

Virtual training and coaching of health behavior: Example from mindfulness meditation training

Eva Hudlicka^{*}

Psychometrix Associates, Inc., Blacksburg, VA, USA

ARTICLE INFO

Article history:

Received 6 September 2012

Received in revised form 8 May 2013

Accepted 11 May 2013

Keywords:

Virtual coaches

Mindfulness

Health behavior coaching

Adaptive training

Adaptive coaching

Affective adaptation

Embodied conversational agents

ABSTRACT

Objective: Computer-based virtual coaches are increasingly being explored for patient education, counseling, and health behavior training and coaching. The objective of this research was to develop and evaluate a Virtual Mindfulness Coach for training and coaching in mindfulness meditation.

Methods: The coach was implemented as an embodied conversational character, providing mindfulness training and coaching via mixed initiative, text-based, natural language dialog with the student, and emphasizing affect-adaptive interaction. (The term ‘mixed initiative dialog’ refers to a human-machine dialog where either can initiate a conversation or a change in the conversation topic.)

Results: Findings from a pilot evaluation study indicate that the coach-based training is more effective in helping students establish a regular practice than self-administered training using written and audio materials. The coached group also appeared to be in more advanced stages of change in terms of the transtheoretical model, and have a higher sense of self-efficacy regarding establishment of a regular mindfulness practice.

Conclusion: These results suggest that virtual coach-based training of mindfulness is both feasible, and potentially more effective, than a self-administered program. Of particular interest is the identification of the specific coach features that contribute to its effectiveness.

Practice implications: Virtual coaches could provide easily accessible and cost-effective customized training for a range of health behaviors. The affect-adaptive aspect of these coaches is particularly relevant for helping patients establish long-term behavior changes.

© 2013 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

The past decade has witnessed an increased interest in the use of embodied conversational characters (ECAs) [1] as virtual coaches. These coaches provide assistance, training or coaching support across a variety of contexts; e.g., virtual coach Laura’s exercise coach that helps users establish and maintain an exercise program [2], advisors for patients with specific medical conditions (e.g., agent Greta who provides advice about eating disorders [3]), and virtual counselors to provide problem-solving skills training and emotional support for caregivers [4].

In this paper we describe an ECA virtual coach that provides mindfulness meditation training, and the coaching support necessary to begin a regular practice, via a web-based application. The coach is represented as a female character, capable of showing a variety of affective and conversational expressions, and interacts with the user via a mixed-initiative, text-based, natural language

dialog. The coach adapts both its facial expressions and the dialog content to the user’s learning needs and motivational state. Findings from a pilot evaluation study indicate that the coach-based training is more effective in helping users establish a regular practice than self-administered training via written and audio materials.

Below we provide background information about mindfulness and embodied conversational characters. The remainder of the paper then describes the Virtual Mindfulness Coach prototype, the empirical evaluation study, and the findings regarding the coach’s effectiveness. The paper concludes with a discussion of technical challenges in creating effective virtual coaches, focusing on their multi-modal interaction capabilities and social and affective realism.

1.1. Mindfulness meditation

Mindfulness is best described as a state of awareness characterized by “full attention to, and awareness of, the internal and external experience of the present moment” [5], and a non-judgmental attitude toward whatever thoughts, images, feelings or sensations enter awareness. A typical mindfulness practice session lasts about 20 min. The meditator sits in a comfortable position,

^{*} Correspondence address: Psychometrix Associates, Inc., 1805 Azalea Drive, Blacksburg, VA 24060, USA. Tel.: +1 413 207 7066; fax: +1 413 549 0357.

E-mail address: hudlicka@ieee.org

and begins the session with a concentration practice, by focusing his/her attention on some fixed, concrete entity, usually the breath, followed by mindfulness practice proper, where the meditator observes whatever emerges into consciousness, with full, non-judgmental awareness. Regular practice usually involves 20–30 min, done once or twice daily.

Regular practice of mindfulness meditation is associated with a number of health benefits. Evidence from existing studies indicates that mindfulness practice enhances health-related quality of life, affecting both physical and psychological symptoms [6,7]. Benefits of mindfulness meditation have been demonstrated in stress reduction [8], pain reduction [9], enhanced immune responses [10], reduction of symptoms in anxiety disorders [11], prevention of relapse in major depression [12], improvement in a subjective sense of well-being [13], and improvements in cognitive functions [5].

In spite of these benefits, the relative ease of learning mindfulness techniques, and no costs associated with their practice, use of mindfulness meditation remains limited. This is due to several factors, including lack of adequately trained healthcare providers, lack of access to teachers and training programs, cost of training programs, misconceptions about the methods involved, and difficulties with establishing a regular practice.

