MSC2004H - Research Methods

Assignment 1: Search strategy, bibliography, and media audit

Brief Description

Project Significance & Visual Problem:
Healthcare establishments that nurture a culture of equity, diversity and inclusion (EDI) are known to provide better patient care and experience decreased health disparities (Morrison, 2021). These improved patient outcomes can likely be attributed to stronger patient-caregiver relationships fostered by empathetic behaviours and a greater understanding of the inequities faced by marginalized communities. Despite mounting evidence highlighting the benefits of empathetic care, there is a lack of education focused on developing these skills (Moudatsou et al., 2020). Currently, there is a need for creative and interactive teaching mediums in the teaching of empathy amongst healthcare practitioners (Moudatsou et al., 2020). Many studies suggest that the use of simulations, especially ones that simulate the patient experience, improves empathy learning (Bearman et al., 2015). To address this, we plan to create a 2D visual narrative game that places the user within the shoes of a marginalized individual seeking care in the emergency room (ER) of a hospital. This immersive experience is intended to build empathy and provide users with an inside look at how unconscious discrimination and bias can affect patient-health professional relationships and health outcomes. The game aims to explore some of the barriers that both patients and nurse practitioners face to validate the experiences from both sides and build mutual empathy.

Design Question:
Can a 2D visual narrative game be used to create an immersive and safe environment in which the user can: 1) role-play as either the patient or healthcare provider to learn about EDI barriers faced by both sides and 2) through emotional engagement with the content, develop, rehearse and reinforce empathic behaviours that improve patient care/outcomes?

Proposed Target Audience:
General public, healthcare workers and medical students.

Proposed Format:
2D visual narrative video game.

Project Objectives:
1. Create an authentic and engaging game experience through effective storytelling and immersive game and sound design.

2. Induce an emotional response in the user that leads to the development of actionable empathy towards minority groups who face discrimination and bias in the healthcare system to enhance patient-centered care.
3. Introduce the user to key barriers faced by ER nurses that hinder them from creating a safe environment for minority group patients seeking care at the ER.
4. Provide the user with a foundation of language to be able to recognize and address any witnessed displays of inequity.

Search Strategy

Table 1: Relevant Keywords by Category

Content	Audience	Medium
Equity	Nurse	"Video game*" OR Videogame*
Diversity	"nurs* student"	Game*
Inclusi* (inclusion or inclusivity)	(Health?care OR healthcare) AND (worker OR practitioner OR student)	"virtual reality" OR VR
EDI OR DEI	HCW	Simulat*
Empath*	"med* student"	Role?playing
Emerg* AND (department OR room)	Resident	Gamifi* (gamification or gamified)
ER	Patient	Immersi* (immersive or immersion)
Curricul* (curriculum or curricula)	"people with lived experience" OR "PWLE"	"Game design"
Edu* (education or educate)	Marginaliz*	"Serious game*"
Train*		"Persuasive game*"
Learn*		
Teach*		

Table 2: Search Strategy for Research Questions

Questions	Queries	Databases
How are topics of EDI typically taught to healthcare workers and medical students? How effective are these methods?	(effective* OR feasib*) AND (teach* OR train* OR edu* OR learn*) AND (strateg* OR approach* OR method*) AND (equity OR diversity OR inclusi* OR EDI OR DEI) AND (nurse OR "nurs* student" OR ((health?care OR healthcare) AND (worker OR practitioner OR student)) OR HCW OR "med* student" OR resident)	Web of Science, ERIC, PsychINFO, Google Scholar
What novel approaches to teaching EDI have been explored? How effective are these methods?	(effective* OR feasib*) AND (novel OR new OR innovative) AND (teach* OR train* OR edu* OR learn*) AND (strateg* OR approach* OR method*) AND (equity OR diversity OR inclusi* OR EDI OR DEI)	Web of Science, ERIC, PsychINFO, Google Scholar
How is knowledge/understanding of EDI topics or empathic behaviour evaluated in students?	(evaluat* OR assess* OR test OR measure*) AND (knowledge OR understanding) AND (equity OR diversity OR inclusi* OR EDI OR DEI OR empath*)	Web of Science, ERIC, PsychINFO, Google Scholar
How have video games been used to develop empathy? Were these attempts successful?	(game OR "VR" OR "virtual reality" OR simulat* OR role?playing) AND empath* AND (teach* OR train* OR edu* OR learn*)	Web of Science, ERIC, PsychINFO, Google Scholar
How have video games been used to teach topics of empathy, equity, diversity or inclusion to healthcare professionals?	(game OR "VR" OR "virtual reality" OR simulat*) AND empath* AND (education OR train*) AND ("EDI" OR equity OR diversity OR inclusi*) AND (nurse OR "HCW" OR "healthcare worker" OR "medical student" OR clinician OR doctor)	Web of Science, ERIC, PsychINFO, Google Scholar
How can video games be used to build empathy regarding the experiences of patients in the emergency room?	(game OR "VR" OR "virtual reality" OR simulat*) AND empath* AND (patient OR "people with lived experience" OR "PWLE") AND ("ER" OR "emergency room" OR emerg*)	Web of Science, ERIC, PsychINFO, Google Scholar
What are some ways in which immersion can be created through game design?	(immersive or immersion) AND (principle OR tool OR tip OR strateg* OR guide) AND ("game design" OR	Web of Science, Google Scholar

	game)	
How effective is gamification in engagement and teaching more abstract concepts in science?	("Persuasive game*" OR "Serious game*" OR Gamifi*) and (Edu* OR Curricul* OR Train* OR Learn* OR Teach*)	Web of Science, Google Scholar

Annotated Bibliography

Reference Categories:

