

Pro(f)Social: a serious game to improve teachers' bystander behaviour in cyberbullying situations

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ABSTRACT

Cyberbullying is an issue that is present in society now more than ever before. With the development of technology, and an increase in our dependency on it, students have to deal with cyberbullying situations more frequently. Serious games have shown promising results in their efficacy as a means to promote pro-social behaviour. Pro(f)Social is a serious game for teachers, that aims to improve their bystander behavior on cyberbullying situations. It is a visual novel style game, where the player plays in the role of a teacher in a school where there is a cyberbullying situation happening between students. Their goal is to unravel the details of the situation, while still doing their school related work at the same time. In the game, they have to explore the school, dialogue with students, and complete their school tasks during the course of 3 breaks and classes. All of these actions cost time, and the player has a limited amount of time in each of the breaks. The scoring system reflects the goal of the game, as the player is rewarded for being pro-social, by paying attention to the dialogues, and then identifying the details of the situation correctly during inner reflection moments in the game. The player can get feedback throughout the game, which shows them if they were pro-social or not with their actions and opinions. The prototype for the first of four sessions of this game has been validated with teachers, and it showed promising results in how it portrayed the situations and its utility as a formation tool.

KEYWORDS

cyberbullying, serious games, pro-social, teachers, improve bystander behavior, visual novel

1 INTRODUCTION

Cyberbullying or bullying via data and communications technology instruments, such as the internet and mobile phones, is a problem of growing interest with school-aged students.

About 37% of young people between the ages of 12 and 17 have been bullied online, with 30% being recurring cases[1]. This is observed through social media in a variety of formats, including personal messages, emails, commentaries, pictures, and catfishing¹. Cyberbullying can happen often and repeatedly thanks to a freedom of access to a person's life and can be perpetuated through anonymous, gossip-fuelled apps such as Instagram, Facebook, and Twitter. Since arising with the growth of technology in the 1990s, cyberbullying methods have been increasing in both quantity and accessibility. Despite legislative attempts to fight cyberbullying, online harassment remains a serious issue in today's society[2].

¹The practice of pretending on social media to be someone different, in order to trick or attract another person

Although generally speaking cyberbullying activities do not happen on educational premises, the victims feel their harmful consequences in school. This can contribute to a decline in learning, and brings instability to their school life, and their relationships with other people in general[3]. Many times, the victims refrain from asking for help, either be it from their parents, their teachers or their fellow classmates, because of reasons ranging from feeling intimidated by the reaction of the bullies in question, being scared to appear weak to others, or even by thinking it would not change anything in the situation. This is propagated by the fact that the cyberbullies in question are usually from the same school or even the same class, and although many times there are other students witnessing these bullying events, they do not offer help or ask an adult for guidance, even though they know the wrongfulness of the situation. This is a common studied phenomenon known as the "Bystander Effect"[4]. As such, adults, specifically parents/tutors and teachers, being the more common type of adults the teenagers are in contact with, need to take initiative, and be present for these students that are dealing with cyberbullying.

Teachers, in particular, play a big role since they are at school and more often than not end up interacting with both the victims and the bullies. They are in a position where they can observe the interactions between the students, and can infer if someone is being bullied or is suffering from the consequences of cyberbullying. However, this is all dependent on the teachers themselves, their knowledge on how to identify these (cyber)bullying scenarios, and their type of response when faced with them. This need for information on how to detect and identify cyber/normal bullying scenarios is an essential part of combating this problem, and multiple learning programs have been developed and presented with positive results in the last decade.

Some of these programs include Serious Games, which are designed with the intent to educate the user in a more playful way, without losing the important teaching part. These types of games have been gaining traction over the last few years, with many of them showing positive results in bridging the gap between information and entertainment. The market for cyberbullying oriented games is not huge, but some games have showed promising results.

2 RELATED WORK

2.1 Com@Viver

Com@Viver is a serious game created for students to improve bystander behaviour in cyberbullying situations[5][6]. It is meant to be played by 3 users at the same time in the same machine, for 5 different sessions (the first being an introduction to the game mechanics). The players play in the role of students in a class where

a field trip is being organized, and their objective is to be on the winning team to go on said trip.

The game mimics a Social Network Site, where the players can interact with the posts of other students, and the aim of the game is for the users to identify the cyberbullying scenarios that occur during the game. At the end of each session a voting takes place, in which the team to go on the trip is elected. The players will get more or less votes from the remaining students depending on the actions they take (positive behaviour is rewarded; negative behaviour is penalized). If they get the most votes, they are the chosen team for the field trip.

The game is populated by 12 Autonomous Agents that form the other 4 groups, and they can comment and post on the network. Each agent has an avatar picture, and a backstory to immerse the player and to provide a degree of realism and attachment. Some agents play as the victim, some as bystanders, and others as the bullies, while the player is purely a bystander. This makes it so the game offers a realistic simulation of how a social media network between students operates, and how as a bystander the player can influence the actions of other students. In terms of the scenarios of the game, they revolve around the bullying of a specific student, and depending on the actions of the player, it can grow in size, or switch focus and cause disarray between multiple students. As an observer, the player does not have direct impact on the agents' actions, but they can influence them through the choices they make in the dialogue with the characters.

