Persuasive Multimedia in Truancy Awareness (PMTA): Integration of Persuasive Design Principles

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Abstract—**This article reports on the ongoing research which focuses on the use of persuasive design principle in the design and development of multimedia learning application for truancy awareness (PMTA).Primarily, this paper emphasizes on how persuasive design principle can be employed into a multimedia learning environment in fostering truancy awareness. This paper is presented in the following order; firstly, the current situation regarding truancy issues is explained. Next, the current practices on how to handle truancy issues are highlighted. The third part discusses the theoretical framework and how the principles were applied in designing the information and presentation of PMTA. In conclusion, it is hoped that PMTA would be a beneficial tool for rising truancy awareness and reducing this problem in Malaysia. The next step of this study will involve with experimental testing to evaluate the effects of the persuasive multimedia applications toward truancy awareness.**

Index Terms—**Multimedia Design Principles; Persuasive Design Principles; Truancy Awareness.**

I. INTRODUCTION

Truancy, school disengagement, absenteeism or unofficial absences, from compulsory schooling are the terms for the same widespread social problem: poor school attendance. Truancy as reported by [1] and [2] continues to be a major problem in most schools in Malaysia. As reported by the Ministry of Education Malaysia from year 2008-2012 school sessions, report shows that, truancy contributed to almost 32% of school misbehaviours

Many previous studies showed that truancy increases in parallel with students' age [3],[4]. According to [5], truancy is much more prevalent in secondary schools compared to primary schools and the rate of truancy increases as a student became older.

In Malaysia, prevention attempts in reducing truancy primarily mostly focus on school-based counseling and discipline teacher as a solution in interventions of truancy [6]. However, as demonstrated [7] study, these students often feel that guidance and counseling teachers have harmful intentions on them.

The students perceived the meeting with school counselor as a punishment or being penalized without reason; as a result involuntary feeling happened to the treatment student.

II. CURRENT PRACTICE OF HANDLING TRUANCY

In Malaysia, prevention attempts in reducing truancy primarily mostly focus on school-based counseling and discipline teacher as a solution in interventions of truancy [6]. However, as demonstrated in [7] study, these students often feel that, guidance and counseling teachers have harmful intentions on them. The students perceived the meeting with school counselor as a punishment or being penalized without reason.

Research have shown that self-awareness is identified as one of the important areas that can improve student attendance and student performance [8],[9] besides school policies, supervision and prevention programme.

With so much emphasis being placed on the use of multimedia instructional material in schools, it is surprisingly found that very little indication exists that school systems are using multimedia instructional as a solution for truancy prevention. Thus the lack of studies on the effects of using multimedia technology on truancy awareness prompts questions about its importance

Therefore, the implementation of persuasive multimedia for awareness of truancy which emphasizes on student's self-awareness is crucial in the context of Malaysian education system. In conjunction with the statement, the main purpose of this study is to propose a persuasive multimedia application in truancy awareness by manipulating the power of persuasive technology principle and multimedia design principle.

III. THEORITICAL FRAMEWORK OF PMTA

The rapid development of multimedia technology has introduced a new way on how human acquire information. This technology is known as interactive multimedia. The "interactive multimedia" refer to the process of delivering multimedia related applications that allow users to control the environment of the computer.

Interactive multimedia enables multimedia elements to be used in presentations and learning purposes to strengthen and enhance users' understanding and consequently persuade the learners [10]. Therefore, multimedia has the advantage as a digital persuader to convey messages for better learning and understanding in an interactive way [11].

The interactive properties of computers has enabled

designers of technology to use computers as a persuasive tool to employ influence techniques and interact with users to change or reshape their attitude and/or behaviour. This technology that changes attitudes and behaviour is called persuasive technology [12]

PMTA employed two theoretical foundations which are based on Persuasive Technology or "Captology" theory [13] and Cognitive Multimedia Learning Theory (CTML) and multimedia learning principles [14]. On top of that, the design and development PMTA model is based on two development strategies that incorporates both the macrosuasion and microsuasion strategies. Macrosuasion strategies involved in overall persuasive context of the PMTA model, this includes strategies that emphasize how the information about truancy awareness will be conveyed to the users.