✦ = Video games/VR/simulation/role-playing

✦ = Teaching empathy

✦ = Healthcare education

✦ = Equity, diversity and/or inclusion

1. Designing a Virtual Reality Game for Promoting Empathy Toward Patients With Chronic Pain: Feasibility and Usability Study	
Reference Categories	✦ ✦
Citation	Tong, X., Gromala, D., Kiaei Ziabari, S. P., & Shaw, C. D. (2020). Designing a Virtual Reality Game for Promoting Empathy Toward Patients With Chronic Pain: Feasibility and Usability Study. *JMIR Serious Games, 8*(3), e17354–e17354. https://doi.org/10.2196/17354
Purpose	The authors of this paper previously developed a non-VR game called *AS IF* that was designed to increase people's empathy towards those living with long-term chronic pain. In this paper, they redesigned their game to create a VR prototype version that they tested on participants to determine the effectiveness of their approach in promoting empathy.
Results & Conclusions	◇ Participants showed an increase in kindness and willingness to help scores after playing the game ◇ 75% of the participants could relate the avatar to themselves to some degree when playing the game ◇ Red flashes were used to signal pain and elicited some sense of pain in most of the participants (synesthesia) ◇ The use of narrative (inner monologue audio) and game tasks strengthened the participants' sense of immersion
Limitations	◇ Small number of participants (n = 18) and no control group

	◇ Only theoretical empathy was tested for and long-term empathy behavioral changes were not measured
Takeaways	◇ The use of inner monologue audio greatly improved the user's sense of immersion ➜ Supports our idea of including an inner monologue and immersive audio in our game design ◇ Some participants interpreted the limited motion of the avatar as a glitch in the game versus a result of the pain signal ➜ Gameplay cues must be clear to avoid confusion and misdirected frustration in the player
Other Notes	◇ "...two experiential aspects of VR—an immersive sense and an embodied sense—appear to play important roles in empathy"

2. Impact of the Geriatric Medication Game® on nursing students' empathy and attitudes toward older adults	
Reference Categories	✦ ✦ ✦
Citation	Chen, A. M. H., Kiersma, M. E., Yehle, K. S., & Plake, K. S. (2015). Impact of the Geriatric Medication Game® on nursing students' empathy and attitudes toward older adults. *Nurse Education Today, 35*(1), 38–43. https://doi.org/10.1016/j.nedt.2014.05.005
Purpose	The study examines the impacts of participation in a 3-hour role-playing aging simulation game on nursing students' empathy and attitudes toward older adults.
Results & Conclusions	◇ Participants showed significantly greater empathy towards older adults after playing the game (higher scores and improved answers for 7/13 questions) ◇ Students experienced impatience and frustration while playing the game which are commonly felt emotions by geriatric patients ◇ Students felt they better understood challenges faced by older adults within the healthcare system
Limitations	◇ Small sampling size (n=58) ◇ Participants were nursing students taking a course on geriatric care and therefore may have a greater baseline empathy for older adults than is common ◇ No assessments of long-term attitudes or whether the results translate to improved patient care
Takeaways	◇ Role-playing games can be just as successful as VR games in

	building empathy in the user ➜ VR is not necessary to achieve the results we want ◇ Feelings of frustration and impatience in the user can contribute to a better understanding of barriers faced by the simulated group ➜ Feelings we plan on inducing in our users as well

3. Neural correlates of video game empathy training in adolescents: a randomized trial	
Reference Categories	✦ ✦
Citation	Kral, T. R. A., Stodola, D. E., Birn, R. M., Mumford, J. A., Solis, E., Flook, L., Patsenko, E. G., Anderson, C. G., Steinkuehler, C., & Davidson, R. J. (2018). Neural correlates of video game empathy training in adolescents: a randomized trial. *NPJ Science of Learning, 3*(1), 13–10. https://doi.org/10.1038/s41539-018-0029-6
Purpose	A study evaluating whether a video game designed with empathy-training mechanics (*Crystals of Kaydor*) could be used to improve adolescents' empathic accuracy and increase empathy-related brain activation and connectivity.
Results & Conclusions	◇ There was no statistically significant changes in groups scores for empathic accuracy after gameplay or between the test and control groups ◇ Compared to the control group, the Crystals groups showed increased neural activation and connectivity in regions of the brain associated with empathy processing ◇ Individuals within the Crystals group with increased empathic accuracy scores after gameplay displayed increased connectivity in brain circuits relevant for emotion regulation ◇ 6 hours of gameplay was sufficient in producing behaviorally-relevant functional neural changes associated with empathic behavior in adolescents
Limitations	◇ The relatively low level of difficulty in gameplay may have impacted the results of the study ◇ Could not access and analyze engagement data for the commercial video game played by the control group
Takeaways	◇ Empathy training through 2D video gameplay can result in neurological changes in regions of the brain associated with empathic behaviour ◇ Empathy training can be encoded into gameplay by requiring the user to accurately interpret and respond to the emotions of non-player characters (NPCs) in the game ➜ We can apply

	facial expressions and body language to the design of NPCs in our game and create teachable moments from these interactions that the player can review at the end of the game

4. Depression Prevention by Mutual Empathy Training: Using Virtual Reality as a Tool	
Reference Categories	✦ ✦
Citation	Li, Y., & Luo, H. (2021). Depression Prevention by Mutual Empathy Training: Using Virtual Reality as a Tool. *2021 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, 60–63. https://doi.org/10.1109/VRW52623.2021.00017
Purpose	This study describes the development of a prototype VR game (Schwer) designed to establish cognitive empathy and mutual understanding of depressive disorders in both patients and caregivers.
Results & Conclusions	◇ A prototype game was developed based on input and playtesting feedback from design experts and patients living with depression ◇ The game flow was designed to training cognitive behaviour in an upward spiral that extends to real life behavioural changes ◇ Participants expressed a gained understanding of the mental world of depression and showed interest in participating in future experiments
Limitations	◇ Unable to complete the in-person testing component of the study as planned due to the pandemic

