Towards Developing a Therapeutic Computer Game for Adolescent Suffering from Depression: A Preliminary Study

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ARTICLE INFO	ABSTRACT
	Mental health problems among adolescents are growing throughout the world today. In recent years, many researchers have studied the use of video games and other off-the-shelf gaming approaches to treat various problems in mental illness. The popularity of digital game among people these days has given opportunity for therapists to assist them in psychotherapy sessions. Hence, this paper reports on some early investigation done on this topic to acquire a more in-depth understanding of the existing problems by conducting a series of consultations with game developers and experts in the area of therapy. The preliminary results indicate a desideratum for future design and development in therapeutic computer games for adolescents.

INTRODUCTION

In Malaysia, depression is among the most prevalent mental illness and it keeps increasing every year (Chun, 2012). One of the factors that leads to this scenario is the difficulty to engage young people in the treatment. In fact, many of them also refused to receive any appropriate treatment. Young people aged between 10 and 18 are a group in which the therapists find difficulty to reach them. Furthermore, this group is a particularly sensitive age group since there are quite a number of changes in the life at this level of age. People are not the only factor, but poor treatment also contributes to this situation (Coyle *et al*, 2010: Matthews and Doherty, 2011). Therefore, it is highly important to provide an efficient treatment service in reducing the number of people suffering with mental illness.

The fact that widespread popularity and comprehensive benefits can be obtained from using game, this has increased the interest of researchers and health professionals to use serious game in the treatment (Lavender & Gromala, 2012). To date, the use of serious games has already been utilized as an assistive tool in several mental illnesses, for instance, during psychoeducation in chronic disease management (Ceranoglu, 2010), physical therapy (Geurts *et al*, 2011), and also in mental health psychotherapy interventions (Stallard *et al*, 2010). Besides, previous studies had proven the effectiveness of using games in therapy as an assistive tool in several mental illnesses (Fernández, 2012). Therapeutic games in psychotherapy allow young patients to perform home-based psychotherapy anywhere and anytime. These therapeutic games also accommodate high level of flexibility to the adolescents for they can carry out the psychotherapy session at their own comfort zone such as at their home while there is no uncomfortable feeling in the presence of strangers or therapists (Matthews and Doherty, 2011).

This paper observes at some related works on utilizing games in psychotherapy and its benefits for adolescents. To gain more insight on the current situation and problems faced by therapists during therapeutic session, an initial study was carried out. The findings from this study will be discussed in this paper.

2. Games Utilization In Psychotherapy:

Despite the wide range of effective treatments available for depression, there are still highly needed for more researches to improve the clinical treatments (Rocha and M. Henriques, 2012). With rapid diffusion of information technology nowadays, therapists should take the opportunity to fuse technology into the treatments. Technologies such as internet, virtual reality, computer games and handheld devices are capable to engage patients into the treatments. Among these technologies, the efficacy of computer game has been proven to be

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eminently effective to improve the treatments, but this area is still fairly under-researched (Matthews and Doherty, 2011: Szczesna *et al*, 2011).

Recent researches have shown that using games in psychotherapy can help establish a therapeutic relationship between two parties: therapist and patient. A successful psychotherapy depends on the positive progress of the relationship between these parties. This is because most of the patients, usually children and adolescents, are having problems with traditional psychotherapy (Coyle and Doherty, 2009). There might be a feeling of uncomfortableness for the patients to share their feelings, at the same time experiencing language skill differences with their therapists that eventually leads to the failure of psychotherapy (Ceranoglu, 2010). Thus, it is very important to ensure the engagement of patients during the psychotherapy session (Matthews and Doherty).

3. Preliminary Study:

In order to understand and identify issues of therapeutic environment and game design methodology, a preliminary study with a group of experts was conducted. The main aim of this study is to identify the current practices in game industries and psychiatry area. It is critical to understand both areas before producing the design model for therapeutic game. A total of eight experts participated in this study. The findings from this initial study also will be used as a guideline to develop an appropriate model of design methodology for therapeutic games.

4. Expert Consultation:

There are two types of group for expert consultation in order to obtain empirical evidence. The first group involves with those from game industries. Six game companies which are the experts in game industries were selected to partake in this study. These six experts were from Malaysia, New Zealand, and United States of America (USA). Table 1 summarizes the company demographics of these experts.

The rationale of conducting the consultation with the experts in game companies is because for the preliminary study, there is a need to comprehend and identify the design guideline and methodologies which are currently applied by different developers in the game development process. Even though there are many design processes and methodologies exist, seeking the specific steps would provide alternatives.

Table 1: Company Demographics

Company	Year of Establishment	Country
A	2011	Malaysia
B	2010	Malaysia
C	2006	Malaysia
D	2003	New Zealand
E	1996	USA
F	2011	USA

The second expert group involved two mental health professionals from government hospitals. Table 2 summarizes the demographic for these experts. It is important to seek knowledge about current practices in the mental health area. Thus, conducting consultation with the professionals helps to understand procedures or techniques involved in dealing with adolescents suffering with depression. The outcome of this stage could be adopted as a part of therapeutic game model design that will be developed later.

Table 2: Experts Demographics

Expert	Expertise	Years of Experience
A (Psychiatrist)	Child and Adolescent Psychiatry	11
B (Psychologist)	Child and Adolescent Psychology	10

5. Methods:

In order to obtain required data for this preliminary study, a basic analysis method was used during the data collection. Several mediums of communication were used; face-to-face, phone calls and emails. Online questionnaire was used as the method of gathering information from game industries. Meanwhile, interview session is selected to obtain the required data from the mental health professionals.

