Chapter 21
Adapting Chatterbots’ Interaction for Use in Children’s Education

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ABSTRACT
The Web is providing greater freedom for users to create and obtain information in a more dynamic and appropriate way. One means of obtaining information on this platform, which complements or replaces other forms, is the use of conversation robots or Chatterbots. Several factors must be taken into account for the effective use of this technology: the first of which is the need to employ a team of professionals from various fields to build the knowledge base of the system and be provided with a wide range of responses, i.e. interactions. It is a multidisciplinary task to ensure that the use of this system can be targeted to children. In this context, this chapter carries out a study of the technology of Chatterbots and shows some of the changes that have been implemented for the effective use of this technology for children. It also highlights the need for a shift away from traditional methods of interaction so that an affective computing model can be implemented.

INTRODUCTION
The first created system that simulated a conversation in natural language was ELIZA (Weizenbaum, 1966). Following this, “dialogues machine” or “Chatterbots” began to be developed for various applications. On the Internet, Chatterbots can be found in chat rooms, and online stores to help consumers, as well as being used by tutors in distance learning systems, FAQ’s, Web searches, etc. (Mikic, Burguillo, Rodríguez, Rodríguez & Llamas, 2008).

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With the increasing use of conversational robots in the WEB, a new form of communication is becoming evident, which is supplementing or replacing other forms of access to information. This can now be conducted by means of direct answers to questions asked by the user through a coherent dialogue.

This form of communications is applicable as a new way of accessing information and can assist in online teaching and learning activities, by reducing the feeling of isolation and dealing with users in a more personal way. Chatterbots is responsible for making the environment more attractive and dynamic and is called the Virtual Companion of Learning.

When a dialogue is conducted through a textual medium, one can lose important aspects of the speech, and this can lead to the meaning of the message being misinterpreted (Jaimes & Sebe, 2007). In view of this, there is a need to use mechanisms to assist in the interaction between the user and chatterbot.

The concept of Embodied Conversational Agents (ECA) was developed to meet this need. These are animated agents (in this case, chatbots) who act out the dialogue through speech, facial expressions, gestures, intonation and other non-verbal methods, to simulate the experience of a face-to-face conversation between humans, that can allow a relationship of trust to be established between both parties (Bickmore & Cassell, 2001).

When considering how to use this type of system for children, one concern is with making it appropriate to the age of the users, since it is often necessary to adjust the language used and employ strategies to encourage interaction with this type of communication. In attempting to do this, the systems adopted for this audience must follow human behaviour, so that it can be incorporated in the activity; this is important since technologies become invisible as they become familiar (Kenski, 2008).

The aim of this chapter is to introduce the changes that are needed to enable Chatterbots to be used for children. This can only be achieved by making a change in the user-system interaction and creating a model of Affective Computing, which uses computational models of emotion and personality.

To test the proposed changes, a prototype was devised to assist in the prevention of cardiovascular problems in children. The stages followed in constructing the model were supervised by two psychologists.

BACKGROUND

In an article “Computing Machinery and Intelligence”, Alan Turing (1950) discusses the possibility of devising a thinking machine. He put forward a simple test to evaluate the “intelligence” of the machine, if a human interviewer cannot tell whether he is talking to a person or a machine, and they are indistinguishable, the machine should be considered to be intelligent. This form of assessment is called the “Turing Test” (or “Imitation Game”). In this section, we will outline the technology that has emerged from the “Imitation Game”, the techniques used in developing this type of system, and also how the user-system interaction operates.

Chatterbots

Although there have been numerous criticisms of the test proposed by Turing (eg, Searle (1980) by means of the theory of the “Chinese Room”), countless dialogue systems have been developed with the aim of “passing the Turing Test.” These systems are currently known as Chatterbots (or chatbots—dialogue robots), and various techniques of Natural Language Processing and Artificial Intelligence are employed in their implementation (Schumaker & Chen, 2010).

The first Chatterbot recorded in literature was ELIZA (Weizenbaum, 1966). Weizenbaum demonstrated how a simple computer program