Takeaways	◇ The publication was unable to complete the testing phase but describes design choice of the game ➜ Can be referenced for the methods section of our proposal
	◇ Game mechanisms reflect reality in terms of the figures, interactions and implications of behaviours/choices made ➜ Goal of making actionable lessons from the game that change real life behaviours and attitudes
	    ◇ NPCs reflect real figures in the life of someone living with depression: friends/family as represented by The Sage, professional support represented by The Wise, people who are unempathetic represented by The Fool
	    ◇ Interacting with supportive NPCs progresses the game forward while interacting with The Fool inhibits progress ➜ Positive reinforcements in the game train

	the user to adapt healthy behaviors like talking about their mental health with their support system

5. Feasibility of a Computer Role-Playing Game to Promote Empathy in Nursing Students: The Role of Immersiveness and Perspective	
Reference Categories	✦ ✦ ✦
Citation	Ma, Z., Huang, K., & Yao, L. (2021). Feasibility of a Computer Role-Playing Game to Promote Empathy in Nursing Students: The Role of Immersiveness and Perspective. *Cyberpsychology, Behavior and Social Networking, 24*(11), 75–755. https://doi.org/10.1089/cyber.2020.0371
Purpose	The study evaluates how the variables of game immersiveness (VR vs non-VR) and character perspective (patient family vs healthcare provider) affect nursing students' level of empathy. A chapter from the CRPG game *That Dragon, Cancer* was used for the study.
Results & Conclusions	◇ Immersiveness of the game was directly proportional to the user's empathy and spatial awareness but not on their perception of agency ◇ Nursing students showed greater empathy towards the healthcare provider NPCs than the patients' family NPCs in the non-VR condition but the difference became negligible in the VR condition
Limitations	◇ Small sampling group (n = 69 divided amongst 4 conditions) ◇ Did not establish participant baselines (pretest empathy levels or past VR gaming experiences) or measure clinical empathy scores ◇ Inconsistent non-VR controls (both iPads and laptops were used) ◇ Study involves a total of 10 minutes of gameplay extracted from halfway through the complete playthrough of the original game which changes the emotional context and weight of the scene
Takeaways	◇ Increased sense of game immersion can flatten the differences caused by a different perspectives ➜ Since our game is targeted at the general public who may not identify closely with the avatar they are playing, it'll be critical to overcome this barrier through a highly immersive experience

6. The Role of Empathy in Health and Social Care Professionals	
Reference Categories	✦ ✦ ✦
Citation	Moudatsou, M., Stavropoulou, A., Philalithis, A., & Koukouli, S. (2020). The Role of Empathy in Health and Social Care Professionals. *Healthcare (Basel), 8*(1), 26–. https://doi.org/10.3390/healthcare8010026
Purpose	A literature review that defines empathy and explores its dimensions, role, tools for its assessment, and factors that influence its presence in the healthcare field.
Results & Conclusions	◇ Empathy is multidimensional, consisting of affective (emotional), cognitive and behavioural (practical) aspects that altogether contribute to the level patient care ◇ An empathetic caregiver-patient relationship has been shown in many studies to greatly improve health outcomes and patient satisfaction ◇ Mutual benefits are experienced; the patient emotional state directly impacts the caregivers emotional state which is why physicians who have higher levels of empathy experience less burnout and depression ◇ The Jefferson Scale of Empathy (JSE) is the most widely used tool to measure empathy in healthcare professionals and students ◇ Empathy in caregivers is greatly limited by stress, burnout, emotional fatigue, time pressures, lack of training in empathy, lack of self-awareness, fears of boundary violations, etc. ◇ Consensus amongst students and professionals that education is critical for the reinforcement of empathetic skills ◇ Educational program on empathy should involve hands-on work, multimedia use, role-playing or experiential learning
Limitations	◇ Limited to studies from the last 15 years and published in English or Greek
Takeaways	◇ There are plenty of studies proving the benefits of empathetic care but a lack of education focused on developing empathetic skills ➜ Supports the significance and need for our project ◇ Creative and experiential teaching methods for empathy are recommended ➜ Supports our choice of medium

7. Learning Empathy Through Simulation: A Systematic Literature Review	
Reference Categories	✦ ✦ ✦
Citation	Bearman, M., Palermo, C., Allen, L. M., & Williams, B. (2015). Learning Empathy Through Simulation: A Systematic Literature Review. *Simulation in Healthcare : Journal of the Society for Medical Simulation, 10*(5), 308–319. https://doi.org/10.1097/SIH.0000000000000113
Purpose	A literature review assessing whether simulation-based education (including games, simulated patients, and roleplay), in comparison to alternative teachings or a lack of education, help develop empathy and empathetic behaviours in preservice health professional students. The paper also explores whether any specific strategies/approaches result in improved learning outcomes.
Results & Conclusions	◇ Findings suggest that simulations as an appropriate method for teaching empathy to healthcare students and that there is added value in the student taking on the patient perspective ◇ Amongst the papers, 2 thematic mechanisms appeared to promote learning: 1) simulating a health professional and/or 2) simulating a patient 　　◇ 37% of the studies involved simulating both roles 　　◇ Type of empathy measure, type of comparator, length of intervention and content of simulation did not appear to impact learning outcomes ◇ Comparative studies show that role-playing exercises have comparable or improved results when compared to simulated patient exercises ◇ Debriefing may be important for helping students translate their learning experiences to improved communication skills
Limitations	◇ Limited to articles in English, peer reviewed and with fulltext availability 　　◇ A total of 27 studies where included in the final review ◇ Contains very few qualitative studies as many of these were not framed as comparative studies
Takeaways	◇ The study suggests that our decision to place the user in the shoes of both the patient and health profession may promote greater empathy learning ◇ The patient perspective in our game adds additional learning value to our game for health professional students ◇ Walking users through their game experiences at the end of

	each playthrough will be important for translating the learning to actionable skills

