working together to prevent and reduce truancy.

Since long, media technology has played a significant role in facilitating the delivery of persuasive messages. Gullatt and Lemoine (1997) proposed utilizing computer technology to provide early intervention besides in-school programs, strict laws and regulations and community solutions. According to Wesley (2004) integrating computer for at-risk students create a psychologically safe learning environment, building self-esteem and changes reluctant learners to motivate learners.

However, limited studies have been conducted to investigate the use of persuasive technology and multimedia used in dealing with social problems. Therefore, this paper aims to explore the persuasive possibilities available in dealing with an attitude change and conclusions on how to deal with truancy problem in Malaysia.

2. Related work

There are several researchers conducted a study related to how computer used to persuade people towards attitude and behavior change. In order to understand how to implement the persuasive technique in truancy intervention and prevention, it is important to identify components, elements as well as the theory and approaches that are adapted by researchers in their experiment that are related to this issue.

Associated with that, this paper will analyze ten persuasive multimedia techniques for the past four years (2010-2014). This related works was selected based on the persuasive technique that has been used and this study is related and scoped in Malaysia context.

2.1 Children dental anxiety

Persuasive multimedia in reducing children dental anxiety was done by Sobihatun, Wan Ahmad Jaafar and Azilah (2010). This multimedia learning was designed for children age 7-9 as an educational tool in a CDROM based multimedia learning environment to help children reducing anxiety and motivate children towards dental treatment. In order to develop children's learning and knowledge in decreasing their dental anxiety, researchers have applied six multimedia design principles guidelines; interaction in text, multimedia, navigation and search, graphical user interface and content. The persuasive technology principles used is; the Principle of Virtual Rehearsal, Principle of Similarity, Principle of Praise and Principle of Social Learning. Multimedia design principles were integrated into the learning environment to facilitate the learner's intention. Result from the study shows that this application successfully reduces children's dental anxiety.

2.2 Smoke shooter

Dangers of smoking campaign has been discussed in many researcher, but only a few discuss about how to change the attitude of smokers especially to young generations. Mohammad, Siti Zulaiha, Arifah Fasha & Nor Liyana (2012) have proposed a conceptual framework on the danger of smoking campaign for children's health. Researchers have applied six principles of persuasive technology into the interactive mobile game to influence a child's behavior into rejecting smoking habits from the early age. Bandura' Social Learning Theory and Fogg' Behavior Model were used in their design. Smoke shooters rely on the principle of cause and effects which triggers children to avoid smoking habits. This mobile game combined with a repetitive sequence of presentation and information highlighted the danger of smoking would raise the student's attention in avoiding cigarette and smoking habits.

2.3 Persuasive multimedia stress awareness

As presented by Wan Ahmad Jaafar, Siti Nor Jannah and Mohamed Zamri (2012), the increasing of stress among students motivates researchers to develop a stress awareness application for secondary school students. This prototype integrated theory of multimedia learning as basics and implemented it with instructional design

and combined the development of persuasive multimedia onto the design prototype. The implementation of this application consists of two types of media; videos to indicate the statistics followed by presentation on cause-and-effects and interactive multimedia on stress. To encourage students to avoid symptom of stress, researchers had implemented cause-and-effects and similarity principles in their design to simulate the environment they faced that could be happening.

2.4 Child sexual abuse awareness

This paper reports preliminary studies on the current situation in Malaysia on how to prevent child sex abuse by using persuasive multimedia. Since the current campaign remains insufficient, this research done by Azliza and Wan Ahmad Jaafar (2013), attempt to help children develop awareness regarding sexual abuse and seeking the proper guideline when this situation happened. This paper also tries to search an effective way how to raise awareness and help to design educational program material and method in prevention and intervention. From the preliminary studies researchers concluded there is a need to design and develop a multimedia learning associated with persuasive learning to raise awareness since materials regarding this issue is limited.

2.5 Abuse disabled parking

Wan Ahmad Jaafar and Mohamed Zamri (2014) in their research believe attitude is a main factor contributes to the abuse of disabled parking. Persuasive multimedia treatment in abuse disable parking is a foundational study on how to apply persuasive theoretical knowledge to respect disable parking by non-disabled persons. This study has divided two approaches in an attitude change treatment; it is macro persuasion level involved embedded social learning theory in the applications and micro persuasion level where modality and redundancy principle as design strategy were applied. Finding from the studies found that persuasive multimedia have a great potential to be used as an attitude treatment in misuse disable parking.

2.6 Mathematic learning "Li2D"

Mathematics is a difficult subject to master among student, especially those with negative attitude towards it. Since computer technologies has caused a new paradigm in a way of learning Zuraini Hanim and Wan Fatimah (2011) have designed a new approach of learning in mathematics using computer based learning in their courseware. From the courseware researchers has implemented teaching and learning strategies such as simulation, pedagogical agent, game based learning and blended learning with the aim to attract students to learn. In conclusion, although this courseware is not specifically applied the principle of persuasive technology but some of the techniques to attract and change attitudes towards learning mathematics is already implemented.

2.7 I-IQRA

IQRA is an interactive multimedia application for children recognize Arabic characters and recite Al-Quran. It was developed by Arifah Fasha and Nadia (2011).To persuade children to learn Arabic characters, multimedia applications based on Iqra' technique has been implemented by the researchers. Researchers have adapted six persuasive technology principle inserted in the instructional design in learning and recognized characters. The principle of information quality, principle of similarity, principle of contiguity, principle of self monitoring, principle of praise. From the finding researchers found that by combining persuasive technology in multimedia its shows significant impact on learning to recite Al-Quran.