6. Findings:

An analysis was conducted to investigate the difference of game design and development by looking at the stages, activities, and flows involved. Based on feedback from the experts, most of them relatively used similar general main stages: pre-production, production, and post-production. The first phase is pre-production where

most of the activities involved are related to the planning of the game before proceeding to the production stage. In the production phase, the process of game development begins together with the process of coding and content integration. The third phase is post-production, which is the final stage in game design and development, and this phase typically involves finalizing the game before it is published.

There is a connection in the cycles of design and development model from one stage to another. This connection also shows how the data moved and used in every stage. This result illustrates that in terms of flow and cycle, the experts suggested that the flows of the model must be iterative and flexible to ease the design and development process. The activities involved as suggested by the experts in designing and developing a game can be summarized and subjected to these three phases, as can be found in Table 3, 4, and 5.

Table 3: Activities and Phases Suggested in Pre-production

Company	Pre-production
A	• Design Phase • Concept Art
B	• Game Concept • Study on Game Platform • Study of Target Audience • Planning
C	• Generate Idea • Planning
D	• Concept • Game Design
E	• Identify concept • Concept Art
F	• Planning

Table 4: Activities and Phases Suggested in Production

Company	Production phase
A	• Modeling • Programming
B	• Determine the Game's Rule • Developing Game Levels • In-house Testing
C	• Prototype Development • Coding
D	• Game Development • Testing
E	• Prototype Development • Programming
F	• Prototyping • Updating and Changing

Table 5: Activities and Phases Suggested in Post-production

Company	Post-production
A	• Test • User Test • Deployment
B	• Publishing
C	• Testing • Publishing
D	• Debugging • Testing • Deployment
E	• Testing
F	• Assuring Quality

The obtained findings from consultation session with mental health professionals show that most of the materials and techniques applied by mental health professionals are based on non-technology methods such as pen and paper, toys, questionnaires and talking therapy. There are several issues faced by the experts during the treatment. The appointment with their patients can only be set once in two or three months. This is due to time constraint and lack of human resources that can handle the treatment. For this reasons, the professionals agreed that using digital game in psychotherapy environment as an assistive tool could help them in engaging with patients and make the treatment sessions more interesting and interactive.

Conclusion:

The goal of this study is to develop a therapeutic game for adolescents suffering from depression. There is a high demand to develop a new assistive technology to improve existing method in treating depression. The use of game as an effective tool in various area has already been proven to promote effectiveness among adolescents.

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REFERENCES

Ceranoglu, T.A., 2010. "Video Games in Psychotherapy. General Psychology", 14(2): 141-146.

Chun, M., 2012. "12 % Malaysians suffer from some forms of mental illness. The Sun Daily Online", 17-Feb-2012.

Coyle, D. and G. Doherty, 2009. "Clinical Evaluations and Collaborative Design : Developing new technologies for mental healthcare interventions", Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp: 2051-2060.

Coyle, D., M. Matthews, G. Doherty and J. Sharry, 2010. "Engaging with mental health : a global challenge", Workshop on Interactive Systems in Healthcare at ACM CHI., pp: 33-36.

Fernández-Aranda, F., S. Jiménez-Murcia, J.J. Santamaría, K. Gunnard, A. Soto, E. Kalapanidas, R.G. a Bults, C. Davarakis, T. Ganchev, R. Granero, D. Konstantas, T.P. Kostoulas, T. Lam, M. Lucas, C. Masuet-Aumatell, M.H. Moussa, J. Nielsen, and E. Penelo, 2012. "Video games as a complementary therapy tool in mental disorders: PlayMancer, a European multicentre study". Journal of mental health (Abingdon, England), 21(4): 364-74.

Geurts, L. , V. Vanden Abeele, J. Husson, F. Windey, M. Van Overveldt, J. Annema and S. Desmet, 2011. "Digital games for physical therapy". Proceedings of the fifth international conference on Tangible, embedded, and embodied interaction - TEI '11: 117.

Lavender, T.J. and D. Gromala, 2012. "Audition, The Game. Procedia Computer Science", 15: 187-192.

Matthews M. and G. Doherty, 2011." In the Mood : Engaging Teenagers in Psychotherapy Using Mobile Phones". Proceedings of the 2011 Annual Conference on Human Factors in Computing Systems (CHI'11), 2947-2956.

Matthews, M. and G. Doherty, 2011. "My Mobile Story: Therapeutic Storytelling for Children". Proceedings of the 2011 annual conference extended abstracts on Human factors in computing systems - CHI EA '11: 2059.

Rocha, A. and M. Henriques, 2012. "ICT4Depression: Service oriented architecture applied to the treatment of depression". Computer-Based Medical Systems (CBMS), 2012 25th International Symposium, pp: 1-6.

Stallard, P., S. Velleman, and T. Richardson, 2010. "Computer Use and Attitudes Towards Computerised Therapy Amongst Young People and Parents Attending Child and Adolescent Mental Health Services". Child and Adolescent Mental Health, 15: 2 80-84.

Szczesna, A., J. Grudzinski, T. Grudzinski, R. Mikuszewski and A. Debowski, 2011. "The psychology serious game prototype for preschool children". 2011 IEEE 1st International Conference on Serious Games and Applications for Health (SeGAH), pp: 1-4.