Microsuasion strategy refers to smaller persuasive techniques or presentation techniques that are suitable to achieve the overall goal (macrosuasion). As suggested by [12], microsuasion strategy should involve with the selection, sequence and organization of subject matter topics e.g. awareness contents to be presented. Microsuasion features can be embedded into specific elements such as icons, dialogue boxes or interaction between computers and users. Additionally, multimedia learning applications, applying microsuasion elements to engage users for staying to specific information of the presented material. Figure. 1 illustrates the overall theoretical framework that incorporates both the persuasive technology principles and multimedia design principles.
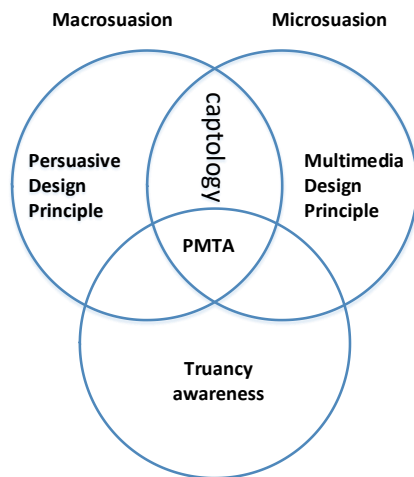

Figure 1: Theoretical Framework of PMTA

With the element of persuasion in computers known Captology, researchers have designed and developed a Persuasive Multimedia in Truancy Awareness (PMTA) prototype. PMTA is a computer-based learning material for truancy awareness; aim for students aged 13 to 15. This prototype known "Kitakan Kawan", adopts a role-playing strategy where players will assist a virtual character named "Aiman" to solve his problem in different situations.

The "Kitakan Kawan" is developed in Malay to suit the target learners. The actual content of the prototype comprises 5 scenario encountered by students during school session. Each of the sessions is followed by question and feedback were given for each selected answer.

To support the role-playing strategy, this prototype also employs scenario-based learning where it involves students working independently through its storyline. During each scenario, players are required to analyze, evaluate and solve different situation and need to select possible answers to tackle the problem.

This allows the students to immerse in a real situation and permit them to gather new information and open new perspective that will benefit them. Figure 2 shows the snapshot of the persuasive multimedia of PMTA.

Figure 2. Snapshot screen of "Kitakan Kawan"

IV. PERSUASIVE DESIGN PRINCIPLES AS MACROSUASION STRATEGY

Persuasive design is a relatively new design paradigm on how to plan information activities that exclusively addresses attitude and behaviour [15]. This concept comprises embedding persuasive arguments into physical objects (including software and hardware), in essence to delegate the act of persuasion [16]. Therefore, an approach of persuasive design is required to achieve the desired outcome. Examining the strategy in developing successful persuasive system is crucial for designer and developer to make sure the target users will be persuaded.

For the purposes of this study there are four persuasive principle were applied into the PMTA development based from the systematic review done by [17]. There are (i) Principle of Similarity (ii) Principle of Cause and Effect (iii) Principle of Attractiveness and (iv) Principle of Praise. The discussion of persuasive principle were elaborated in detail as follow.

A. Principle of Similarity

It is suggested that products may be more persuasive if they match the personality of target users or are similar in other ways [18]. This principle suggests that people are easily persuaded when they feel the situation is very similar related to their background, personality or preferences. With the aim to engaged students with the applications, this principle are adopted through school environment, class environment, the use of language and familiar voice used for voice over and narration.

On top of that, similarity principle is also presented in term of situation dealing with teachers, peers to mimic the user's real environment. Figure 3, illustrates the situation happened to "Aiman" where he questioning why he need to go to school. Using the similarity principle the learners need to response from the question and proposed the suitable answers. Since the learners have experiencing the same situation, thus they are readily to react to the situation and select the appropriate answer.

Figure 3. Snapshot screen of similarity principle

B. *Principle of Cause and Effect*

The principle of cause and effects as describe by [13] enable designer to simulate any scenario/situation by enabling people to observe the immediately link between cause and effects. For example persuasive multimedia of PMTA explore the effects of truant behavior to student life by creating virtual scenario, showing the consequences of truant.

The scenario was presented in a storytelling style where the student will react to cause and effects using a series of statement. Based on the statement given students will select the suitable answers to handle the situation. If the students select the correct answer, a statement will and notify the student either it is a good selection or not. Along with the answer, reflection with the selection. This principle enable students to gain insight into the consequences of their attitude and behavior. Figure 4 illustrated the application of cause and effects principle.