The Virtual Mindfulness Coach prototype described here was developed to address this problem, and to provide increased access to mindfulness training and coaching. The coach mindfulness training content is based on a widely used mindfulness training program, the Mindfulness Based Stress Reduction (MBSR) [14]. The mindfulness meditation training consists of 4 lessons, with one lesson administered each week during the 4-week training period. Each lesson focuses on a specific topic, and the 4 lessons together are designed to provide a solid introduction to mindfulness techniques, address common problems beginners encounter (e.g., restlessness, boredom), and suggest how to integrate mindfulness into daily life.

1.2. Embodied conversational characters and virtual coaches

Virtual coaches use the emerging technologies of embodied conversational agents (ECA's) [1], and relational pedagogical agents [15]. ECA's are animated virtual characters, displayed on a computer or a mobile device screen. ECA's play the roles of teachers, mentors, advisors, social companions, and, increasingly, of virtual coaches [16–20]. The use of ECA's requires minimal or no training, due to their capability to engage in natural interaction with humans through dialog and non-verbal expression. The latter includes facial expressions, gaze, and gestures, which together help control conversation flow and augment the ECA's visual and behavioral realism. Relational pedagogical agents represent a subset of ECA's, designed both to train a particular subject or skill, and to develop the type of a longer-term relationship with the user that helps facilitate coaching [21]. The use of ECA's and relational pedagogical agents has recently begun to be explored in healthcare settings, where these virtual entities act as coaches, trainers, and counselors.

Both the visual appearance and the multi-modal interaction capabilities of these characters vary greatly. The embodiments range from cartoonish, animated characters or faces, to fully articulated full bodies. The interaction capabilities range from text-based, multiple-choice user input and text-based character output, to speech recognition and synthetic speech. The virtual characters also vary in the degree to which they can adapt to the user's knowledge, affective and motivational state, and display affective and social realism.

2. Methods

The Virtual Mindfulness Coach is implemented as an embodied conversational agent, “Chris”, who guides the student through the training material, and provides supportive coaching to help students establish a regular mindfulness practice (see Fig. 1).

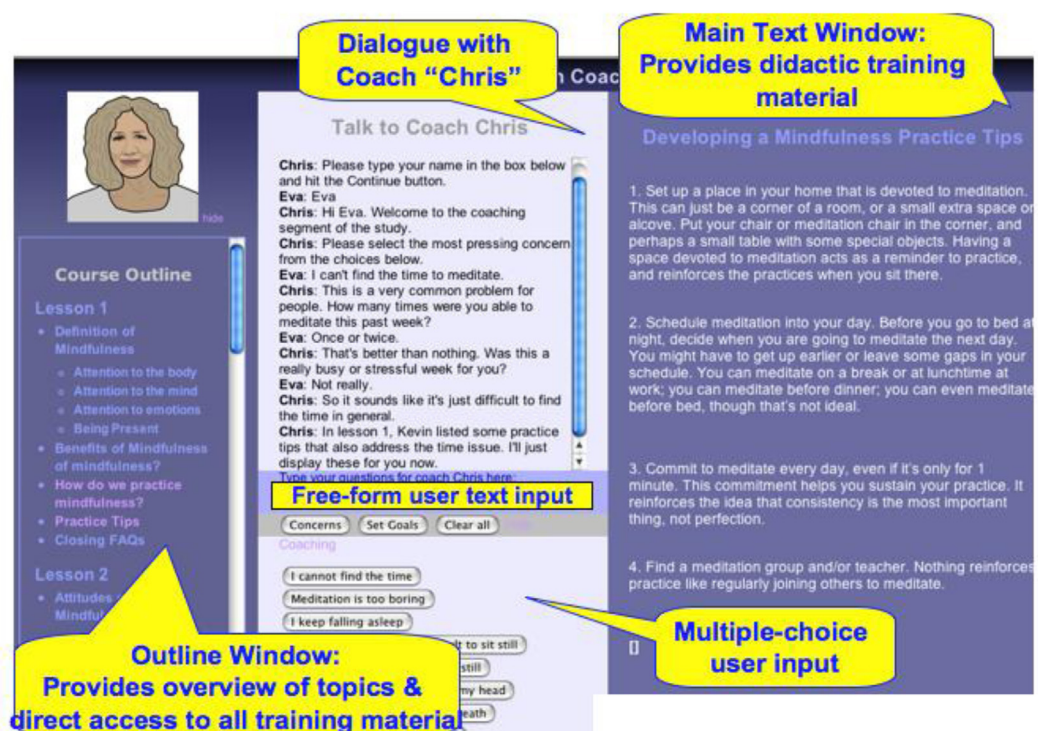


Fig. 1. The Virtual Mindfulness Coach user interface.

Download English Version:

<https://daneshyari.com/en/article/6153117>

Download Persian Version:

<https://daneshyari.com/article/6153117>

[Daneshyari.com](https://daneshyari.com)