Animated characters in bullying intervention.

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Abstract. The VICTEC (Virtual ICT with Empathic Characters) project explores the use of animated characters in virtual environments for educational issues, such as bullying behaviour. 76 participants evaluated a prototype of the VICTEC demonstrator. Results revealed high story believability with character conversation rated as convincing and interesting whilst character movement was poorly rated. The results imply that poor physical aspects of characters do not have detrimental effects on story believability and interest levels.

Introduction

A range of intervention strategies to counteract bullying problems in schools have been developed [1, 2] however, it remains unclear as to how children can be provided with strategies to cope with bullying [3]. Virtual Learning Environments (VLEs) populated with Intelligent Virtual Agents (IVAs) offer children a safe environment where they can explore and learn through experiential activities [4]. IVAs offer a high level of engagement, through their use of expressive and emotional behaviours [5, 6], making them intuitively applicable for exploring issues such as bullying.

VICTEC (Virtual ICT with Empathic Characters) is a European funded Framework V project which aims to apply synthetic characters and emergent narrative to Personal and Social Health Education (PSHE) for children aged 8-12 through using 3D self-animating characters to create improvised dramas in a virtual school. The demonstrator being developed within the VICTEC project provides a school-based VLE populated by IVAs representing the various characters in a bullying scenario.

The question that we are seeking to study is does a VLE populated with IVAs provide a suitable mechanism to explore bullying within the context of a formal educational environment. At this stage our interest lies not in the evaluation of the IVAs but rather in determining whether the demonstrator has potential as a software product for

teaching and learning about bullying within PSHE. This issue was considered through evaluating the demonstrator using a trailer (single episode from a bullying scenario).
Section 1 describes the VICTEC demonstrator and the trailer script. Section 2 describes the experimental design. Section 3 presents the results. Section 4 discusses the results and their implications for future work.

The VICTEC Demonstrator

The VICTEC demonstrator provides a testbed for the design of scenarios, characters and user interaction capabilities. Version 1 of this demonstrator consists of a web page with an embedded Wildtangent (WT) Plugin(R), allowing a 3D environment within the browser through the execution of an applet also embedded in the webpage.
The character's emotional behaviour is transmitted through predefined animations and pre-recorded audio (using actors' voices). Dynamically modified textures express the character's facial expressions and current emotional state.

The Trailer Script

The script of the trailer is a single episode from a scenario about bullying behaviour. It begins with an introduction to the main characters. A physical bullying incident occurs between Luke (the bully) and John (the victim), followed by Luke verbally abusing John. John initiates discussion with the user about possible coping strategies for the incident (fight back, ignore him, tell the teacher or parents) and the user selects the strategy that they believe will be the best for John to deal with the situation.

Experimental Design

An 8-section questionnaire was developed to evaluate aspects of the VICTEC bullying demonstrator (character preference, realism, voice, conversation content, movement, school environment and match with characters, story plot and length, user feelings and satisfaction) mainly measured using 5 point Likert scales.
The questionnaire was administered at a ChildLine conference after the demonstrator had been presented to delegates as part of a seminar regarding the nature of bullying behaviour in schools. Participants watched the presenter interacting with the demonstrator using the trailer episode. 76 questionnaires were completed.

Results

The results of the questionnaire were analysed by examining frequency distributions for questions that employed Likert scales using Histograms. Chi-square tests as cross-tabulations were calculated to determine relationships between different variables.

Sample Description

19 male (25.3%) and 55 female (73.3%). Age: range 10 to 55, mean age of 33.83 (SD: 14.98); skewed distribution, with almost half over 40. For analysis purposes, participants were categorised into 3 age groups, 10 – 18, 19 – 40 and 41 – 55.

Cartoon vs Realism

51% favoured cartoons, 49% favoured realistic. Younger participants preferred cartoon characters (70.6% compared to 36.8%). The 19-40 group had a slight preference towards cartoon characters. The 40+ group preferred realistic characters (63.2% compared to 29.4% in 10-18 group). No association between gender and a preference for cartoon or realistic characters.