Com@Viver was first released back in 2018, and updated in 2020 with a new Artificial Intelligence for the agents using the FAtiMA Toolkit emotional engine. This engine provided the agents with more social and emotional intelligence, to further provide immersion and realism to the game. Both sets of tests to the game were done in public portuguese schools. In the most recent iteration, the tests were focused more on the interaction the players had with the artificial intelligence agents.

2.2 Conectado

Conectado is a serious game created for students, with the aim of raising awareness to the consequences of bullying and cyberbullying on children [7]. The player controls a student that has just enrolled in a school, and must go to classes every day. The perspective is that of a classic 2D "point and click" game, where the player interacts with the environment by only using the mouse.

In the game, the player starts off each day at their home, and must go to school and attend their classes. They can interact with characters, like their parents or their classmates through dialogue, and depending on the interactions, the player can increase or decrease their relationship level, albeit with some limitations due to how the story is presented (you cannot get a positive relationship with the bully for example). These interactions however are somewhat limited, with a small amount of dialogue choices, and sometimes locked until a specific event has been completed, which can reduce the feeling of agency² in the player. In school, there is a pair of bullies that make life hard for the main character by bullying them on school and in a social network online. The objective of the

²The degree to which a player is able to cause significant change in a game world

game is to find a solution to stop the bullies from abusing you and anyone else.

One of the features of this game that distinguishes it from many others is the fact that the user plays the role of the victim, as opposed to the usual bystander role. This provides a way for the user to experience the sensation of being a victim of cyberbullying, which can help create empathy towards victims and by consequence diminish the issue of the already mentioned bystander effect.

3 PRO(F)SOCIAL

Pro(f)Social is a visual novel style game designed for teachers to play, with the goal of sensitizing players to intervene in cyberbullying situations. It runs on the Ren'Py engine, and therefore, has support for Windows, Mac and Linux. The game is divided in 4 sessions, with one being currently complete, alongside an introductory session that serves as the tutorial.

3.1 Setting

The player plays the role of a teacher in a small middle school, with a session representing a school day. The game starts in the middle of a school year, with the player arriving at school during the morning, and acknowledging the fact that he heard rumors of some issues among some of the students. There are 12 students that appear at the school, and the player only has information on 6 of them, which correspond to the ones that belong to his class (the player is the class director of the 9th grade class A). During the day, the player goes through 2 classes and 1 meeting, with a 15 minutes break before each one (and a lunch break in between). During the breaks, the actual gameplay happens, and the player can interact with students, do tasks, and explore, as will be explained further ahead. During the classes, the player learns some information about the rumors circulating the school. The objective is to complete special tasks related to the rumors, and reach the end of the day with full knowledge of the situation, while still doing the tasks related to the teacher job.

3.2 Characters

The characters present in the game are the 12 students present in Com@Viver. Their relationships and overall identity were kept the same, to ground the game in the reality setup by Com@Viver. This meant the characters were still split into the same 2 groups: the in-group students from class A, which belong to the player's class, and the out-group students from class B, which the player does not have much information about.

Visually, the avatars Com@Viver used were static photos of the characters, and we now needed a way to express different emotions with them. As such, we decided to remake the characters visually using software³ that allowed us to use different emotions for the characters. This way we could maintain the visual novel style of characters displaying different emotions depending on their mood in the conversation (see 1).

Using this tool, we created a set of emotions for each of the 12 students, composed of Normal, Annoyed, Angry, Disgust, Happy, Laughing and Sad, with some specific characters having an extra emotion or two due to the dialogue requiring it. However, this tool

³<https://charactercreator.org/>



Figure 1: From left to right: Angry, Normal and Laughing emotions of the character Nando.

had its limitations. Although it provided with a full body option for the characters, the poses were not what we were looking for. Instead, we decided on using silhouettes for the characters. The main reason for this was due to not finding a feasible way to create all 12 character bodies, maintaining a similar art style to the one used in the emotions. But, after testing the first few iterations of the game with the silhouettes, we found that the effect was not as off putting as we thought in the beginning, and it ended up making a good contrast with the background, as well as giving a bit more of mystery to the player about the students, as in, they had to listen and interact with the students to actually be able to see their facial expressions.

Each character is associated with a different color as well, which is represented by a name color when in dialogue, as well as in the clothes (for example Nando's color is dark blue). We also put the names on the silhouettes, so that the player would not be obligated to memorize who corresponded to each silhouette, but only the in-group characters had colors, with the out-group characters being greyed out.

3.3 World and Interface

The story takes place in a middle school, where the player can access 15 different locations, from multiple corridors and floors, to a library, a teachers room and some classrooms. The idea was to create a diverse enough school so that the player feels the ambience of an actual school, while at the same time making it a relatively small size to not overwhelm the player. Taking a look at figure 2, we can observe what a typical game state looks like:

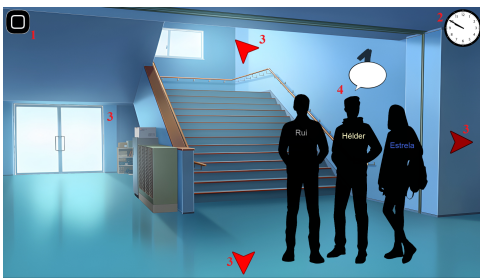


Figure 2: A school corridor with some students chatting amongst themselves.

