Approaching Difficult Terrain with Sensitivity: A Virtual Reality Game on the Five Stages of Grief

Daniel Roth, Sebastian von Mammen, Julian Keil, Manuel Schildknecht, Marc Erich Latoschik Julius-Maximilians-University, Würzburg, Germany {daniel.roth,sebastian.von.mammen,marc.latoschik}@uni-wuerzburg.de {julian.keil1,manuel.schildknecht@stud-mail.uni-wuerzburg.de}@stud-mail.uni-wuerzburg.de

Abstract—Educating about death is a challenging task as facing death generally poses a severe and stressful situation. We present 5Days, an immersive virtual reality game in which the player has to proceed through five different levels, which are designed on the basis of the five stages of grief described by Kübler-Ross: Denial, anger, bargaining, depression, and acceptance. Immersed in an atmospheric virtual world, the five levels instigate reflection and education about these stages. Based on early feedback from palliative care specialists, we argue that the realised concept could be a new entry point into the education and reflection of death, especially for medical students and personnel.

I. INTRODUCTION

According to [1], there are five stages of grief that describe the emotional condition of people confronted with death. These are Denial, Anger, Bargaining, Depression and Acceptance. These stages are not just experienced by dying people, but also by their relatives and friends. The stages are not experienced in a linear progression, rather each individual undergoes them in a different order and may go through some of them more than once. Therapists, doctors and other medical personnel from palliative and hospice care discuss these stages with dying patients and their relatives, complementing their efforts to address the patients' physical, psychosocial, spiritual, and practical concerns [2]. Interactive media and games could support students and palliative personnel to learn and refine the empathy needed to accompany dying patients [3]. In the long run, they might also be used to support palliative therapy by providing an alternative access to process death and help affected relatives or even patients themselves. Different alternatives to approach this topic are especially desirable as young patients with life-threatening or life-shortening conditions may have troubles to understand the information provided by the therapists and doctors [4, see p. 158f]. Based on this rationale, we have designed 5Days, a virtual reality game with an educational, atmospheric narrative based on the five stages of grief. Due to its purpose beyond mere entertainment, 5Days can be called a serious game [5]. The mechanics of the game were designed to make the player reflect on what is experienced during playing the game. This focus on self-reflection required the design of an accessible experience overall, not only in terms of navigation and interaction controls but also in terms of the complexity of the virtual environment and a seamless traversal of the narrative. In Section II, related work is presented. Subsequently, in Section III, the methodology is explained in detail including the game's concept, mechanics, user interactions and the design of the virtual environment. Afterwards, in Section IV, we present a brief summary of our

preliminary results and next steps: So far, we do not have conducted scientific professional tests, yet. However, numerous playtesting sessions as well as first professional feedback on the game's footage cautiously confirm the adequacy and functionality our game design prototype.

II. RELATED WORK

While many games implicitly subject the topic of death, such as Severed¹, Guacamelee², The Journey³, or The last of Us⁴, there are only few games that broach the issue of death and grief more explicitly. One game stronger related to death and grief, but without a specific educational or supporting background is Brothers: a tale of two sons⁵. It tells the story of two brothers, of which one of them saw his mother drown during a boat trip. Later, their father gets severely sick and to find the healing potion is the quest of the game. The topic of death is a present throughout the narrative, ending in the father and sons commemorating their wife and mother. Another example in the context of war is: This War of Mine⁶. The game asks the player to make decisions to guide a group of civilians through war, to commit morally good or bad deeds, and to maintain their physical and psychological well-being. Apart of me^7 is the game with the strongest connection to the topic that we found. It is a mobile 3D video game designed by experts in child bereavement. It aims to provide emotional support by developing emotional literacy, sharing stories with other people in similar situations, providing mindfulness and encouraging important and difficult situations [6]. It is an adventure game that plays on an island. Next to small item-based quests [7], it includes mechanics such as a digital memory storage and relaxation zones for calm.