8. Diversity, Equity, and Inclusion in Nursing: The Pathway to Excellence Framework Alignment	
Reference Categories	✦ ✦
Citation	Morrison, V., Hauch, R. R., Perez, E., Bates, M., Sepe, P., & Dans, M. (2021). Diversity, equity, and inclusion in nursing: The pathway to excellence framework alignment. Nursing Administration Quarterly, 45(4), 311–323. https://doi.org/10.1097/NAQ.0000000000000494
Purpose	A literature review conducted to assess whether healthcare organizations that implement DEI strategies have improved outcomes and how the *American Nurses Credentialing Center Pathway to Excellence® Designation Program* framework supports DEI initiatives.
Results & Conclusions	◇ Minority groups face disproportionate rates of certain health conditions and specific interventions by healthcare organizations have the potential to significantly reduce poor health outcomes in these communities ◇ The *Pathway to Excellence* framework encompasses 6 evidence-based standards that are essential to creating a positive practice environment and is founded on protocols/standards around DEI ◇ One meta-analysis (n=16) found that increasing diversity in the health care workforce led to improved quality of care, financial performance, innovation, team communication and decreased health disparities ◇ A second meta-analysis (n=30) found that the promotion of DEI was consistently associated with positive outcomes and a climate of inclusion ◇ An organization can improve DEI through its commitment, culture and use of structural empowerment ◇ A culture of DEI supports both staff and patients
Limitations	◇ Limited number of articles with strong evidence
Takeaways	◇ A culture of DEI leads to improved workplace outcomes for the organization, patients and staff ➜ Supports significance and need for DEI in the healthcare field

9. Developing young children's empathic perception through digitally mediated interpersonal experience: Principles for a hybrid design of empathy games	
Reference Categories	✦ ✦
Citation	Wu, L., Kim, M., & Markauskaite, L. (2020). Developing young children's empathic perception through digitally mediated interpersonal experience: Principles for a hybrid design of empathy games. *British Journal of Educational Technology, 51*(4), 1168–1187. https://doi.org/10.1111/bjet.12918
Purpose	This paper developed theory-informed design principles for promoting empathetic perception through a tablet game. A game called *Empathy World* was then created based on these principles and evaluated in an early childhood education setting.
Results & Conclusions	◇ The results from the study support the use of the theory and evidence-informed design principles discussed in the article for use in empathy training game design
Limitations	◇ The paper looked at design principles targeting early empathic learning in children, although, some of the principles discussed are still applicable to empathy training more broadly ◇ Further study is needed to better understand how learning through hybridized game design translates into behaviour/emotions in real-life social situations
Takeaways	◇ Applicable design principles: 　◇ Core design should focus on empathic perception + provide learning opportunities to perceive and pay attention to others in social situations 　◇ Game should design perceptual stimuli that successfully blends digital representations with real-life experiences while suggesting appropriate action in that situation 　◇ Game should progress with progressing complexity so user can develop selective attention and build upon skills learned when in a new situation

10. Teaching Empathy to Medical Students: An Updated, Systematic Review	
Reference Categories	✦ ✦
Citation	Batt-Rawden, S. A., Chisolm, M. S., Anton, B., & Flickinger, T. E. (2013). Teaching Empathy to Medical Students: An Updated, Systematic

	Review. *Academic Medicine, 88*(8), 1171–1177. https://doi.org/10.1097/ACM.0b013e318299f3e3
Purpose	A systematic review of literature on evaluated empathy training interventions in undergraduate medical school that looks at what new interventions have been implemented since 2003 to build empathy, how has the effectiveness of these interventions been measured and the quality of evidence for each intervention.
Results & Conclusions	◇ Studies on communication skills training interventions suggest that empathy is a skill that can be modified by educational strategies ◇ Studies on patient narrative and creative arts interventions saw a significant increase in empathy scores after allowing students to see the patient's perspective. ◇ Empathy training leads to better patient care and outcomes and educational interventions work ◇ Educators should consider building upon relationship-centered care to encourage empathy ◇ Empathic skills developed through point-of-view writing does not necessarily translate into appropriate behaviour/actions in real-world situations ◇ Empathy training with exposure to patients and the clinical environment can affect empathy
Limitations	◇ 18 articles were included, limited to those in written in English (15 quantitative and 3 qualitative studies) ◇ More longitudinal studies needed better understand how successfully integrate such curriculum in medical education
Takeaways	◇ Reinforces that empathy is a skill that can be developed and including the patient perspective builds empathy ◇ Should consider touching on factors behind a decline in empathy including stress, fatigue, the perceived need for detachment, unstable learning environment, "hidden curriculum" in medical education, loss of idealism, etc. ◇ Highlighted importance of role models and reciprocal nature of empathy training ➜ Enforces our idea of including dual perspectives within our game

11. Breaking the Magic Circle: Using a Persuasive Game to Build Empathy For Nursing Staff and Increase Citizen Responsibility During a Pandemic

Reference Categories	✦ ✦ ✦
Citation	Holliday, Emma. (2021). Breaking the magic circle: using a persuasive