- (1) The menu. This allows the player to access their task list, the map, their student list and the feedback, and is the tool that the player will use the most during the gameplay. We will explain each of these 4 items further ahead.

- (2) The clock. This represents the game time, and consequently, the amount of time the player has until their next class or meeting. Every break is 15 minutes long, and in this case, the break started at 9h45, which means the player has 10 minutes left before it ends.
- (3) The red arrows and the door. These represent the possible move actions the player can make. Entering a room or a new space is done by hovering the mouse over the corresponding door (the door is then highlighted just like in Figure 3), while movement between corridors is done through the red arrows. The rightmost arrow is shaded darker because it represents the direction we just came from.
- (4) A group of students. Throughout the school, multiple groups of students (sometimes a singular student) are spread out, and the player can click on them (see Figure 3) to hear dialogue between them, with each line read taking up time. The player can exit this dialogue anytime they want, or they can listen to the full conversation. The speech bubble represents the tone of the conversation, as well as the first person to talk in the dialogue. It can be a normal bubble to represent normal conversations, a spiky bubble to represent loud conversations, or a thought bubble that represents a student who isn't talking, but we can still interact with them to observe what they are doing.

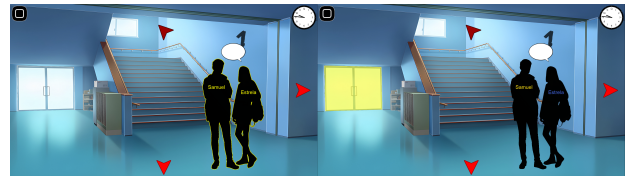


Figure 3: The highlight effect when an object is interactable. Both the students and the door get highlighted in yellow when the mouse is hovered over each of them. The same applies to any menus or interface items, such as the movement arrows. Task related objects get a zoom effect instead of a yellow highlight.

Regarding the previously mentioned menu, when clicked, it shows 3 new menu buttons, each with a different function. This was done to reduce visual clutter, since having the 3 buttons showing all the time would take up some space on the screen at all times.

The first submenu is the task list, which shows the player the tasks they currently have to do before the end of the break. If the player does these tasks, they are marked as successful with a green check and text color, but if they don't complete the tasks, they are instead marked as failed with a red cross and text color. When a task status is updated (completed or failed), or a new task has been added to the list, the menu is highlighted in a red color. The tasks that relate to the cyberbullying situation have a button to manually conclude them (see Figure 4).

The second submenu is the map, which shows the player the blueprint of the current floor they are on. It is also interactable, and the player can switch between the floors to check where a specific room is located (see Figure 5).

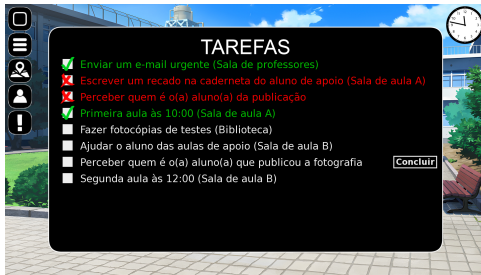


Figure 4: The task menu. White tasks are the current tasks, green are completed and red were failed. The 7th tasks is related to the situation so it has a complete button.

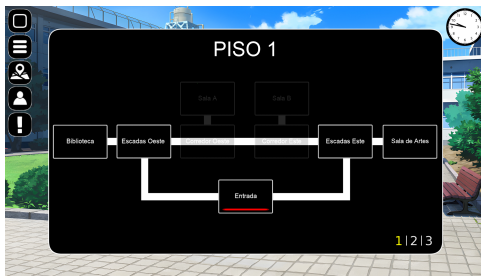


Figure 5: The map menu. It shows a blueprint of the current floor. By pressing the numbers on the bottom right, the player can alternate between the blueprints of each of the 3 floors.

The third submenu is the student list, which shows the player the 6 students that are on his class (the in-group). Due to how the story was made, the player is supposed to know these 6 students, and as such, we needed a way to easily check information about them. As such, the player can access this menu at any point to see who their students are and check some information about them (see Figure 6). The information that is presented updates during the game to reflect on some events that happen in the story.

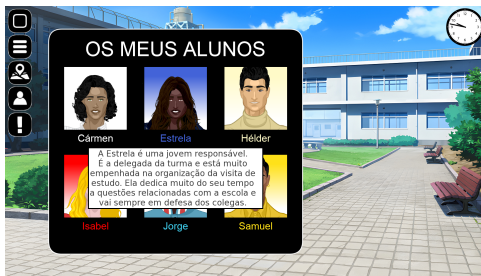


Figure 6: The student menu. It shows the 6 students that belong to the player's class. Hovering over the picture of a student shows a brief description of them.

3.4 Actions

A session in the game is composed of 3 breaks and 3 events, beginning with a break at the start of the day, and alternating between

the 2. During the events, the player has no impact on the game, and purely spectates it (these can be a class, or a meeting). However, during the breaks, the player can make many different actions, with each action costing different amounts of time.

The most basic action is movement. As referenced before the player can move around the school by interacting with doors or the red arrows. Each time they move between 2 areas, some seconds are added to the clock time. This makes it so the player cannot be indefinitely roaming in the school even if they're not completing any activities.