When Elisabeth Kübler-Ross researched the emotional phases dying people go through [8], she identified the five stages of grief, necessary to process the patient's challenging situation: (1) Denial, where the patient denies the cause of death and its consequences. (2) Anger, where the patient becomes frustrated and expresses anger. (3) Bargaining, where the patient bargains for an escape from the cause of death. (4) Depression, where the patient gets depressed and isolates himself. (5) Acceptance, where the patient accept that he has

¹Severed by DrinkBox Studios, 2016.

²Guacamelee by DrinkBox Studios, 2013.

³The Journey by Thatgamecompany, 2012.

⁴The Last of Us by Naughty Dog, 2013.

⁵Brothers: A Tale of Two Sons by Starbreeze Studios, 2013.

⁶This War of Mine by 11 bit studios, 2015.

⁷Apart of Me by Bounce Works, 2019.



Fig. 1: The player remains in the same area throughout the game, but different details change the atmosphere to match the five stages of grief (a-e). In the navigation tutorial (f), the player is required to actively start the journey by moving into the lit house.

to die. The difficulties of death education (for both teachers and pupils) can be overcome simulating real-world scenarios, where the participants adopt a role and attempt to act appropriately to persuade an audience [9].

III. METHODOLOGY

5Days was mainly developed on the basis of Kübler-Ross' works [1], [8] in iterative manner, trying to use athmosphere and mechanics to evoke an ambiance similar to her descriptions. In 5Days, the player is immersed into an atmospherically rich virtual environment created from the comprehensive asset pack of the game Infinity Blade. He is equipped with the Oculus Rift virtual reality head-mounted display and 3D touch controllers. In the virtual world, the player can navigate using teleportation and, for instance, pick up items (e.g., tools or torches) and interact with objects (e.g., levers) by means of a button-detected grabbing gesture. We translated the five stages of grief into five levels with atmospherically fitting assets (graphically and auditive) and riddles, such as balancing a scale in the bargaining phase. The five stages of grief aren't experienced by every people in the same order [1]. In our approach, the first and fifth stage are always the start and end stages of the game but different players may go through the levels in a different order. After the first stage, we the next stage is therefore selected by an automatism on the basis of probabilities (50 % stage 2, 25% for stage 3, 25 % stage 4) and fourth stage (25%). If the second stage is chosen the next stage may be stage 3 (50%) or stage 4 (50%). If the third or fourth stage are chosen as the second level, the next level might be stage 2 (75%) or stage 3/4 (25%), respectively. The narrative is primarily paced by the player's ability to solve riddles. However, in case the player cannot solve a given riddle, the game will progress anyways after some time has passed—Just like death cannot be stopped forever [8]. More concretely, a timer starts when the player enters a specific area in the virtual world. Each timer allows for extensive exploration and is fine-tuned to fire only, if it becomes apparent that the player has had ample opportunity to solve the riddles but did not do so. To further alleviate the challenges that might be encountered by the players, we ensured that there are several possibilities to solve each riddle. Just as death is the overarching topic of all the stages of grief, the player navigates through only one environment throughout all of the five levels: We adjusted the atmosphere for each of the levels by means of dedicated background music, visualised weather conditions, and colourising post-processing filters to fit the respective emotional phases. Figure 1 depicts one and the same view of the player across all five levels. Figure 2 highlights the different weather conditions complementing the level designs.

Whereas the game Apart of me [6] focuses on specific game mechanics and atmosphere combined with communicative aspects, we tried to exploit immersion as a factor to support the transportation into the situation, implicitly experiencing the atmosphere of the stages of grief. Immersion can be described as the effect when a virtual environment is capable of shutting out sensations from the real world and let the virtual world seem real [10]. Is this effect vigorous and one really believes "being there" in the virtual environment, it is referred to as presence [11], [12]. It is important that the player is not exposed to so-called breaks-in-presence (BIP), that there are no technical issues that disrupt the experience, e.g. long loading times for the next level data might disorient the player. For this reason we relinquish loading times completely. Just seconds before one level is changed to another, the brightness rises until the player is not able to see anything. At this point, levelspecific data is instantaneously switched, including various game elements and their states as well as the necessary visual and auditive effects. When the brightness is levelled briefly thereafter, the player, as he remains his position, will maintain his orientation and notice the changes in the world immediately (as seen in Figure 1). The simple control scheme (one-button navigation and one-button grabbing gesture) is supported by an animated hand model, i.e. the used 3D touch controllers by Oculus can infer to which extent the players' hands are opened.