2.8 Virtual Hajj(V-Hajj)

V-hajj is a multimedia courseware incorporates virtual environment (VE) to support elders in active and self-guided reading. This work seeks to utilize persuasive design in changing the position and behavior of seniors (40 years and above) who was found to dislike the technology based supplementary provided by Lembaga Tabung Haji(LTH). From this situation, researchers Mohd Fitri, Abdul Nasir and Nor Fadziana (2011) have come up with an idea to combine 3D visualization implemented with a persuasive technology technique to allowed

pilgrimage performing their task and rituals. The capability of virtual environment (VE) to imitate the real world environment and its interactivity to entertain provides users with a new experience similar to the real life situation. The principle of persuasive technology was employed in most applications or products in persuading target users to follow the learning sequence. Six principles were used: principles of cause and effect: simulations, principles of virtual rehearsal, principles of simulations, principles of attractiveness and principles of conditioning.

2.9 Persuasive learning for elder

To persuade older people in using a computer is very challenging. Abdul Nasir, Nurtihah, Juliana Aida, Ruzinoor and Mazida (2013) have suggested to use multimedia learning to elders, since there is evidence that elder people much prefer a traditional learning compare to learning using computers. In order to attract the elder, researchers have proposed a conceptual model in an attempt to promote older people to learn using a computer. The conceptual model was developed from the three broad categories; interactive media, interactive persuasive elements and the learning outcomes. Three types of computer simulations were used in this model; simulated cause-and-effect simulated environment and simulated objects. It can be concluded that to increase the knowledge of elder people, the ability of media to persuade and motivate in delivering the content should be considered.

2.10 Islamic Sex Education (ISE) courseware

Islamic sex education (ISE) courseware is the only applications that highlighted the importance of religion in prevention and intervention on sex deviant problem in Malaysia done by Abdul Nasir, Nurtihah and Fadzilah (2012). Researchers had proposed sex education and moral program in an attempt to change parent's perception of teaching sex education to their children. This educational material provides guidelines for parents to assist their children based on the Islamic approaches for sex education. The development of coursework is based on macro design strategies and micro design strategies. Principle of enlightenment, threat and binding elements were used in the macro design strategies to grab learners motivation and attention. In conclusion, this coursework will help parents towards the importance of sex education but also provide knowledge to them.

3. Findings

From the above discussion, Table 1 shows the summaries of persuasive technique used by researchers to find an answer related to attitude and a behavior change. Most of the papers reviewed discuss the implementation of persuasive technique in a domain of education and learning. It shows that all the intended consequences of persuasive technology in the given implementation show increasing of engagement along with motivation through persuasion, it also includes increasing user's awareness and encouragement.

Table 1. Type of persuasive technique.

Project	Author	Principle
1) Children Dental Anxiety	Sobihatun, Wan Ahmad Jaafar and Azilah (2010)	• Virtual Rehearsal • Similarity • Praise • Social learning
2) Smoke Shooter	Mohammad et al. (2012)	• Praise • Cause and effects • Attractiveness • Mobile simplicity • Information quality
3) Persuasive Multimedia Stress Awareness	Wan Ahmad Jaafar, Siti Nor Jannah and Mohamed Zamri (2012)	• Cause and effects • Similarity • Social learning

4)	Child Sexual Abuse Awareness	Azliza and Wan Ahmad Jaafar (2013)	• Cause and effects • Simulation • Similarity • Virtual Rehearsal
5)	Abused Disable Parking	Wan Ahmad Jaafar and Mohamed Zamri (2014)	• Virtual Rehearsal • Similarity • Praise • Social learning
6)	Mathematic Learning "Li2d"	Zuraini Hanim and Wan Fatimah (2011)	• Simulation • Attractiveness • Praise
7)	I-Iqra	Arifah Fasha and Nadia (2011)	• Similarity • Information Quality • Contiguity • Self Monitoring • Praise
8)	Virtual Hajj (V-Hajj)	Mohd Fitri, Abdul Nasir and Nor Fadziana (2011)	• Cause and effects • Virtual Rehearsal • Simulation
9)	Persuasive Learning For Elder	Abdul Nasir et al. (2013)	• Attractiveness • Conditioning • Cause and effects • Simulation • Ease-of-Use
10)	Islamic Sex Education (ISE) Courseware	Abdul Nasir, Nurtihah and Fadzilah (2012)	• Enlightenment, • Threat • Binding • Cause and effects

4. Conclusions

Based on the reviewing papers related to multimedia as an attitude change, design guidelines may be considered when designing for an effective persuasive multimedia over truancy. Thus, this study will consider to focuses on the attitude development using persuasive multimedia as a first move in the technology, especially in the psychological. However persuasive technology, technique and principle that are appropriate to the truant students' behavior need to be determined. Therefore, the type of persuasive technology principle and multimedia learning principles should be outlined.

It can be concluded that with the help of the computer as a persuasive tool in changing attitude and behavior, persuasive technology could be used in truancy intervention. A persuasive multimedia technology that persuades learners intentionally makes learning fun and enjoyable and easier to engage and motivate the students to do the task and achieve a level of objectivity. Consequently, it will assist many truant students in improving their behavior, psychology and academic performance as well.

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