One of the major actions the player can do is complete tasks. During each of the breaks, the player has 4 tasks to complete. Two of them are normal tasks, which involve the player doing something related to their teaching job (sending an e-mail, helping a student with a question, etc.). One symbolizes what the player has to do after the break, like giving a class or attending a meeting; this type of task can be completed by the player at any time in the appropriate place, effectively ending the break, but it gets auto completed when the break time comes to an end. And the fourth one relates to the cyberbullying situation of the session. This last one requires the player to write down sentences related to the cyberbullying events, with information that they gathered throughout the breaks while interacting with the students. Tasks are completed by clicking on the objects corresponding to the task description, with the exception of the last type of task, which only requires the player to click on a button next to the task description.

The other action the player can do is to observe (and in some cases talk to) students. The player can click on a group of students and then listen to them converse. Each line of dialogue costs some time, and the player can leave the dialogue at any time (see Figure 7). We can classify the content of the dialogues in 3 categories: generic, distractor, and sign of alert.



Figure 7: An example dialogue. The silhouettes of the characters participating in the conversation appear in the background. The face of the person speaking appears in full view, displaying their current emotion.

Generic dialogue, like the name implies, is when the students talk about mundane subjects (a TV show, a sport, what they did on the weekend, etc.). These represent the idle chat students have between themselves.

Distractor dialogue is meant as a dialogue that at first glance might imply there exists a problem or situation, but when the player gets all the information pertaining to that supposed situation, they realise it was just a misunderstanding. These were added so as to

show the player that not everything is black and white, as in, if it's not mundane talk, then it's not automatically a cyberbullying situation. An example of this happens with one of the students, Jorge, who in some dialogues is mentioned to have been missing some classes. By the last break of the day, the player finds that the student was simply gone on doctor's appointments, and there weren't any cyberbullying related motives.

Lastly, sign of alert dialogues are conversations that relate to the cyberbullying case of that session. They involve at least one of the characters related to the cyberbullying situation, and their intent is to give the player information about the current situation.

The number of dialogues for each category is roughly the same across the session. There are a few extra dialogues that are special in their nature, because the player is forced to observe them, independently of their choices. They represent the actual cyberbullying situations, and unlike all other dialogues, these are static in their position, meaning they always happen at a predetermined location. They have some other features, which we will go into detail in Subsection 3.6.

3.5 Populating Algorithm

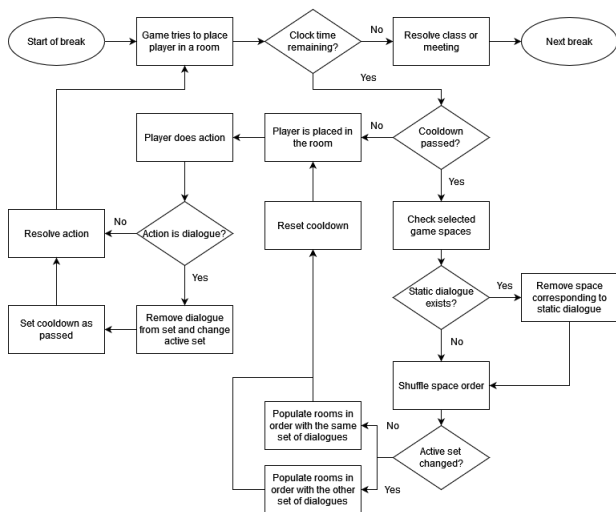


Figure 8: A diagram representing how the algorithm works.

During development, we stumbled upon a problem when designing the dialogues. We had to make sure every student only appeared in a single spot in the school at any time. Adding to that, we also had to create multiple dialogues for each student, and these dialogues should be made up of different groups so as to mimic how real life interactions happen (teenagers have multiple friends and tend to be in different groups), while removing the chance of the player repeating the same dialogue interaction. To solve this, we recurred to the use of an algorithm.

Firstly, 2 sets of dialogues were created for each break, with both sets having different groupings of the students with no repetitions (example: with 4 students [A, B, C, D], set 1 could have the groups [(A, B), (C,D)] and set 2 could have [(A, D), (B, C)]). During the game, at the start of each break, a set of dialogues is selected, and

the school is populated by the groups of students (some areas aren't included in the pool of possible spaces, like for example the teachers room). These groups remain in those spaces until either 1 minute has passed in the in-game clock or the player interacted with the group. If 1 min passed, the current groups change spaces, so as to mimic movement in the school. Else, if the player interacts with a group, then after completing the dialogue, the current set changes to the other one, and the school is populated by these new groups of students (the group that was interacted with is removed from the pool of the set it belonged to). This happens in a loop, until both sets have no more students, at which point the school is not populated anymore; or the break time ends and the player is sent to the next class or meeting (see Figures 8 and 9).

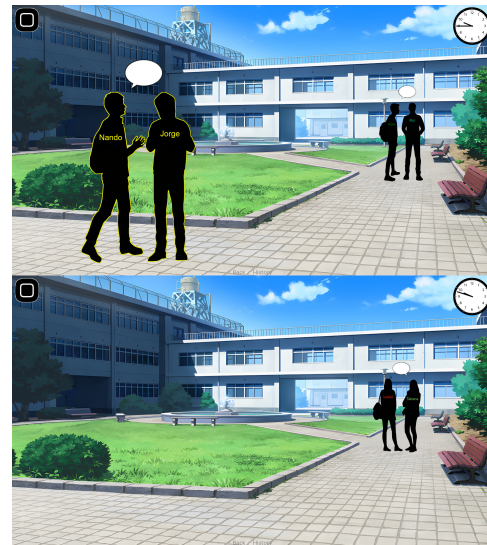


Figure 9: An example of the algorithm in action. After interacting with the students highlighted on the first image, the set of dialogue changes, and all the groups in the school are removed, being replaced by groups of the new set, as seen on the second image.