Fig. 2: Differences in weather conditions (snow/thunder) to foster affective responses by the players.

The simplicity of the controls alongside the continuous visual feedback from one's hands increase the game's accessibility. It is furthered by the following mode of navigation based on teleportation [13] that we introduced: We placed checkpoints at all important places in the world. The player only has to point with one controller in the direction of a checkpoint and it will start glowing. After pressing the teleportation button, the player will be moved to the selected checkpoint as shown to the player at the beginning of the game, see Figure 1.

A. Story and Stages

In analogy to the evolution of the five stages of grief, the story unfolds slowly across the levels of the game. The player assumes the role of a dying man unaware of his fate. Step by step, he finds out about his situation and also about the circumstances which took him there. The rationale for the five levels corresponding to the the five stages of grief is as follows.

a) Phase 1: Denial: Denial is most likely the phase first entered when confronted with the topic. Persons are shocked and deny the facts of reality, which is a natural protection mechanism of the body to prevent people from processing more than they can take [1]. Yet, a high level of confusion and fear is present. The healing process can only start, if the person accepts reality and starts asking questions. We translated this emotional transition by first instructing the player (through a narrator's voice) to search for a key that unlocks the door of a house nearby. When entering the house, the door closes by itself and the player is locked up. Multiple spheres move around the player, whereas one is different from all the other ones, see Figure 3(a). If the player touches this sphere, he is able to leave the house and continue the adventure. This mechanic is simple: The feeling of being stuck is conveyed and the player can only move on, if he accepts this feeling and regains a rational view, in this case required to solve a simple comparison.

b) Phase 2: Anger: Anger is often the second phase following acceptance. It is not only directed towards the cause of dying, but may also extend to other persons such as doctors or friends and family, or even to god. Although it is not pleasing, this phase is important for the healing process and should not be suppressed [8]. In the game, the player is spawned on an over-dimensional chess game, as can sometimes be found in public city parks. The atmosphere is dominated by powerful natural phenomena such as flowing lava and the rough sounds of thunder creating a highly arousing, threatening atmosphere. Allowing for irrational behaviour disregarding rationality, the player is supposed to destroy all chess figurines with a hammer to end the phase. There is no rationality or intelligence required for this phase, it is designed to reflect pure anger, see Figure 3(b).

c) Phase 3: Bargaining: In the bargaining phase, people confronted with death or the death of a close person desperately try to search for a way out of the situation. It is important in this situation not to make false promises, in order not to stop the healing process. Often patients do not solely rely on professional advice but turn to relatives and friends, or spiritual rituals, to pray for healing [1]. In the game, we realised this process of bargaining by tricking the player into believing he should balance a scale, see Figure 3(c). The only apparent objects to balance the scale are feathers falling from the sky. Yet, as the most desirable bargaining outcome is not an option, the solution to the situation is to focus on something else entirely. Instead of changing the scale, the player only needs to shift a nearby rock-the obvious and initially intended negotiations failed. This in turn makes the scale vanish and completes the task.

d) Phase 4: Depression: The depression phase often starts when it is clear that negotiation failed. Depressions after the loss of a beloved person or the realisation of pending death are no sign of psychological illness, but an expected, normal reaction. Affected persons feel helpless and trapped [1]. In the game, the player has to find a way out of a maze. The atmosphere is dark and only little visual guidance is presented, see Figure 3(d). The player has to move around obstacles and find his way out of the maze, and there is only one way out in order to reach the acceptance level. The maze exhibits a repetitive nature and finding one's path is inherently frustrating, yet there is a way out, if only one follows the hints that do not dominate one's perception.

e) Phase 5: Acceptance: Acceptance does not imply that everything is alright. It is quite the opposite as for large number of dying people, it will never be alright again. Acceptance means to accept reality and its consequences and for relatives and friends to continue in the situation and make new plans, or for people facing death to use their time actively [1]. In the game, the player finds himself on a decorated graveyard. Some candles are burning as sign of grief and condolence while others are not lit. The atmosphere is dark, yet spiritual and dawn is rising. To light the remaining candles in a specific order ends the game. By performing this gesture, the player gives in the ceremonial of mourning death.