	game to build empathy for nursing staff and increase citizen responsibility during a pandemic. Extended Abstracts of the 2021 Annual Symposium on Computer-Human Interaction in Play. Association for Computing Machinery, New York, NY, USA, 339–344. https://doi.org/10.1145/3450337.3483511
Purpose	This paper looks at the effectiveness and development of a video game aimed at encouraging empathy towards the experiences of healthcare staff during the pandemic and how external factors (e.g., understaffing) affect their ability to provide care.
Results & Conclusions	◇ It is possible to use serious/persuasive games to promote changes in attitude regarding blame culture, as well as increasing empathy towards nursing staff ◇ Participant attitudes, became more aligned to the game's message immediately after playing the game ◇ Technique of breaking the "magic circle" (the idea that the game exists in a temporary world where only the rules of the game apply) by asking players to involve their real-world actions in gameplay was effective in encouraging reflection of actions and engaging + invoking an emotional response
Limitations	◇ Game had to be kept to a small scale due to time restraints, user study was also small scale (n=11) ◇ No evaluation comparing the effectiveness of this game compared to other media covering same content ◇ Game was not tested formally with medical staff and nurses to ensure it was an accurate representation of their experience at work
Takeaways	◇ Used low-fidelity art style to encourage greater focus on actions taking place ➜ Will strategically select drawings in game to include more/less detail on depending on our intention on where we should guide the users' attention ◇ Sound was used to build tension through choice of music + increasing music volume (increased sense of intensity) ◇ For nurse story, having real-time events vs. turn based provided a more realistic simulation as didn't have luxury to pause time and think for a long time ◇ Important for usability that the player obtains complete knowledge of the mechanics/controls ➜ Could be completed through intergrated/more subtle tutorial in beginning ◇ Should consider what would encourage users to share the game ➜ If users are more likely to share the game, it will allow the message of the game to spread

12. A Storytelling Game to Foster Empathy and Connect Emotionally with Breast Cancer Journeys	
Reference Categories	✦ ✦ ✦
Citation	De Araujo Luz Junior, J., Rodrigues, M. A. F., & Hammer, J. (2021). A Storytelling Game to Foster Empathy and Connect Emotionally with Breast Cancer Journeys. *2021 IEEE 9th International Conference on Serious Games and Applications for Health(SeGAH)*, 1–8. https://doi.org/10.1109/SEGAH52098.2021.9551860
Purpose	This paper evaluated a prototype of a 3D narrative game based on real-world stories to connect people emotionally with breast cancer journeys to build empathy.
Results & Conclusions	◇ An empathetic and emotional response (e.g. tears welling up in their eyes) was recorded from the players as a result of the experience/story told through the game ◇ Most playtesters were successfully able to distinguish different emotions felt by the patient character
Limitations	◇ Limited number of participants in playtesting study (n=18) ◇ More playtesting required to evaluate effectiveness of 3D human models and the boundary between fostering stronger emotional connections or risking the Uncanny Valley effect
Takeaways	◇ In framework of game, planned different events w/ various possible choices including personal conflicts/doubts ◇ Players actions are reflected in both the narrative (order of events) and character's animation ◇ Important to consider how to guide the player's attention ◇ Meaningful choices in the game brings a human element into the story (transforms play into roleplay) ◇ A great deal of effort was put into developing various facial expressions for each character ➜ Several participants said they had a tougher time connecting emotionally with the doctor who did not have polished facial expressions ◇ Through playtesting, suggestions were made to use the soundtrack to shape what was visually seen (to reinforce dramatic developments + emotional reactions)

13. Investigating the relation between self assessment and patients' assessments of physicians-in-training empathy: a multicentric, observational, cross sectional study in three teaching hospitals in Brazil	
Reference Categories	✦ ✦

Citation	Bernardo, M. O., Cecilio-Fernandes, D., Lima, A. R. de A., Silva, J. F., Ceccato, H. D., Costa, M. J., & de Carvalho-Filho, M. A. (2019). Investigating the relation between self-assessment and patients' assessments of physicians-in-training empathy: a multicentric, observational, cross-sectional study in three teaching hospitals in Brazil. *BMJ Open, 9*(6), e029356–e029356. https://doi.org/10.1136/bmjopen-2019-029356
Purpose	To investigate the relationship between empathy self-assessment by physicians in training and empathy levels perceived by their patients in a real clinical environment.
Results & Conclusions	◇ The self-assessment of empathy by residents did not correlate with the patient's assessments ◇ Self-assessment may stimulate awareness and motivation to change but patient assessment of empathy is critical in improving actual care and evaluate effectiveness of educational interventions
Limitations	◇ The study did not take into account other factors that may have interfered with patient's experiences (e.g. time spent in consultation or waiting room) in their assessment ◇ Study evaluated empathy using 4 well-known empathy scales but the reliability of these scales is debatable as assessment of empathy is subjective ◇ Difference in perceived empathy could be a result because the patient's assessments were measuring different components of empathy vs. the resident's self-assessment
Takeaways	◇ The importance of including patient perspectives to foster empathy in physicians and to improve actual care in the workplace which is the ultimate goal of medical education ◇ The importance of role-modelling (seeing medical educators pratice empathy in their work benefits students) ◇ Important to consider how to encourage putting theory into practice / knowing how to behave doesn't always translate to a change of behavious in practice (intention vs. action) ➔ So what are some strategies to encourage application of knowledge gained in real-life situations?

14. Gamification: Implications for Curricular Design	
Reference Categories	✦ ✦
Citation	Yunyongying, P. (2014). Gamification: Implications for Curricular

	Design. *Journal of Graduate Medical Education, 6*(3), 410–412. https://doi.org/10.4300/JGME-D-13-00406.1
Purpose	A perspectives article on the applications of gamification (incorporating aspects of video games) in curriculum design with specific connections to medical education.