3.6 Reflection and Feedback

During the course of the game, the player witnesses certain cyberbullying events through specific dialogues, which we call "situations" (in this first session there are 4 of them). These situations are exposition dialogues where some characters talk about the cyberbullying situation in a more direct manner. After witnessing one of these, the player is prompt with one or more questions regarding their interpretation of that situation (see Figure 10), as well as filling a questionnaire (in the last situation two) where they indicate their degree of agreement according to a list of sentences (see Figures 11 and 12). The questions have psychological components, being moral disengagement, empathy, emotional regulation, and intervention, with each of the situations taking one component.

The player can then check the feedback on their answers on these questionnaires. By accessing the Work Office, they can speak to a teacher, Professor João, and get feedback on if their choices

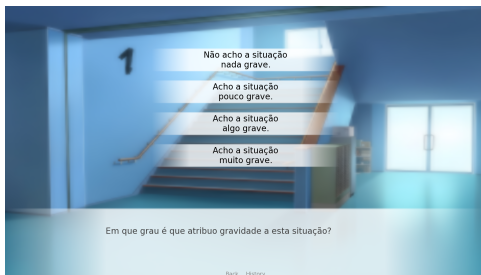


Figure 10: An example of the questions given to the player. They are always multiple choice answers.

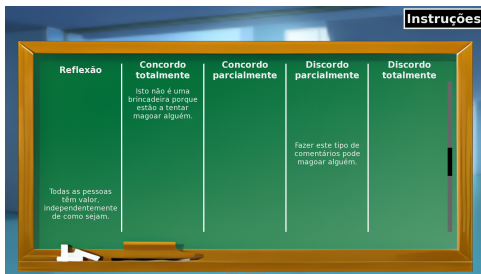


Figure 11: An example of the questionnaire. The player must drag the sentences on the first column (Reflection) to one of the 4 other columns (Total Agree, Partial Agree, Partial Disagree, Total Disagree)

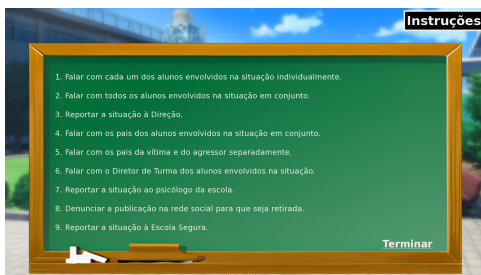


Figure 12: An example of the extra questionnaire present in the last situation (if the player chooses a specific option in the question beforehand). The player must order the sentences in regards to their importance.

were adequate or not. This evaluation is based on if the player answered with any value of Agreeableness, and shows a green positive feedback when the player made an adequate choice, and a red negative feedback for the opposite. In addition to the feedback for the questionnaires, the player can receive feedback on the completion of the special tasks relates to the cyberbullying situation. If they complete the task, they get a green positive remark, and the opposite earns them a red negative remark. At the end of the game, after playing through the 3 breaks and the in-between classes/meeting, the player is shown the feedback screen, accompanied by a score meter (see Figure 13).

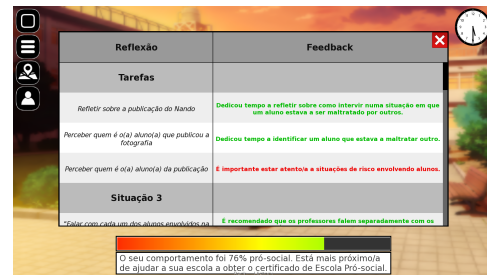


Figure 13: The end screen. The bigger the score, the more filled the meter will be. The player can also still access the other menus.

This score meter is calculated by attributing point values to each feedback remark, with each positive remark accounting for 1 point (2 if it was a task). It then is showed as a percentage of the total possible points that could have been acquired. Depending on the score, the player is met with a different feedback message.

3.7 Teacher Characters

There is another set of dialogues that was added later in the development of the game. They appear in every break, and they are composed of teachers instead of students. These teachers represent the work peers of the player. These dialogues are related to the cyberbullying situation, and give some extra information to the player, although since we still aimed to maintain the silent protagonist role, the player only listens to the conversation and does not interact with them. Currently, each break has one of these dialogues, and they are fixed in position, as in, they do not move between spaces like the students do.

In addition to these teachers, another teacher was added at the same time. This colleague was named Professor João, and he was the class director of class B (also 9th grade, composed of the remaining 6 out-group students), as well as being the school coordinator. This character was to become a sort of mentor for the player, as explained in the Tutorial subsection below.

3.8 Tutorial

To teach the player how the game works, we decided to create a session 0, a smaller session in length that introduced the player to all the mechanics of the game. To make it fit into the story, we designed the session as a flashback to the player's first day at the school, 2 years prior to the events of the main game. In this session 0, the player is taught how to move around the school, what each menu interface does, how to dialogue with characters and how to complete tasks. During the course of the tutorial, the player completes one type of task for each that exist, and through some dialogues, they get to know some details about the setting.

