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— a serious game for
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Demo: Communicate!

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Abstract. Communicate! is a serious game for practicing communication skills. It supports practicing interpersonal communication skills between a health care professional such as a doctor or a pharmacist, or a (business) psychologist, and a patient or client. A player selects a scenario, and holds a consultation with a virtual character. In the consultation, the player chooses between the various options offered in the scenario. The player scores on the learning goals addressed by the scenario, and gets immediate feedback through the effect of the choice between the answer options on the utterance and emotion of the virtual character. Communicate! not only offers a playing environment, but also an editor for scenarios. A scenario is a graph-like structure, extended with several constructs to avoid the development of repetitive structures. For example, a teacher can specify two discussions about separate subjects, and allow the player to take steps from both discussions in arbitrary order. We have performed several experiments with Communicate!, both with students to evaluate the use of Communicate! in various programs at Utrecht University, and with teachers to evaluate the development of scenarios for Communicate! In this demonstration, we show the Communicate! game, the scenario editor, including the constructs for defining scenarios, and we report on the experiments we have performed.

Good communication skills are essential for health care professionals such as doctors [8] and veterinarians [2], and (business) psychologists. At Utrecht University the programs Psychology, Medicine, Veterinary medicine, and Pharmacy offer introductory communication skills courses, in which yearly about 1500 students practice and learn communication skills. Practicing communication skills is labour-intensive and requires quite a bit of organisation: students practice in pairs, together with an observer, or a student practices with an actor, again together with an observer. To offer better possibilities for practicing interpersonal communication skills between a health care professional and a client we have developed Communicate!, a serious game for practicing communication skills.

In Communicate!, a player selects a scenario, and holds a consultation with a virtual character. See Figure 1 for a screenshot of the game. For example, Communicate! offers scenarios for practicing dispensing drugs to a client for the



Fig. 1. Screenshot of a consultation in Communicate!

first time, and for bad news consultations. In the consultation, the player chooses between the various options offered in the scenario. For example, in the bad news consultation the player can choose between amongst others :

1. Rita, I'd like to discuss something with you, but first I want to make sure you won't get angry.
2. Rita, I have bad news for you. I'm very sorry, but I think it is better if you are treated by another psychologist.

The player scores on the learning goals addressed by the scenario, which in this case are clarity and empathy, and gets immediate feedback through the effect of the choices on the utterance and emotion of the virtual character, which in this case are anger, fear, contempt, and happiness. For example, if the player chooses the first option, Rita responds defensively, and Rita's fear, anger, and contempt increase. The player scores negatively on empathy and clarity. The second choice is the preferred one [5], and although Rita reacts angrily, the player scores positively on empathy and clarity.

After playing a scenario, a player gets feedback in the form of a score on the various learning goals of the scenario, and the consultation annotated with textual feedback at the choices the player took.

Scenarios

To use Communicate!, teachers need to develop scenarios that fit their curriculum. The teachers have various requirements for the development of scenarios:

- fine control over the form and structure of the consultation
- avoid repetition in the scenarios as much as possible

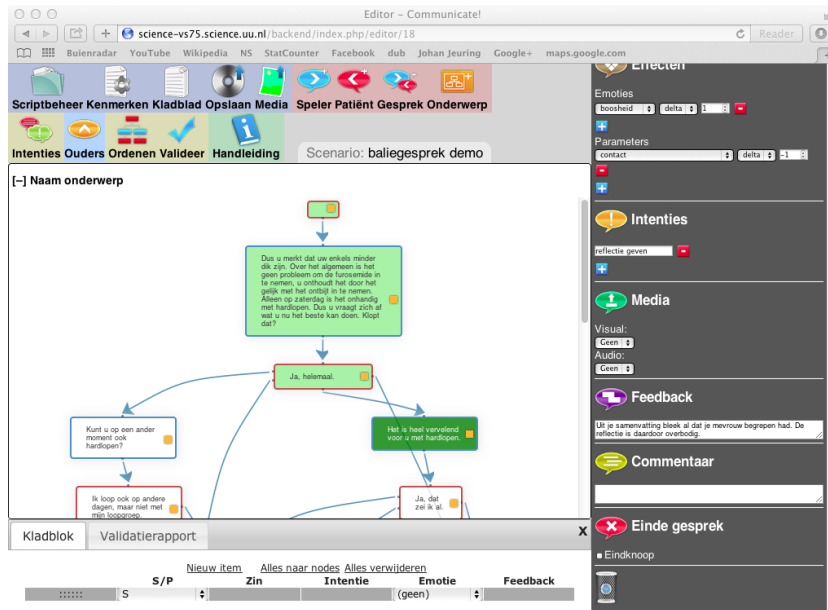


Fig. 2. Screenshot of the scenario editor for Communicate!

- annotate each choice in the scenario with scores on the learning goals, emotional effect on the client, and feedback to the player

For this purpose, we developed a scenario editor for Communicate!, see Figure 2. A teacher specifies the learning goals of a scenario, selects a virtual character, and then develops a graph-like structure for the consultation. In the scenario, a teacher can specify a sequence of choices for the player, but also:

- conditions under which certain options are offered or not,
- parts of consultations that may be interleaved in any order,
- or that a (part of a) consultation may be stopped at any point.

In the leaves of the graph are sentences, and the choices of the player are annotated with scores on learning goals and emotions of the client. A scenario developer can choose to replace the text of the client by audio.

In the back-end of the game we use a so-called domain reasoner [4, 3] for scenarios to calculate the choices for the player. We chose to use a domain reasoner for scenarios instead of dialog trees [1] or a virtual agent approach using the belief-desire-intention approach [6] because teachers want to have very fine control over the form and structure of the consultation, and to avoid repeating subtrees of scenarios as much as possible.

Experiments

To evaluate the current version of the tool, and obtain requirements for how to

improve it, we performed several play tests and small experiments with Communicate! In april 2014 we compared three different interventions using Communicate! with 42 pharmacy students: play individually with no introduction, play individually after a brief introduction, and play in teams after an introduction. Later in 2014 we tested a rational emotive behavior therapy scenario and a bad news consultation with 9 psychology students. On March 13, 2015, we organised a think-aloud session with 5 veterinary medicine students: one individual, and two pairs. Besides with students, we performed several tests with health care professionals, and with several other ad-hoc groups of people. Students generally see added value in the game, and say things like: "This is much better than watching videos, because I really have to practice here," or "Nice to see how a patient reacts on the choices I make". Their main comments are related to recognizing the emotions in the client, and to the form and structure of some of the scenarios, which sometimes force a player in a particular direction, or which are set up to encourage discussions. The teachers think that the discussions after playing the scenarios are very fruitful.

Conclusions and Related Work

We have developed a serious game for practicing interpersonal communication skills between a professional and a client. When playing a scenario, the choices of the player have an effect on the utterances and emotions of the virtual client. This distinguishes Communicate! from for example the Keele Active Virtual Environment [7], which does not deal with emotions.

We have also developed a scenario editor that supports the easy development of scenarios for the game. The distinguishing features of the scenario editor are the fine control offered over the structure and form of scenarios, and the several constructs for avoiding repetitive work in the development of scenarios.

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