Character Preference

No one character was preferred in general. None of the participants within the VICTEC age range (8 – 12) least preferred John (the victim). There was a significant bias (Chi square = 7.82, df: 2, $p = 0.02$) towards not preferring Luke (the bully). In the 40+ age group 50% preferred Luke (the bully), whilst 22.7% preferred John (the victim). With Martina (neutral) no preference was revealed in all groups

Physical Aspects of the Characters

71% of respondents rated the likeability of the voices as neutral or dislikeable, with a trend towards the voices being unbelievable (mean rating 3.3, SD: 0.87) and dislikeable (mean 3.0, SD: 0.91) with 30% of users reported disliking the voices. 84% of respondents found the agents' movements unbelievable, (mean 3.7, SD: 0.99), 88% found the agents' movements unrealistic (mean 3.8, SD: 0.91), 89% found the agents' movements jerky (mean 3.7, SD: 0.99). Significant finding between voice acceptability and character movement (chi-square = 13.34, df = 4, $p = 0.01$) indicating association between the acceptability of character movements and voices. Users who found character movement unacceptable also had low acceptance of character voices.

Story Believability and Comprehensibility

68% of respondents found the storyline believable. No age or gender differences. No significant relationships between story believability and acceptability of character voices or movements, with a small trend towards higher story believability if character voices were found to be average or acceptable rather than unacceptable. Significant association between story believability and match between character appearance and school environments modelled (chi-square = 10.62, df = 2, $p = 0.01$). 65% of children reported high story believability if the characters and school

environment were highly matched compared to 35% who found a low match between school environment and characters and high story believability.

Agent Conversation

Agents' conversational content was rated as highly believable by 75% of respondents (mean: 2.2., SD: 0.79). 52% found the conversation highly interesting (mean 2.5, SD 0.89); and 61% found the conversation true to life (mean 2.3, SD 0.94). Aggregated scores (believable, interesting, true to life) for what the agents talked about received high scores for 73% of respondents, 16% found it average and 11% found it unbelievable, boring and false. No significant differences for gender and age.

Discussion

There was a lack of differentiation through gender throughout our results although we had anticipated gender differences, following [9]. There was some differentiation due to age, but this tended towards trends rather than significant indicators.

Although no one character was preferred overall, there was significant age bias in character preference that can be suggested to be dependant on the character's role within the scenario. In support of this, Martina (the narrator) was frequently rated neutral, whilst for the target age range John (the victim) was never rated as the least liked which suggests that the children are engaging and empathising with the characters. The target age group did not like Luke which is a surprising result as Luke had 'cool' characteristics, self confidence and a peer network supporting his actions. However, we suggest that this dislike related to the child users' understanding of the deceptive skills that Luke was employing. Surprisingly, we found almost the opposite results for adults in the 40+ range. One suggestion could be that Luke is portrayed as being an intelligent, bubbly individual whilst John is portrayed as a nervous, anxious outsider and thus Luke is more likeable, at least from an adult perspective.

Comprehension of the story was good, with only 11% selecting an incorrect response. Most respondents found the story script believable and the content of the storyline highly interesting and true to life, with an overall acceptability rating of 73%.

The results relating to the physical aspects of the characters were disappointing. The majority of users found the movements unbelievable, jerky and unrealistic and a similar view was held of the voices. Yet, what is perhaps more interesting, is that the believability, likeability and so on of the physical aspects of the characters appears to have limited impact on the story comprehension and believability, with only a small trend observed for voice acceptability and story believability. On the other hand, the believability of the story line or plot is strongly related to both the attractiveness of the visual environment and its match with the characters, suggesting a need for coherence and consistency with real world situations.

When we initially used the trailer approach (seminar, interactive demonstration, discussion period) we were uncertain as to how successful this would be. The responses obtained provided useful insights, particularly from groups that are difficult to gain exposure to in large numbers (e.g. teachers). Work on the trailer will continue

involving an increase in the repertoire of episodes. We intend to use this approach at future conferences and with different user groups to obtain a range of user perspectives with the aim of feeding these into the design process.
The limitations of the trailer approach for gaining primary user data are apparent. We recognise the need to take the VICTEC demonstrator to schools and carry out some randomised control studies to gain a deeper understanding of the impact that it may have on children's understanding of bullying and subsequent behaviour. This future evaluation will be conducted in the first quarter of 2004.

Conclusions

The overall conclusion is that even at this early stage, the VICTEC demonstrator appears to provide a suitable mechanism for the exploration of bullying issues. Whilst some of the results may appear less favourable, particularly those related to agent physical characteristics, this does not seem to have any detrimental effects on the comprehensibility and believability of the story. It is possible to suggest that the users transpose their own feelings onto the characters: 'getting under the agents' skins' and 'filling in the gaps' left by technology.

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