Results & Conclusions	◇ Gamification includes 3 main elements:
	    ◇ Abstraction - simplifies real-world scenarios into a series of challenges that allows players to concentrate on learning specific skills sequentially to build up their skills + gradually increase in complexity
	    ◇ Game Mechanics - the development of set of feedback loops that controls a player's progression towards the completion of the objective (e.g. player receives positive/negative feedback on skill being mastered before progressing onto the next level)
	    ◇ Game Interface - designed to encourage participation and engagement with content of game
	◇ The various levels to which these elements are used within the game design influences its effectiveness

Limitations	◇ Applications of gamification as well as the variable integration of it's 3 main elements in certain contexts (e.g. empathy training) needs to be more thoroughly researched ◇ Limited number of examples of gamification in medical education were discussed in this article (not comprehensive)
Takeaways	◇ Gamification has great potential in retaining patient safety in medical training, limiting burnout in learners and working towards more competency-based medical education ◇ Consider integrating the 3 elements of gamification (abstraction, game mechanics and interface)

15. Empathy in general practice—the gap between wishes and reality: comparing the views of patients and physician	
Reference Categories	✦ ✦
Citation	Derksen, F. A. W. M., Hartman, T. O., Bensing, J., & Lagro-Janssen, A. (2018). Empathy in general practice-the gap between wishes and reality: comparing the views of patients and physicians. *Family Practice, 35*(2), 203–208. https://doi.org/10.1093/fampra/cmx080
Purpose	This paper explores the gap between the expectations of receiving empathy as a patient and the intentions of the general practitioners

	(GP) in being able to offer empathy.
Results & Conclusions	◇ Both patients and GPs recognize a gap between what they wish for and what they actually encounter in practice regarding empathy ◇ Perceived obstacles in being able to receive and offer empathy include: circumstances related to practice organization, patient-GP communication/connectedness, differences in expectations, time pressures and the GP's own capability to offer empathy ◇ Generally, GPs want to demonstrate empathy but there are many obstacles and other factors (e.g. the GPs own wellbeing) that influences this behaviour
Limitations	◇ Recruitment to ensure more diversity within the focus group was only "party successful" (most participants were female and with a high level of education) ◇ Recruitment and interviews were conducted in the Netherlands - differences in healthcare system and medical school curriculum based on geography should be considered
Takeaways	◇ Crucial for healthcare professionals to demonstrate empathy in their daily practices as patients often experience a lack of empathy leading to them feeling upset and overwhelmed ➔ Confirms the importance of building empathy in medical students ◇ Patients in study emphasized how non-empathic reception staff can make them feel unwelcomed ➔ Can include in game ◇ In the end, it is up to the GP to take responsibility in practicing empathetic communication/behaviour towards patients ➔ Important to target medical students

16. QUALITATIVE ASSESSMENT OF A NOVEL EQUITY, DIVERSITY AND INCLUSION (EDI) CURRICULUM FOR PEDIATRIC RESIDENTS	
Reference Categories	✦ ✦ ✦
Citation	Gilliam, C. A., Rooholamini, S., McPhillips, H., Mullett, T., Homer, P., McDade, J., Olszewski, A., Willgerodt, M., Kunze-Garcia, S., & Grow, H. M. (2020). 88. QUALITATIVE ASSESSMENT OF A NOVEL EQUITY, DIVERSITY AND INCLUSION (EDI) CURRICULUM FOR PEDIATRIC RESIDENTS. *Academic Pediatrics, 20*(7), e41–e42. https://doi.org/10.1016/j.acap.2020.06.109
Purpose	This paper evaluated the impact of a formal equity, diversity and inclusion (EDI) curriculum implemented in a pediatric residency

	program following a needs assessment. The residents' self-perceived knowledge, attitudes and behaviours when delivering care to diverse patient populations were evaluated through qualitative structured focus groups.
Results & Conclusions	◇ Residents reported increased awareness and improved skills when providing care to diverse populations after implementation of curriculum ◇ EDI curriculum provided students with the proper language to recognize and address any witnessed inequities
Limitations	◇ Small sample size (n=13) consisting of residents ◇ EDI curriculum that was evaluated was only implemented in pediatric residency program
Takeaways	◇ Learning goal for curriculum in our game can also to be to provide users with the proper language to be able to recognize and address any witnessed displays of inequity as this would be an important takeaway lesson

17. Trauma-Informed Care and Cultural Humility in the Mental Health Care of People From Minoritized Communities	
Reference Categories	✦ ✦ ✦
Citation	Ranjbar, N., Erb, M., Mohammad, O., & Moreno, F. A. (2020). Trauma-informed care and cultural humility in the mental health care of people from minoritized communities. *Focus*, 18(1), 8–15. https://doi.org/10.1176/appi.focus.20190027
Purpose	This article explores the principles of trauma-informed care and how adopting a cultural humility approach to patient interactions can be beneficial in a clinical setting.

Results & Conclusions	◇ Trauma-informed care:
	    ◇ Important in facilitating healing through providing a sense of agency/control and leveraging the strengths of the patient - encourages empowerment, collaboration, choice, safety, etc.
	    ◇ Is recommended as the standard of care regardless if care providers know whether a patient has a trauma history or not
	◇ Cultural humility - the understanding that cultural experience is something that one cannot fully understand but can seek to appreciate and respect
	    ◇ Traumatic events can be embedded within a cultural

	context/identity and can result in serious mental/physical health consequences ◇ Practicing this approach can foster respectful partnerships and institutional accountability
Takeaways	◇ Incorporate principles of trauma-informed care as well as cultural humility to model appropriate behaviours/actions in a clinical setting for medical students ◇ Possibly include a space for users to self-reflect on their own culture + implicit biases b/c self-awareness is important

18. Diversity and Inclusion in Psychiatry: The Pursuit of Health Equity	
Reference Categories	✦ ✦ ✦
Citation	Moreno, F. A., & Chhatwal, J. (2020). Diversity and inclusion in psychiatry: the pursuit of health equity. *Focus*, 18(1), 2–7. https://doi.org/10.1176/appi.focus.20190029
Purpose	This article discusses important aspects of diversity and inclusion in regards to mental health in medicine and their potential impact on interactions with various patients.
Results & Conclusions	◇ Culture - influences how health information is received, what is considered a health problem, how symptoms are expressed, what treatments should be offered and by whom ◇ Use of professional interpreters can greatly improve patient experience + their understanding of their treatment ◇ Microaggressions experienced by patients from healthcare professionals is a significant source of stress
Takeaways	◇ Need to complete thorough research on cultures of people (patients) we include in the game ◇ Perhaps invite user to reflect on own biases so can recognize and realign attitudes towards one of more awareness ◇ Can have patient experience include microaggressions in story framework with inner monologue to convey feelings

