

Exploring the Use of Educational Video Games as self-management tools for Children and Adolescents with Type 1 Diabetes Mellitus

Jonas Lauritzen^{a,b}, Eirik Årsand^{a,b,c}, Alexander Horsch^{a,b,d}, Luis Fernandez-Luque^{b,e}, Taridzo Chomutare^{a,c}, Johan Gustav Bellika^{a,b,c}, Ole Hejlesen^{a,b,f}, Gunnar Hartvigsen^{a,b,c}

^a*Department of Computer Science, University of Tromsø (UiT), Tromsø, Norway*

^b*Tromsø Telemedicine Laboratory (TTL), University of Tromsø, Tromsø, Norway*

^c*Norwegian Centre for Integrated Care and Telemedicine (NST), University Hospital of North Norway, Tromsø, Norway*

^d*Institut für Medizinische Statistik und Epidemiologie, Technische Universität München (TUM), Germany*

^e*Northern Research Institute, Tromsø, Norway*

^f*Department of Health Science and Technology (AAU), Aalborg University, Aalborg, Denmark*

Introduction

Adolescents with Type 1 Diabetes Mellitus (T1DM) are often associated with insufficient self-management, including poor treatment adherence and poor blood glucose regulation. This can result in unpleasant short-term complications and over time long-term complications, which can be disabling and reduce quality of life. The low treatment adherence and poor self-management skills in adolescents necessitate a different method of educating children and adolescents about their condition and how to properly treat it, while motivating them to adhere to the treatment.

In recent years, video games has become one of the most popular form of entertainment for children and adolescents, with 8-14 year old averaging 52-65 minutes spent per day playing video games. Studies using video games for health educational purposes (serious games) has been tested and produced promising results, such as reduction in emergency visits, increase in knowledge about T1DM, awareness of risk factors improved daily self-care, self-monitoring, adherence, attitude towards prevention and better communication about the illness in the family and with clinicians.

Social media/networking sites have also become increasingly popular among children and adolescents and can also be used for healthcare purposes. A study show, how patients with T1DM, their family and friends use Facebook as a forum, in which they share experiences with others, give treatment advices and ask questions and receive feedback about diabetes related matters.

Both social media and video games constitute two promising platforms for delivering health related information and education, that the target group is familiar with and enjoy. Combining these into a health oriented serious social game experience could further advance treatment education and motivation for children and adolescents with T1DM.

Materials and Methods

Popular casual games with social media integration for children and adolescents on the social networking site Facebook were analyzed, in order to determine success factors of the games.

Chosen games in this study include FarmVille, Mafia Wars, Simply Hospital, Word Challenge and quizzes. Analysis of the games found that 3 dominant game play characteristics were used: (1) Learning a skill and improve it by micro-management. In order to progress, the player must learn different aspects of that game mechanic and how to plan ahead. (2) Reward mechanisms. Players are rewarded, with virtual trophies or new game content for their progress and achievements in the game and can share/show their rewards with other players and challenge them to do better. This game mechanic induces the player motivation to keep playing, improve their skill and receive new rewards. Showing ones rewards and issuing challenges addresses the other players' desire to compete and thus motivates them to keep playing and do better (3) Players can ask other players help, which address other players' desire to help others. Both the player asking for help and the helping player will benefit from this by receiving rewards and being able to see how helping made a difference.

Discussion

Video games and social media are popular among children and adolescents and can produce positive clinical results, which suggest combining these, making serious games with social media integration. Existing video games with social integration constitute a huge market, where players interact and build communities to share and learn game mechanics and improve ones skills and knowledge. Combining these beneficial social media integrated gameplay mechanics with serious games, could result in a valuable tool for educating children and adolescents with T1DM about their condition, how to treat it and keep them motivated to adhere to the treatment. At TTL a project is started, with aim to investigate this field in detail, produce such games and test the outcomes of using these and contribute in the field of serious gaming and T1DM self-management.

Address for correspondence

Jonas Lauritzen: Jonas.N.Lauritzen@uit.no