MITACS ACCELERATE
RESEARCH GRANT PROPOSAL

Mitigating Anxiety Through Experiential VR

From:
Jodie Joanna Giesz-Ramsay
Ryerson University
Feb 25, 2017

1. RESEARCH PROPOSAL SUMMARY

1.1. Title of project:	Mitigating Anxiety Through Experiential VR		
1.2. Type of project: Please indicate (x)	(**x**) Standard		
	(_) Cluster (minimum of 6 internships and 3 interns)		
1.3. Number of Internship units:	3		
1.4. Keywords to identify reviewers: (3-10 specific keywords; 50% technically related, 50% discipline-related)	Virtual reality, mental health, social anxiety, children		
1.5. Academic discipline:	Select Discipline	Sciences, Social Sciences, Arts and Humanities	
1.6. Project priority sectors:	Entertainment and media	New and digital media	Health and related sciences and technologies
Please **rank up to three** top priority sector(s) of your project:	1	2	3
1.7. Project purpose: Please indicate (x) the advancement you want to achieve with this internship	(**x**) Creation of **new** materials, devices, or products		
	(_) Creation of **new** processes or services		
	(_) Improvement of **existing** materials, devices, or products		
	(_) Improvement of **existing** processes or services		

1.8. List of participants:

Supervisor(s)	Department	University
Alex Ferworn	Faculty of Engineering and Architectural Science	Ryerson University

Partner organization(s)	Contact name at partner organization	Province of organization	Partner Legal Status
Corus Entertainment	Athena Georgaklis	Ontario	Select Legal Status For profit private Canadian corporation
			Select Legal Status
			Select Legal Status

1.9. Proposed work plan for internship unit(s) (IU):

Please summarize the work plan by showing which intern will work on which objective and when. Do not provide any detail here; present them in Section 2 instead.

Intern Name	Degree	IU	Month																	
			2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36
Jodie Joanna Giesz-Ramsay	Masters	3	1	2	3	3	3	3												
Total Internship Units		3																		
Total Project Funding	$ 15,000																			

2. Description of Proposed Research

Research Abstract

Many children struggle with social anxiety on a regular basis. This makes it difficult for them to interact with other kids, which may isolate them during school and play times. Often times this anxiety arises from stressful situations, including transitions between schools, new social dynamics and puberty. It would be interesting to see if there were a way to use new technologies in order to help children better cope with their social anxiety and become more involved in everyday activities.

Research would be conducted in this area to accomplish a few key things. Firstly, it would help assess the suitability of VR experiences for kids suffering from social anxiety. It would also help identify the best practices and key features required for a VR experience to be successful. Finally, it would aid in the development of an actual therapeutic media system used by children across Canada.

This project is related to Corus Entertainment because their intellectual property, in the form of television and web series characters, could be used in the development of virtual reality experiences. This could provide the company with a new revenue stream from potential licensing deals made with developers.

The research would be particular relevant to the intern, Jodie Joanna Giesz-Ramsay because of her background in childhood psychology. She previously obtained a Bachelor of Arts (Hons.) from Ryerson University in Toronto, where she took many courses related to developmental and abnormal psychology. She is also an author, who has published children's books related to the struggles of growing up in the modern world.

Background

The first academic literature example shows that video games have the potential to influence the brain by affecting the happiness and wellbeing of school-aged children. The 2016 article, written by Dr. Ian Janssen of Queen's University, is titled "Estimating Whether Replacing Time in Active Outdoor Play and Sedentary Video Games With Active Video Games Influences Youth's Mental Health." In the study, Dr. Janssen sampled 21,122 grade 6 to 10 students in Canada in order to assess the effects of replacing less physically active video games (SVGs) with more physically active video games (AVGs), as well as replacing physically active outdoor play (AOP) with physically active video games (AVGs) (Janssen, 2016, p. 1). These replacements were made in one hour per day units, and information on their feelings was collected through several anonymous questionnaires (Janssen, 2016, p. 2). In the end, it was found that children who replaced less physically active video games (SVGs) with more physically active video games (AVGs) experienced a reduction in emotional problems and an increase in both life satisfaction and sociable behaviour. (Janssen, 2016, p. 1). Additionally, children who replaced physically active outdoor play (AOP) with physically active video games (AVGs) had increased emotional problems and a reduction in both life satisfaction and sociable behaviour (Janssen, 2016, p. 1).

Another piece of academic literature shows how active video games can change previously injured parts of the brain in order to regain some normal functioning. While it does not directly have anything to do with the mental well-being of subjects, it proves that video games have the potential

to positively change brain functioning, which is closely related. The study was conducted by Ki Hun Cho, Kyoung Jin Lee and Chang Ho Song in the physiotherapy departments of several South Korean hospitals. 22 stroke patients, who had lost some balance and motor skills as a result of their condition, were selected to undergo observation during regular physiotherapy (Cho, Lee & Song, 2012, p. 69). They all received standard treatment for 60 minutes a day, 5 times a week for 6 weeks (Cho, Lee & Song, 2012, p. 69). However, half of the patients also received Virtual Reality Balance Training (VRBT) through playing Wii Sports and Fit games using a connected balance board and television for 30 minutes per day, three times per week, for six weeks (Cho, Lee & Song, 2012, p. 69). After completion, it was concluded that while standing still balance measures were almost identical for both groups, the patients receiving VRBT showed statistically significant improvements in balance while moving around (Cho, Lee & Song, 2012, p. 71).