19. Training Medical Students in Empathic Communication	
Reference Categories	✦ ✦
Citation	Bayne, H. (2011) Training Medical Students in Empathic Communication, *The Journal for Specialists in Group Work*, 36:4, 316-329, https://doi.org/10.1080/01933922.2011.613899

Purpose	This paper evaluates an exploratory empathy training intervention for 3rd-year medical students and identifies areas for improvement in these types of programs.
Results & Conclusions	◇ After the empathy development program, students improved significantly in their Consultation and Relational Empathy scale scores which suggests a positive impact of training on the students' development of empathy ◇ Role-play scenarios in training provided students with a safe learning environment to practice empathic behaviours
Limitations	◇ Small sample size (n=11) of specifically 3rd med students ◇ Biases of standardized patients used in training could have influenced the assessments of each participant ◇ Longitudinal studies are suggested to look at the effects of empathy training over a longer period of time
Takeaways	◇ Should consider validating current barriers faced by healthcare professionals in regards to capacity for empathy but also enforce that it is their responsibility at the end ◇ Hosted sessions w/ increasing difficulty of interactions with patients w/ reflection after each session - provided students with opportunity to reflect + build upon skills progressively ➔ including stories w/ progressively tougher interactions ◇ Consistent theme is that students benefit greatly from seeing a role model present the appropriate behaviours ➔ have a review summary with correct action being modeled ◇ Important to establish credibility of content so it has value

Media Audit

1. Adventure Down Hidden Depths by Willow Yang	
Type of Medium	Visual novel
Purpose	A gamified self-directed ADHD coaching tool for young adults
Target Audience	Young adults with ADHD
Strengths	◇ Effective integration of lesson content into storyline ◇ Content was verified by licensed psychiatrist specializing in ADHD ◇ Art and audio to enhance player experience/enjoyment ◇ In-game journal feature so user can review lesson info at a glance ◇ Format allows users to go through material at their own pace

Weaknesses	◇ Player choice/interaction is limited to dialogue choices through clicking on text box, user can not interact with environment
Notes	◇ Planned the initial outline in Twine, created novel using Ren'Py
Link	https://willowdesign.github.io/portfolio/adventDHD.html

2. That Dragon, Cancer by Numinous Games	
Type of Medium	Narrative 3D video game
Purpose	An immersive, narrative videogame that retells Joel Green's 4-year fight against cancer through about two hours of poetic, imaginative gameplay that explores themes of faith, hope and love.
Target Audience	General public
Strengths	◇ Immersive sound design, and emotional voice acting paired with subtitles integrated into scene with appropriate font choice ◇ Use of imagery/symbolism + takes into account how state of mind effects perception in design of scene/visuals/narrative ◇ Integration of different game mechanics and game styles to tell different chapters of story (Joel's fight with dragon as platformer)
Weaknesses	◇ Some confusion on how to progress story because next course of action/gameplay mechanic is not clear (lack of context clues) ◇ User can not make choices in-game, just progress through story (i.e. a walking simulator), user interaction/choice doesn't contribute to immersion or influence story
Notes	◇ For the Green family's journey/experience, religion played an important role and therefore, was a continuous theme during the second half of the game. According to reviews from various people who were not religious themselves or followed a different religion, this made the second half of the game more difficult to relate to and therefore they did not experience the same emotional connection to the story content as in the first half.
Link	https://store.steampowered.com/app/419460/That_Dragon_Cancer/

3. Emergency Room: Life + Death at VGH	
Type of Medium	Docuseries
Purpose	A documentary series that follows the daily challenges faced by the

	medical team working in British Columbia's busiest emergency department.
Target Audience	General public
Strengths	◇ A relatively accurate depiction of the atmosphere and workings of the emergency department of a hospital ◇ Real people and interactions between healthcare workers and patients were documented ◇ Real soundscape and environment were documented
Weaknesses	◇ Personal biases/prejudices could have influenced what was documented vs. what was not filmed ◇ This medium doesn't allow for any interaction with the viewer
Notes	◇ According to some ER nurses that we interviewed, this documentary series was pretty accurate
Link	https://www.knowledge.ca/program/emergency-room-life-and-death-vgh

4. Missed Messages by Angela He	
Type of Medium	Narrative 2D video game
Purpose	A romance / horror story about life, death and the importance of communicating.
Target Audience	Young adults, teenagers
Strengths	◇ Storytelling tries to builds upon characters within short period ◇ Beautiful visuals (original artwork that reflects story) ◇ More in-depth interaction with environment (e.g. can move windows around on desktop and click on notifications) ◇ Able to pan camera around in environment for more immersion ◇ Replayability as a game (w/ multiple endings) ◇ Important message that resonated w/ many players
Weaknesses	◇ According to reviews, some were concerned about implicated messages of the story (e.g., how it could be seen as your fault for not being able to prevent suicide) as well as how shallowly depression is portrayed in the game through the characters ◇ Some considerations to take away from this include being mindful of subtle messages and the portrayal of vulnerable individuals within a relatively short story where there isn't the luxury of having more time to develop characters + go in-depth into more sensitive topics
Notes	◇ No explicit instructional elements (more of a narrative piece as

	opposed to educational)
Link	https://store.steampowered.com/app/812810/missed_messages/

5. We Are Alfred by Embodied Labs	
Type of Medium	Virtual reality game
Purpose	A virtual, immersive case study designed to teach medical students about the aging experience from the first-person patient perspective.
Target Audience	Medical students
Strengths	◇ Full immersion achieved through the VR medium and a highly realistic experience was created using 360° video cameras filming real environments with paid actors/actresses ◇ Able to see facial expressions and body language of real people ◇ The medium allows the user to experience first-hand the effects of vision and hearing loss
Weaknesses	◇ Requires VR equipment which can be quite costly and is not easily accessible for everyone ◇ More of a video walkthrough where you experience the story rather than a game where your actions greatly impact the direction of the story
Notes	◇ The whole experience is quite short, lasting only about 15 minutes ◇ Made by a BVIS grad!
Link	▶ We Are Alfred - Embodied Labs