The player is also introduced to Professor João. He is presented as a more experienced professor, that was already in school before the player joined, and they've known each for some time. Also, since Professor João is the class director of class B (the out-group students), the player learns they can come talk to him to gain some information about these students. On top of this, as referenced

before, Professor João is the one the player goes to when they want to receive feedback on their actions and decisions.

3.9 Other features

Through the History button (located in the lower middle edge of the screen at all times), the player can check all dialogue lines that were presented up until that point. This feature was already given to us by the Ren'Py engine, with no need of coding on our part. The same goes for all the settings, and the save/load feature.

A simple logging feature was also implemented. This was used to record the actions of players for the facial validation. Every time a player interacted with a student, completed a task or started/completed a break, it would be registered to a file. This was done to have a quicker and easier way to compare the paths taken by the different players in the testing group, without needing to verify the entire recording.

4 EMOTION RECOGNITION VALIDATION

This validation was done to assess if the emotions portrayed in the game were realistic or if there were any outliers. The tool we used for the characters' faces provided only the facial expressions, and so, interpretation was made to select the appropriate expression for each of the emotions the character should be feeling at each point of the dialogue. The goal was to make sure a character's emotional status was not misinterpreted during the course of the game, given the context of the dialogue.

4.1 Participants

In this evaluation, there were 5 participants, 2 of which were males (40%), with 1 participant being a teenager, 2 being university students, and the remaining 2 being practicing teachers. Two of the participants had played the game before. All the participants volunteered to complete the required questionnaire, and in a single sitting.

4.2 Procedure

Each participant was given a questionnaire (see A in Appendix) to complete and fill, alone. The questionnaire was composed of an introductory page, stating the purpose of the project and instructions. Following that, there were 12 videos of recorded gameplay of the game, specifically the dialogues belonging to the story. The objective was to watch the videos, and for each character present in the dialogue, the participant was to describe how they thought the character's emotions or how they were feeling throughout the dialogue. The participants were instructed to answer with few words or simple expressions describing emotions or emotional states. There was the option of giving the participants a list of words they could choose from as answers, but we opted to make the questions all open-ended to allow better expression from the participants. Depending on the participants, the questionnaire took on average 40 minutes to complete.

4.3 Results

The goal of this evaluation was to check if there was a possibility of a portion of users misinterpreting the emotions of a character

for something that was completely different than what it was supposed to be. Since the participants answered with open answers, strict comparisons between the results are hard to make. On top of that, the participants were asked to not simply identify a specific emotion on a character, but how the character seemed to feel in general during the interaction. However, overall, the results were very compatible with each other. The participants all agreed on the emotional valence⁴ for all of the characters. There were some coinciding answers, like for example, Isabel in Video 3 and Patrícia in Video 9, where all users answered with a variation of the emotion "Concern". This was the most recognized emotion. One specific detail that was noted however was the fact that the participants were more accurate when describing the emotions of the characters if the characters changed their mood during the dialogue, than if they stayed with the same mood throughout. The exception to this was if the character showed happiness or a laughing face, where they identified it correctly, apart from two occurrences.

5 PROTOTYPE EVALUATION

To validate the initial prototype and concept of the game, we ran a test with the target audience of the game (practicing teachers). The goal was to understand how teachers perceived the game in the context of the project, to identify potential problems or oversights in the game design, and to get feedback and suggestions on things to improve on the game. This test was done in collaboration with Faculdade de Psicologia da Universidade de Lisboa (FPUL), with the participants volunteering to play test the game in a single session.

5.1 Participants

In this evaluation, there were 6 participants, 5 of which were males (83%), with ages ranging from 33 to 67 years. The 6 participants were teachers at the Centro Qualifica de Odivelas, who taught students of grade between 7th-12th. Five participants claimed they played video games occasionally when they had the chance, with four of them having knowledge of visual novel games. The single participant that did not play video games was not aware of visual novel games as well. Only two of the participants had previously been a part of a cyberbullying formative session.

5.2 Procedure

In the 23rd of June, at 17h30, a 90 minute session composed of 3 members of the project team and 6 participants was organized. We began by presenting the Te@ach4SocialGood project, as well as give a brief introduction to the game and what its purpose was, and requesting consent to record the session. The participants were then split in 3 groups of two people, with each group being supervised by a member of the project team. The participants began playing the first session of the game in pairs while being supervised (keeping intervention to the bare minimum, only when strictly necessary), with their gameplay screen being recorded, as well as their voices. At the end of the gameplay session, it was asked of the participants to each fill out an individual questionnaire (see B in Appendix). Afterwards, a semi-open interview was done with

⁴Categorization of emotions. Example: happiness and joy have positive valence, fear and anger have negative valence.

all the participants present, via a group discussion, which was also voice recorded.

5.3 Results

The results that follow are derived from the questionnaire the participants filled, and the post game group discussion. We had five main categories through which we evaluated the session: the global game experience, the learning aspect, its adaptability as a tool for teachers, its usability, and its fidelity.