One final piece of academic literature discusses a study done on the effect of violent video games on children who already have some mental health issues. While the article does not relate to the treatment of these issues and disorders, it considers whether or not video games can have a profound effect on the brain and cause certain outcomes in behaviour or thought patterns. It was written by Christopher Ferguson and Cheryl Olson and is titled “Video Game Violence Use Among ‘‘Vulnerable’’ Populations: The Impact of Violent Games on Delinquency and Bullying Among Children with Clinically Elevated Depression or Attention Deficit Symptoms.” In the study conducted, 377 children, who averaged 13 years of age, and each displayed significant attention deficit or depressive symptoms, were given questionnaires asking questions from a variety of different areas (Ferguson and Olson, 2013, p. 127). These included their exposure to violent video games, their family dynamic at home, behaviour when interacting with peers, delinquent behaviour and general stress level (Ferguson and Olson, 2013, p. 127). The responses were evaluated in order to see if a correlation was present between exposure to violent video games and behaviour exhibiting bullying or criminality (Ferguson and Olson, 2013, p. 127). In the end, no significant linkage was determined, leading researchers to believe that already at-risk youth did not have a greater likelihood of being influenced by virtual violent actions (Ferguson and Olson, 2013, p. 127).

General Objective

The main question to be answered through all efforts is can virtual reality games be used to help children overcome everyday social anxiety? Research would be conducted in this area to accomplish a few key things. Firstly, it would help assess the suitability of VR experiences for kids suffering from social anxiety. It would also help identify the best practices and key features required for a VR experience to be successful. Finally, it would aid in the development of an actual therapeutic media system used by children across Canada.

Details of Internships or Subprojects

Subproject 1 - Suitability

Intern Name
Jodie Joanna Giesz-Ramsay

Objective
- Assess suitability of VR to children with social anxiety

Methodologies
- Conduct secondary research into past uses of virtual reality technology, including how safe it is for children of different ages
- Interview therapists as to whether or not they feel virtual reality experiences would be beneficial and safe for use on children
- Interview psychologists and psychiatrists to gain more insight into the typical social issues children face on a regular basis

Timeline
- 2 months
    - 1 month of researching and interviewing
    - 1 month to summarize findings and write paper

Expected Deliverables
- Paper describing summary of findings
- Recommendations as to the limitations of use on children of different ages
- Insights into specific areas or VR technology that would be particularly beneficial and useful for children with social anxiety

Benefit to Intern
- Can gain a deeper insight into already studied areas of abnormal and developmental psychology
- Provides chance for networking and making professional connections through researching and interviewing

Interaction
- 30% partner interaction, 70% academic interaction
    - Greater need for information finding during early stages of the project to find information that can be used in development

Partner Interaction
- Regular meetings with project team to discuss findings and inform individuals of future goals and objectives

Subproject 2 - Best Practices

Intern Name
Jodie Joanna Giesz-Ramsay

Objective
- Discover best practices and key feature requirements

Methodologies
- Research into what different features could be used in future project areas
- Interview video game developers to discover how they use different audio and visual elements to create certain impacts on players, as well as what to avoid in the development of an experience

Timeline
- 2 months
    - 1 month of research and interviewing
    - 1 month to summarize best practices and make recommendations

Expected Deliverables
- Paper summarizing research and interview findings
- Description of various VR and game features that could be used
- List of best practices when developing a VR experience

Benefit to Intern
- Opportunity to meet new people in various industries and make professional connections
- Provides a better understanding of digital storytelling, which could be used for future literary projects to be worked on

Interaction
30% partner interaction, 70% academic interaction
    - Greater need for information finding during early stages of the project to find information that can be used during development

Partner Interaction
- Regular meetings with project team to discuss findings and come up with guidelines for future development

Subproject 3 - Experience Development

Intern Name

Jodie Joanna Giesz-Ramsay

Objective

- Develop a basic VR experience for children

Methodologies

- Meet with writers, graphic artists and developers to develop a concept for a playable VR experience
- Regularly oversee the progress made by artists and developers and make changes accordingly
- Test several iterations of VR experience, making adjustments of various elements

Timeline

- 8 months
    - 3 months on storyboarding and concept development
    - 5 months of media development

Expected Deliverables

- Full script, storyboard and description for VR experience
- Playable VR game

Benefit to Intern

- Opportunity to continue passion of storytelling for children
- Chance to better understand the multimedia development process
- Provides opportunity to develop leadership and project management skills

Interaction

- 70% partner interaction, 30% academic interaction
    - Greater focus on development of VR experience itself at Corus

Partner Interaction

- Working with in-house team of writers, graphic artists and developers to create a full VR experience for children

Relevance to Partner Organization and Canada

Corus Entertainment and has access to a wealth of intellectual property, including characters from children's shows on YTV, Teletoon and Treehouse (Corus Entertainment, 2017). This includes animated and live-action series that are currently in production today, as well as from decades past (Corus Entertainment, 2017). Many of these characters could be used in the production of virtual reality experiences and games due to the fact children are familiar with them, making activities more comfortable. This could help create goodwill in the community by adding to their 'Corus Cares' efforts in corporate social responsibility (Corus Entertainment, 2017).