IV. RESULTS, DISCUSSION AND CONCLUSION

5Days was iteratively developed with external playtesting (colleagues or students from the computer science department,



(a) Level 1 / Denial



(b) Level 2 / Anger



(c) Level 3 / Bargaining



(d) Level 4 / Depression



(e) Level 5 / Acceptance

Fig. 3: Main game elements of the five levels/stages of grief.

friends, family) sessions roughly every other week (the whole development took 6 months so far) which resulted in continued simplifications of the navigation and interaction. It also ensured that the play and level mechanics were in line with our targeted semantics. Although we have not scientifically verified that the targeted emotions and, as a second step, the intended semantics are experienced and understood by an arbitrary test crowd, our preliminary tests confirmed our intuitions and that the rationale for the game design and the outlined mechanics reportedly support the progression through the named phases of grief (revealed in in-situ dialogues with the testers). Further improvements could for example include stage/level changes based on adaptive storytelling rather than a probability-based decision. In addition, we had the chance to show video footage and describe the game to an experienced (more than 30yrs) palliative medical specialist. He stated that "I can confirm that there is great potential for the application of this game primarily in (a) the education of students of medicine and psychology, (b) continued education of doctors, especially those specialised in palliative treatment, (c) potentially patients and their relatives, although palliative patients are usually seriously ill, which is why this would have to be considered on a case-by-case basis." We did not conduct a larger scale expert evaluation yet, and thus are not able to present data on the quality of the desired emotions and reflections at this point, which would be the next important step to judge the applicability and utility of 5Days and its underlying concept. Following this evaluation, we would need to join a collaboration with psychologists to actually capture the and quantify the effects of playing 5Days on various target groups-from students over medical personnel to affected patients.

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REFERENCES

- E. Kübler-Ross and D. Kessler, On Grief and Grieving: Finding the Meaning of Grief through the Five Stages of Loss. Simon and Schuster, 2005.
- [2] B. P. Himelstein, J. M. Hilden, A. M. Boldt, and D. Weissman, "Pediatric palliative care," *New England Journal of Medicine*, vol. 350, no. 17, pp. 1752–1762, 2004.
- [3] P. Boston, A. Towers, and D. Barnard, "Embracing vulnerability: risk and empathy in palliative care.," *Journal of palliative care*, vol. 17, no. 4, p. 248, 2001.
- [4] A. Goldman, R. Hain, and S. Liben, Oxford Textbook of Palliative Care for Children. Oxford university press, 2012.
- [5] S. De Freitas and F. Liarokapis, "Serious games: A new paradigm for education?," in *Serious Games and Edutainment Applications*, pp. 9–23, Springer, 2011.
- [6] B. Works, L. Weinstock, and B. Page, "Apart of Me Helping families talk about death," 2019.
- [7] B. Cavallari, J. Heldberg, and B. Harper, "Adventure games in education: A review," *Australasian journal of educational technology*, vol. 8, no. 2, 1992.
- [8] E. Kübler-Ross, On Death and Dying. Routledge, 1973.
- [9] A. Klingman, "Simulation and simulation games as a strategy for death education," *Death Education*, vol. 7, no. 4, pp. 339–352, 1983.
- [10] M. Slater and S. Wilbur, "A framework for immersive virtual environments (FIVE): Speculations on the role of presence in virtual environments," *Presence: Teleoperators and virtual environments*, vol. 6, no. 6, pp. 603–616, 1997.
- [11] C. Heeter, "Being there: The subjective experience of presence," *Presence: Teleoperators & Virtual Environments*, vol. 1, no. 2, pp. 262–271, 1992.
- [12] B. G. Witmer and M. J. Singer, "Measuring presence in virtual environments: A presence questionnaire," *Presence: Teleoperators and virtual environments*, vol. 7, no. 3, pp. 225–240, 1998. 02842.
- [13] L. J. Hettinger and G. E. Riccio, "Visually induced motion sickness in virtual environments," *Presence: Teleoperators & Virtual Environments*, vol. 1, no. 3, pp. 306–310, 1992.