Chapter 11
Quantitative Analysis of Voice and Keyboard Chat in a Paper Presentation Seminar in a Virtual World

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ABSTRACT

To investigate the possibilities that are offered to improve teaching within a virtual environment, chat recordings from a paper presentation seminar in a virtual world were analyzed. A total of 9 sessions with more than 500 minutes of recordings from 19 participants were classified in diverse categories by two independent coders. The channel used (voice or keyboard) as well as other attributes of the contributions, the contributors, and the sessions were coded. Results show that the voice channel was mainly used for relevant contributions, while the keyboard channel contained mainly irrelevant contributions. The longer a session was the lower was the percentage of irrelevant contributions, $p < .05$. Gender and previous experience with digital games are both highly correlated with the percentage of irrelevant contributions, $p < .01$. Technical and personal factors are related to the rate of irrelevant contributions, while situational and relational factors seem to have a minor impact.

INTRODUCTION AND BACKGROUND

Educational games and game-based learning are becoming more and more relevant for instructional design and formal education (for example, see Prensky, 2001; Squire, 2003; Felicia, 2011). When a classical paper presentation seminar is held in a virtual classroom or virtual world, new communication options can arise. In the present chapter (for an in-depth description of the approach, see Bösche & Kattner, 2011), oral paper presentations and discussions in a university seminar were carried

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out using a digital game that allowed for voice and keyboard chat simultaneously over the internet. The course topic was the psychological impact of violent video games and included learning in virtual environments. An internet multiplayer game was applied encompassing comprehensive communication features and both violent and non-violent interactivity of the players with each other as well as the environment. Except for the scientific background literature that was downloadable from a learning management system, all content was delivered through the game itself: All presentations and discussions took place in the game, and many phenomena discussed were directly demonstrated to and were experienced by the students in the game itself. The game served as a virtual classroom for all these matters.

Beyond the classical paper presentations held via voice chat, accompanying missions for the game were designed to demonstrate the crux of the matter in a playful style (called "action-oriented exams"). This included both real world procedures well known to the participants such as map reading and vehicle driving as well as rather uncommon ones like flying a helicopter and complex missions with different roles needed like emergency rescues or freeing hostages. This way, participants were able to compare their known real world experiences with virtual ones and directly evaluate the relevant psychological theories that were told to them in the lessons in a comprehensive virtual world. Furthermore, participants could reflect on learning in general and especially on the perception and learning of aggressive associations, thoughts, and behavior in a virtual environment in a depth that would hardly have been possible without the interactive experience. This was in order to give all participants, also those without prior experience in digital games, the opportunity to reflect the rather abstract theoretical principles of learning in digital games with lucid experiencing for themselves directly within the medium.

Whilst in a classical classroom setting, there is only one shared communication channel: The voice. Typically, this channel is explicitly or implicitly moderated, especially in discussions, such that the channel isn't overloaded, and most of the time only one speaker is talking. This resembles - especially in the virtual world and the settings used (only one voice communication channel that is equally shared by all participants alike, but moderated by the lecturer) – a centralized communication structure called a "star" (Leavitt, 1951). Mainly, the lecturer monitored, moderated and therefore decided who was allowed to speak to the class in which situation. However, technically it was possible for everyone to start speaking (or yelling) while another had the floor. Therefore, the student that had the floor could decide to stop talking or go on talking, producing a collision in the voice channel. All speakers that pressed the corresponding key were heard in the channel simultaneously (but it was very hard to understand anything if multiple persons spoke at the same time). Though it never occurred, it was clear to the participants that destructive behaviors like filling the voice channel with unwanted noise would result in sanctions. The communication guidelines given out in advance clearly stated that disturbing or abusive behavior would result in being "kicked out of the session and maybe even banned from the server". Such a communication structure is most satisfying for the leader of the group (the lecturer), but not for the other participants. On the contrary, a fully interconnected circle structure where anyone can address everyone without having to request for permission to talk and being admitted to the floor, raises satisfaction levels for all participants (Leavitt, 1951).

The voice channel of the virtual world was used like it is used in a traditional classroom setting, and corresponding communication protocols like signaling if someone wants to be admitted to the floor were applied to the voice channel in the virtual world. Rules of communication were given out in advance, which addressed the gestures and communicative possibilities of the game.

Additionally to the voice channel, a keyboard channel was available for all participants. When such an additional and independent channel is