Figure 4. Snapshot screen of cause and effects

C. *Principle of Attractiveness*

Physical appearance that is attractive has a significant impact to persuade. This can be seen that the more attractive technology will have more persuasive power compare to unattractive technology [13]. Since PMTA is developed for student, attractiveness can be embedded through interactive interface, convenience, easy to use and high quality of information. In addition rewarding positive feedback and reflection from the selected decision will support in achieving the target behavior.

D. *Principle of Praise*

Principle of praise is an interesting element in human computer interaction. This principle works by using computer technology to persuade human through positive feedback via words, images, symbols or sound to lead users more open to

be persuaded. Applying this principle will help users following the target behaviour and consequently increase chance the users change behaviour or attitude.

In this persuasive multimedia learning, praises were provided when certain goal is reached through sound alert and visual. For example, for each selected decision, student will receive a feedback whether the student answer the question correctly. The computers will gives feedback once the condition is applied such as "Tahniah! /Congratulations" or "Sila cuba lagi/Please Try Again".

By applying this principle, researchers hopes that this multimedia learning interaction will engage student to explore more towards the end of the application. Figure 5 shows how the praise principal were used in persuasive multimedia.

Figure 5. Snapshot screen of principle of praise

V. MULTIMEDIA DESIGN PRINCIPLES AS A MICROSUASION STRATEGY

The selection of multimedia learning principles have implications over the presented content. Examining the multimedia learning principles in developing successful persuasive system is crucial to make sure the target users will improve their meaningful learning. For the purposes of this study, there are six multimedia design principle were applied based from the systematic review done [17]. There are four multimedia design principles that have been identified and applied into this study. There are principle of coherence, principle of redundancy, principle of modality and principle of multimedia design,

A. *Coherence principle*

The coherence principle describes users learn better when from multimedia presentation when any unrelated material such as word, pictures and sound are excluded rather than included. Adding extraneous materials will affects the leaners attention and learning process, therefore in the development of PMTA any extraneous material were avoided in order to keep the presentation as concise as possible. In this persuasive multimedia learning, coherence principle were applied by avoiding irrelevant background music, sound effects and on-screen graphics. Other than that, the use of long and complex phrases were also avoided to help students focus on the main information.

B. *Redundancy principle*

The redundancy principle suggest that multimedia materials should not simultaneously applied at the same time for presentation such as using a combination of texts, graphics, audio, video and narrated animation with on-screen text during multimedia presentation. For the development of PMTA this principle was applied by combining graphics and text only or graphics and spoken words into the selected presentation. As suggested by [19] it is better to use the

auditory and visual material for verbal information if there is no other material to support the presentation. On the other hand, researchers are also employ a transition and time-delayed between presented materials to avoid cognitive overload to the students.

C. Modality Principle

The modality principle concern on how information should be processed by learners to build the understanding and working memory is not overloaded. [13] stress that any presentation that involving both words and pictures should accompanied by auditory or spoken words rather than printed text alone. For the development of PMTA this principle was applied as illustrated in Figure 6, where voice over narration to support the pictures to view the scenario. Whereas the purpose of a dialog box is to minimize the written text and to support the characters' behaviour to trigger student to response the situation. When words are presented as spoken text, the written text is minimized, thus this information do not overload visual working memory, hence allowing for deeper understanding and enhancing the learning.

Figure 6. Snapshot screen of modality principle used in PMTA

D. Multimedia Design Principle

The principle of multimedia design is one of the prominent principle in learning in which, when word and pictures are both presented in multimedia presentation could enhance the learning [19]. This type of presentation enable learners to construct visual and verbal mental model by creating connection between both elements. The practical example is illustrated in Figure 7 when this text or narration is coupled with visual images. Other than that, icon are also created by following the multimedia design principle where both the icon and images are presented in meaningful way.

Figure 7: Snapshot screen of multimedia principle used in PMTA

VI. CONCLUSION

In summary, the proposed PMTA multimedia application gives particular attention on how to create awareness using multimedia contents with the help of persuasive strategies. As mention in theoretical framework, this study incorporates the macrosuasion and microsuasion strategies in prototype development. Thus understanding the common components applied by the researchers in developing a persuasive application to create awareness towards certain behavior really implicated this study. Accordingly, by understanding the related components it will help to develop PMTA application in a systematic way.

To ensure the proposed PMTA model is applicable; it must be evaluate with learners which is school students. Accordingly, the next step of this study will involve with experimental testing to evaluate the effects of the persuasive multimedia applications toward truancy awareness.

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