Deminstrating Empathy in a Learning Mentor Agent

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Abstract. The paper presents a case for investigating the ability of companion agents to demonstrate cognitive empathy and describes planned research.

The Problem

Agents that can take part in social relationships with real people are increasingly important [1], not least in the field of e-learning. As such agents have the potential to become more and more life-like it is important to consider which characteristics have a positive effect on the outcomes of the activity in which they play a part. Thus, in the case of e-learning, we are interested in those characteristics that will lead to more effective learning in terms of results. Our particular interest is e-learning that takes place in a self-determined learning environment where the learner will frequently be studying on their own and hence the need for a learning companion or mentor is indicated, to encourage and to provide feedback.

Among the qualities required of real-life mentors [2] is the ability to develop a good relationship with the learner, a key aspect of which is an ability to demonstrate empathy; there is no reason to suppose that the requirements for a learning mentor agent are different. Empathy is a critical skill in tutoring, coaching, mentoring, and in the whole range of 'helping' therapies.

Defining empathy is difficult, even in the discipline of psychology, because the term “is routinely used to refer to two distinctly separate phenomena, cognitive role taking and affective reactions to others.” [3], so it is not surprising that similar ambiguity exists in researching conversational agents where a “somewhat looser conception of empathy used in the agent community (is) called involvement” [4]. Davis [3] describes role taking or perspective taking as “the attempts by one individual to understand another by imagining the other’s perspective”.

Considerable research has focused on emotional empathy, where it is now possible to sense the affective state of the live player and respond with appropriate empathetic agent reactions [5,6]. Where dialogue has been involved, the focus has still been on affective empathy; for example, Burleson & Picard [7] used active listening [8] to identify levels of frustration.

Cognitive empathy is concerned with being able to understand the other’s thoughts and associated mental map, the other’s perspective. It involves content and is usually demonstrated by the listener being able to summarize and reflect, correctly, what has been heard i.e. using active listening. Demonstrating empathy is essential because without it, the subject could be assuming that they have been understood and that may not be the case. Learners need to know, not just that their feelings are recognised, but that the reasons why they are having problems are also understood. This research is concerned with demonstrating cognitive empathy, and determining its effect on learning outcomes.

Current research into empathic agents uses sensors to detect the user’s affective state. In ‘low-tech’ e-learning, having no sensing capability, it will be more difficult to produce a mentor agent that can demonstrate cognitive empathy, yet this is likely to be a significant factor in achieving effective learning.
Research aims & Objectives

I. Can cognitive empathy be demonstrated by a learning mentor agent in a non-sensing e-learning environment?
II. Does using a learning mentor agent that demonstrates cognitive empathy lead to more effective learning than using a non-empathetic agent?

Methodology

The research will use a multi-branched simulation in which the learner acquires coaching skills through coaching a conversational agent. The conversational agent simulates an employee in need of help. The learner is presented a series of options at each stage, using a keyboard to input each choice, until a solution is reached. A second agent acts as a learning mentor, to provide guidance when requested, to provide feedback as the simulation progresses, and to intervene if the subject appears to be lost. Two versions of the simulation will be used, one in which the mentor demonstrates cognitive empathy verbally in addition to providing essential information, and one where the mentor provides information only, and no cognitive empathy.

The participants will be 40 managers in a nation-wide multi-site company (the e-learning topic is coaching skills for managers, and it might be assumed that managers will have an intrinsic motivation to use the simulation to gain skills) with each site having access to only one version of the software. A questionnaire will be used to determine whether the subjects felt that one mentor was more empathic than the other (aim I) while assessment of learning (aim II) will be through written pre- and post-tests of coaching skills, which will be assessed by experienced coaches.

Contribution to AIED

A learning system that cares must be able to demonstrate the use of the ‘soft’ skills such as empathy; they are not only important subjects in their own right, but should also utilised by agents employed in learning-related roles such as tutors or mentors, to deliver guidance and feedback to learners. To date research on empathic agents has concentrated on the affective but cognitive empathy is at least as important to the learner. This research will contribute to that end.

References