Adolescent mental health is becoming a larger issue throughout Canada. The number of children who report feeling anxious or depressed has doubled over the past 30 years (Nuffield Foundation, 2012). In fact, 10% to 20% of Canadian youth experience mental health issues during their childhood (Canadian Mental Health Association, 2016). However, only 1 in 5 children who need mental health care will receive it when needed (Canadian Mental Health Association, 2012). This can be due to long wait times, regional unavailability, high costs of private therapy and a shortage of mental health practitioners (Canadian Mental Health Association, 2012). The research to be done in the project could help bring affordable, enjoyable and effective options to parents, teachers and mental health practitioners so that kids they care for can enjoy lower anxiety and improved mental health.

Project Economic Orientation

This project aims to be able to provide the framework of an effective Virtual Reality Exposure Therapy (VRET) experience, which could then be developed in partnership with Corus Entertainment for educators, healthcare professionals and the general public. The research team would receive royalties from VR experience software sales, and Corus Entertainment would receive royalties from the use of their characters in the experiences.

References

Canadian Mental Health Association. (2012, February 3). Access to Services. Retrieved from http://www.cmha.ca/public_policy/access-to-services-2/#.WCu23aIrLBJ

Canadian Mental Health Association. (2016). Fast Facts about Mental Illness. Retrieved from http://www.cmha.ca/media/fast-facts-about-mental-illness/#.WKYW9xLyvBI

Cho, K. H., Lee, K. J., & Song, C. H. (2012). Virtual-reality balance training with a video-game system improves dynamic balance in chronic stroke patients. The Tohoku Journal of Experimental Medicine, 228(1), 69-74. doi:10.1620/tjem.228.69

Corus Entertainment. (2017). Television Brands. Retrieved from http://www.corusent.com/about/our-brands/television/

Corus Entertainment. (2017). Corus Cares. Retrieved from http://www.corusent.com/corporate-social-responsibility/corus-cares/

Ferguson, C. J., & Olson, C. K. (2014;2013;). Video game violence use among “Vulnerable” populations: The impact of violent games on delinquency and bullying among children with clinically elevated depression or attention deficit symptoms. Journal of Youth and Adolescence, 43(1), 127-136. doi:10.1007/s10964-013-9986-5

Janssen, I. (2016). Estimating whether replacing time in active outdoor play and sedentary video games with active video games influences youth's mental health. Journal of Adolescent Health, doi:10.1016/j.jadohealth.2016.07.007

Nuffield Foundation. (2012, March 14). Increased levels of anxiety and depression as teenage experience changes over time. Retrieved from http://www.nuffieldfoundation.org/news/increased-levels-anxiety-and-depression-teenage-experience-changes-over-time

3. Declarations

3.1. Will the proposed research be taking place outside of the lab or normal business environment?

Yes___ No __**X**

3.2. Does the proposed research involve living human subjects (including conducting interviews) or human remains, cadavers, tissues, biological fluids, embryos, or fetuses?

Yes__**X**__ No___

If yes, the proposal must be approved by the participating University Research Ethics Board, and a valid Ethics approval is required for the duration of the research project. Access to funding may be denied for projects that do not have ethical approval. Please note: Mitacs may request a copy of the report to ensure compliance.

3.3. Does the proposed research involve animal subjects?
Yes___ No__**X**

3.4. Is a biohazards review required?
Yes___ No__**X**

3.5. Have any participants declared a Conflict of Interest (COI) as part of this application?
Yes___ No__**X**

3.6. How did the participants first hear about Mitacs?
__**X**__ From the University's Graduate Offices
__**X**__ Notification from the University or University Department

6. Suggested Reviewers

Denise Reid, University of Toronto, Department of Occupational Science and Occupational Therapy
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Neil Randall, University of Waterloo, The Games Institute
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Ian Janssen, Queen's University, Professor and Canada Research Chair in Physical Activity and Obesity
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7. MITACS Accelerate Memorandum

Title of Project

Mitigating Anxiety Through Experiential VR

Public Project Overview

The main question to be answered through all efforts is can virtual reality games be used to help children overcome everyday social anxiety? Research would be conducted in this area to accomplish a few key things. Firstly, it would help assess the suitability of VR experiences for kids suffering from social anxiety. It would also help identify the best practices and key features required for a VR experience to be successful. Finally, it would aid in the development of an actual therapeutic media system used by children across Canada.

Appendix A

Academic Discipline
Sciences, Social Sciences, Arts and Humanities

Project Priority Sectors
- Entertainment and media
- Health and related sciences and technologies
- New and digital media

Participants
Corus Entertainment

Legal Status
- For profit private Canadian corporation

Partner Size (No. of employees)
- 500 and higher

Interns Identified
Jodie Joanna Giesz-Ramsay

Citizenship
- Canadian

Gender
- female