Beginning with the global game experience, all participants claimed the game was innovative, and that the quality of the game was comparable to other professional-level activities. They found the “detective” role of investigating the cyberbullying case through the dialogues a different (in a positive sense) way to present this problem.

Moving to the learning aspect, all users were able to identify the purpose of the game, and the message that we aimed to communicate. Although there was some issues with the completion of the cyberbullying related tasks due to an unclear user interface, the users still managed to grasp the key subjects of the situation.

Continuing to the adaptability, the participants claimed it to be a very useful formative tool, better even when paired with other activities, like a post game reflection and discussion with peers. The fact that it was a serious game as opposed to a less ludic tool, it provided a very different and unexplored dynamic that could perhaps be much more effective than its counterparts; it allowed a less demanding approach to the user, while still keeping the educative content present.

Concerning usability, in terms of graphics and the art direction, the response was very positive, mentioning appealing character and space designs. However, one of the main concerns that was brought up by everyone was that the game did not teach the player how to play, and so, in the first few minutes of the game session all participants spent some time testing the controls and figuring out what the objective of the game was. This was expected to a certain degree, as one of the objectives of the evaluation was to see how intuitive the game was for the players without any specific guidance, either from the game itself or from the supervisors. The interface had some visibility issues, with users missing some important info. In particular, some users were getting lost due to not knowing the paths they had taken before and where rooms were located; although there was a map they could check, they had no knowledge of this. Additionally, they had some difficulties identifying doors and entryways. Concerning the tasks, they understood how they worked and did some of them, except the cyberbullying related ones because they did not understand they had to be manually completed. In terms of the reflection moments, a group of users had difficulty understanding the subject of the reflection, as in, if they were supposed to answer by thinking like a teacher or a student. In addition to that, they found the option of a “Don’t know” in the blackboard sections to be an “escape” answer, due to being applicable to most phrases depending on the context. Also, in the ordering blackboard section, some users were confused on what they were supposed to do. One group mentioned that although one of the characters had mentioned a bathroom during one of their dialogues, they looked for it and they never found it (there isn’t

one in the school layout). This brought some confusion because the character was mentioning they were going to a location that the player was unable to access, and they were given no specific reason. Some other observations that were made were more akin to grammatical errors and the sort, which do not need to be specified.

Moving on to fidelity, the users believed the overall story to be credible. Although the dialogues made use of slang and sometimes an aggressive tone, the consensus was that the way the students were presented was very realistic and in line with teenager behaviour. They also praised the different cultural/social status of the characters, making reference to the fact that the dialogues showed that the students had different aspirations and personalities, and that they weren’t bland and uninteresting. Some commentaries (in a non negative way) were made on the fact that usually a teacher does not gain so much information by listening to students, but at the same time, they understood that it was a game mechanic, and a way to present the metaphor. They also liked the fact that some dialogues were more intimate, and others more casual, and that it was successfully able to show the dynamics of the groups formed within the characters. On the negative side, they mentioned some characters were a bit stereotypical, which could cause an issue if it was a recurring theme (this specific feedback was expected because of the nature of the cyberbullying situation in the first session of the game). When it came to the tasks, they stated they were adequate, and properly conveyed what a teacher has to go through on a daily basis, and that the time generated pressure that resembled real life. However, some said this also came at a down side, because they got too concentrated on the tasks and lost focus on the situation. In relation to the reflection moments, the users felt that it was potentially a bit over dramatic, since a teacher keeps composure most of the time, and that a situation such as this wouldn’t make them feel what the game portrays.

A major point that all the participants noted was the fact that the game only presented the player as the single teacher present in the story. They were left wondering what was the relationship of the player with the students, as it was never explicitly stated in the game. They also mentioned that usually, teachers speak with their colleagues or a representative of the school about these type of situations. Added to this, they felt like the students should talk with the player sometimes, or with a teacher in general. A lot of the times, a teacher alone can’t solve these cases, and the users stated that most of the times one needs to communicate with their peers or their superiors about the situations before doing anything about them.

One part that was not commented as much as we expected was the feedback menu. Although the groups were exposed to it at the end of the game, they did not interact with it during the play session. This was largely due to them not knowing it existed as a mechanic, as well as the interface not being clear when a new feedback was added. This made it difficult to evaluate what they thought of the mechanic, and how useful it was.

In regards to the questionnaire, there were some valuable answers that were given. When asked about the most memorable aspects of the game, the most common topic was the dialogues (or a variation of such), followed by the graphics/realism. The remaining repeated answers were the tasks, the space navigation and the reflection moments. This coincided with our expectations

and what was said in the discussion, with the participants thinking highly of the way the game and situations were presented, as well as the content of the dialogues. Associated with this question, when asked about the most positive part of the game (from the answers given), each participant answered within these previous five topics. However, for the negative part, they mentioned the use of slang (mentioned previously), the lack of a way of checking previous dialogues (which at the time of the session was not explained explicitly), and the lack of orientation in the school (which could be solved by using the map, but as stated before, they did not know of its existence).

For the specific suggestions of the game, there were 3 main ideas. The first was to correct typos and the occasional bugs that occurred during the session, which was something that was expected. The second was to give instructions to the player, how their objective and how to play the game, as well as making the game easier to grasp for users who were not so adjusted to video games. And the third was to provide a way for the player to speak with peers, such as other teacher characters, during the game, as opposed to only being able to interact with students.