6. AS IF: A VR Game for Empathy	
Type of Medium	Virtual reality game
Purpose	An immersive game that places the user in the shoes of a grandma avatar who is tasked with baking a cake. The game is designed to facilitate the player's empathy towards the embodied grandma character, who is a chronic pain patient.
Target Audience	Non-patients (general public)
Strengths	◇ The player can directly manipulate the cake ingredients and tools in their environment which creates an immersive experience ◇ Monologue sheds light on the emotions of someone living with chronic pain while serving the guide the player towards next steps in the playthrough

	◇ Used 2 indicators to make it very clear what next steps for the player are (guiding voice and text)
Weaknesses	◇ Limited manipulation of the environment and static linear storyline ◇ Some players did not understand and became frustrated with the virtual pain cues of red flashes on the screen and limited physical movement of the avatar
Link	https://xintong.ca/portfolio/as-if-vr-for-empathy/

7. Into Aging: A Simulation Game by Therese Hoffman and Susan Dempsey-Lyle	
Type of Medium	Simulation game
Purpose	A simulation to give students a glimpse into the reality of aging helps to prepare them to be better physicians.
Target Audience	Medical students, residents
Strengths	◇ Students experience firsthand the frustrations of being a geriatric patient ◇ Players talk to role-playing physicians as they complete health-related tasks such as medical check-ups and prescription pick-ups and experience common forms of discrimination against the elderly in these interactions ◇ Players learn about common age-related health conditions and experience how these conditions may make an otherwise simple task very difficult ◇ Game explores the idea that ones health can drastically change in life-altering ways at any moment by changing the players health status for better or for worse at random
Weaknesses	◇ Requires supervision and many supporting roles ◇ Must be done in-person and in a group setting ◇ How safe students feel in the environment can directly impact their learning and is highly dependent on their comfort with the group ◇ Relies on a script which can make the experience feel inauthentic and therefore less conducive to an emotional response
Link	▶ The Into Aging Game: what's it's like to be elderly and hositalized

8. "Nursing Education: Infusing Inclusion, Embracing Equity" by Unbound Medicine	
Type of Medium	Recording of webinar

Purpose	Focusing on Diversity, Equity, and Inclusion in nursing and nursing education, this webinar includes a 30-minute presentation followed by a live Q&A conducted by Tiffany Gibson a nurse educator.
Target Audience	Nurses and healthcare workers
Strengths	◇ Webinar speaker begins with establishing credibility ◇ Starts off webinar with going over definitions to provide basis for learning (provides all listeners with a foundation/background knowledge) ➜ provides listeners right away with the proper language to use and internalize during learning experience ◇ Questions from viewers had about topics covered in webinar could be answered right away by speakers in Q&A session ◇ Webinar being recorded allows for people who couldn't attend live to review content at a later time and at their own pace
Weaknesses	◇ Very information-dense, some slides text-heavy ◇ Only some visuals included to supplement slides ◇ Webinar is ~40min long - hard to maintain concentration long time ◇ Gives quite in-depth/solid foundation on EDI topics but not as much time spent on how to apply this knowledge in real scenarios
Notes	◇ Can possibly reach out to Tiffany Gibson
Link	▶ Nursing Education: Infusing Inclusion, Embracing Equity

9. We Are Here: A Transgender Training Video for Healthcare Professionals	
Type of Medium	Educational video
Purpose	"We Are Here" is an educational video focusing on transgender healthcare produced by Mandala Center for Change and Whaleheart Productions. This video is being integrated as required training for local medical providers and support staff.
Target Audience	Healthcare professionals
Strengths	◇ Build empathy through viewing role-play of transgender patients receiving care in many different scenarios ◇ A diverse cast of actors was chosen (good representation) ◇ Provided glossary of proper terminology regarding gender ◇ Instructional elements/teaching moments were integrated throughout video (the actors occasionally broke role and helped to break down / analyze the situation)
Weaknesses	◇ Glossary that was provided at end of video had many terms and not enough time to read through/internalize them all

	◇ Sometimes the actors breaking their role was quite jarring / lost the sense of immersion in the scene, also sometimes hard to differentiate when they are acting vs. out of character (change in camera angle or body language did help) ➜ So maybe there should be clear distinction between instructional elements vs. immersion in the scene of a video game
Notes	◇ Producers chose to have teaching moments integrated throughout video - was able to reflect upon situation immediately / very soon after it was shown - did this lead to more impactful learning? Does this help the viewer make more direct connections between the video content and its applications in real life?
Link	▶ We Are Here: A Transgender Training Video for Healthcare Professi…

10. Module #97000: Implicit Bias in Health Care	
Type of Medium	Online module
Purpose	This online course explores definitions of implicit and explicit bias, the nature and dynamics of implicit biases, and how they can affect health outcomes. Strategies are discussed to assist in raising professionals' awareness of and interventions to reduce them.
Target Audience	Practicing healthcare professionals
Strengths	◇ Comprehensive overview of EDI topics (explains definitions, theories, models, measurements as well as strategies and interventions which are more applicable in practice) ◇ Clear use of text hierarchy to break up sections, clear and easy to read font choice ◇ Interactive questions/polls and further resources to explore are provided throughout the module
Weaknesses	◇ Extremely text-heavy, text is broken up into sections but it is easy to get overwhelmed by long webpage of material ◇ No use of visuals aids to reinforce or supplement information being taught in module ◇ No way to conveniently navigate between different sections of the module (have to scroll until section heading is found)
Link	https://www.netce.com/coursecontent.php?courseid=2234