5.4 Discussion

With these results, we gained a lot of insight on where the game was good, and where it could be improved. In particular, we divided the work to be done in 4 main aspects that needed to be changed: the lack of other teacher characters in the game, the way the feedback was presented, the definition of the social and professional status of the player in the school, and the lack of guidance from the game to teach the players how to actually play. Modifications were made to the prototype that reflected these ideas (the addition of the tutorial, the change to the existence of more teachers (including Professor João), the solidification of the player's role, and other overall improvements), which culminated in this current version.

6 CONCLUSIONS

We created this game as a learning tool for teachers to better understand and improve their behaviour when faced with cyberbullying situations. Pro(f)Social is a visual novel game that intends to fill a missing gap in serious game targeted at adults, specifically teachers, with the objective of sensitizing its players to cyberbullying situations and to teach them how to deal with them in their job.

The premise of the game has been validated with a group of teachers, having received positive feedback on how impactful it can be. The situations were considered plausible, and the users found the game to have the potential to be a great formation tool.

With the feedback we got from our test participants, we will be able to develop the remaining 3 sessions of the game in the best way possible, and contribute to the field with the creation of a fully fledged serious game for teachers.

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A EMOTION RECOGNITION QUESTIONNAIRE

Video 0

<http://youtube.com/watch?v=1WRtpdxMCQ4>

1. Cármen _____

2. Manuela _____

3. Patrícia _____

Video 1

http://youtube.com/watch?v=bJSqzR_A5cs

4. Tatiana _____

Video 2

http://youtube.com/watch?v=Sam_cJA6vuM

5. Estrela _____

6. Samuel _____

Video 3

<http://youtube.com/watch?v=cDgZArFL03o>

7. Isabel _____

8. Tatiana _____

Video 4

<http://youtube.com/watch?v=NfamgMnu6w0>

9. Tatiana _____

Video 5

<http://youtube.com/watch?v=wn-HJip2x70>

10. Tatiana _____

Video 6

http://youtube.com/watch?v=x_kLDxadJV8

11. Cármen _____

12. Estrela _____

13. Hélder _____

14. Isabel _____

15. Samuel _____

Video 7

<http://youtube.com/watch?v=HIU8-wME6D0>

16. Jorge _____

17. Nando _____

Video 8

<http://youtube.com/watch?v=pj9OzZAAFGo>

18. Nando _____

Video 9

<http://youtube.com/watch?v=lZXW48GVJ-M>

19. Manuela _____

20. Patrícia _____

Video 10

http://youtube.com/watch?v=ZZ_kq05AfRk

21. Nando _____

Video 11

http://youtube.com/watch?v=rNQaw_ybETs

22. Jorge _____

23. Nando _____

Video 12

http://youtube.com/watch?v=qc4QM_pc_eY

24. Abel _____

25. Cármen _____

26. Estrela _____

27. Hélder _____

28. Manuela _____

29. Nando _____

30. Patrícia _____

B POST GAME QUESTIONNAIRE

1. Indique por favor:

Idade: ____ Sexo: _____ Anos de serviço: ____ Disciplina(s) que leciona: _____

Concelho: _____

Situação profissional: _____

Tipo de estabelecimento: Público / Privado

2. Com que frequência joga?

(Escolha apenas uma opção.)

Não jogo.

Jogo ocasionalmente quando a oportunidade se proporciona.

Reservo parte do meu tempo para jogar.

3. Qual a sua familiaridade com jogos onde a história desempenha um forte papel na experiência (por exemplo, visual novels)?

(Escolha apenas uma opção.)

Esse tipo de jogos não me são familiares e/ou não tenho uma opinião formada sobre os mesmos.

Já joguei/vi outros jogarem o suficiente para perceber que não aprecio esse tipo de jogos.

Já joguei/vi outros jogarem muitas vezes e gosto desse tipo de jogos.

4. Teve algum tipo de formação sobre cyberbullying?

Sim / Não

Se sim, de que tipo?

(Pode escolher mais do que uma opção.)

Webinar/Conferência

Curso de curta duração

Curso de longa duração

Workshop

Outro. Qual? _____

5. Considera que fez alguma aprendizagem durante o jogo? Se sim, indique a principal.

6. Considera que o jogo sério o conduziu a refletir sobre o cyberbullying? Indique em que medida.

1 (Nada)

2 (Pouco)

3 (Mais ou menos)

4 (Muito)

7. Que aspeto do jogo mais o ajudou a pensar sobre o cyberbullying? (Caso tenha escolhido o ponto 1 da escala anterior, avance para a próxima questão.)

8. Indique em que medida achou o jogo útil no âmbito de uma formação para professores sobre o cyberbullying.

1 (Nada)

2 (Pouco)

3 (Mais ou menos)

4 (Muito)

9. Indique em que medida achou o jogo interessante no âmbito de uma formação para professores sobre o cyberbullying.

1 (Nada)

2 (Pouco)

3 (Mais ou menos)

4 (Muito)

10. Indique cinco aspetos do jogo dos quais se recorda melhor:

1. _____

2. _____

3. _____

4. _____

5. _____

11. Dos aspetos que descreveu na resposta anterior, indique qual considerou mais positivo e porquê.

12. E qual considerou mais negativo e porquê?

13. Que sugestões tem em relação ao jogo?
