



Virtual Assistants and Its Implementation in the Teaching-Learning Process

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Abstract. Nowadays, technological advances encompass realities that in the last century were possible just as fantasies. Society lives now in a technological era where education must look for the path and tools to get the benefits that these advances offer, as well as the technological innate abilities that have been developed in students of this generation, who have been nominated as digital natives. For 2017 the capacities and use of virtual assistants have been significantly expanded, new products are offered in the market, although, these assistants are sub-used with basic functions solely, not taking into account the offered benefits. The present work aims to describe the different virtual assistants that could be used as an educational tool contributing to the teaching-learning process.

Keywords: Virtual assistants · Artificial intelligence · ICT · M-learning · Teaching-learning process

1 Introduction

From the emergence of ICT and the incorporation of them into the educational field there have been new challenges to be created and not just for the production, representation, diffusion, and access to knowledge, but also in innovating constantly and generate new learning conditions in environments which are not the conventional ones, offering chronic and asynchronous communication [1].

The availability of technological devices variety inserted in the teaching-learning process offer a high-range of possibilities to the professor of the XXI century, to generate learning that responds to the actual reality and where students develop [2]. Unquestionably, technological improvement will keep continuing faster [3], proof of that is the

invention and technological boom of the virtual assistants that work with virtual intelligence. There are many developers which have caused the use of these assistants and the significant expansion worldwide [4].

Thousands of users, between them, students, are familiarized with the usage of different applications, platforms, and technological educative devices since virtual assistant's availability goes from the ones that are incorporated to mobile devices such as SIRI, which is incorporated to Apple's devices, Google Assistant in mobile devices, Cortana, incorporated to computers and recently, intelligent speakers such as Google Home, Google home mini, and the Amazon's Echo dot which counts with Alexa, and many more others.

In that sense, it is proposed a theoretical revision of the principal technological developers that has been created to improve educative processes at different levels, as following. This work contributes significantly to professors to count with a range of possibilities about technological resources that might be used in their daily practice.

2 Virtual Assistants Contributing to Education

A virtual assistant is an intelligent agent, capable of perceiving its environment, processing those perceptions and answering or acting in its environment rationally [5], a software-based on artificial intelligence (AI) that could realize tasks or offering services to a user, being capable of realizing some actions common to humans, taking into account two characteristics: reasoning and behavior [6], this assistant could be set and adapted to users' needs, even being used as an educational tool in a class since these allow a constant interaction user-assistant.

This interaction catches children, teenagers, and adults' attention, since there is the possibility to talk to a virtual assistant, obtaining an answer which generates users' surprise and curiosity [7], producing an inner motivation, this fact could be useful to improve the learning experience, being a novel and advanced way that integrates ICTs into the education field. As it is affirmed by Escorc a and Trivi o [8], an advanced integration is evidenced in management strategies for ICT usage, as well as designing learning environments or designing projects which imply technological use. Figure 1 shows how the interaction with the assistants generates emotional responses from users.

2.1 Virtual Assistants in Mobile Devices and Computers

Siri

One of the pioneers of virtual assistants is SIRI, which has been created in 2007 [9]. Apple describes it as artificial intelligence with functions of a personal assistant, it is present in devices iOS, macOS, tvOS, and watchOS, within its functions are answering questions, making recommendations using natural language processing (NLP), contrasting information, makes calculations, becoming a type of mobile encyclopedia, which may be used as another learning tool in the teaching-learning process.

Cortana

This assistant was developed by Microsoft, appeared in 2014, at the beginning it was designed for Windows 10. Between its functions are natural voice recognition without



Fig. 1. Interaction with an intelligent speaker

the need to use the keyboard and answering questions using the information from the searching motor Bing [10]. Figure 2 shows a representation of the Cortana virtual assistant.

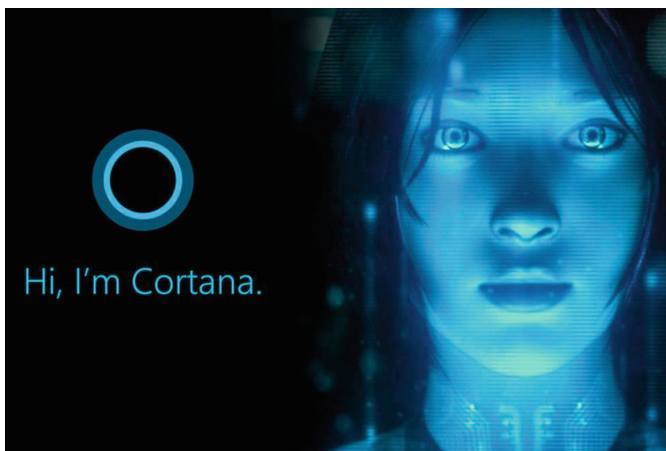


Fig. 2. Cortana's representation

Google Assistant

This is a virtual assistant developed with artificial intelligence by Google, it is present in domestic and mobile intelligent devices [11], appeared in 2016 and it is possible to interact with it through voice, admitting the input to the keyboard and its principal

educative uses are voice commanders or fast answering to any topic, students interact as a game with basic knowledge in a range of areas [12] (see Fig. 3).

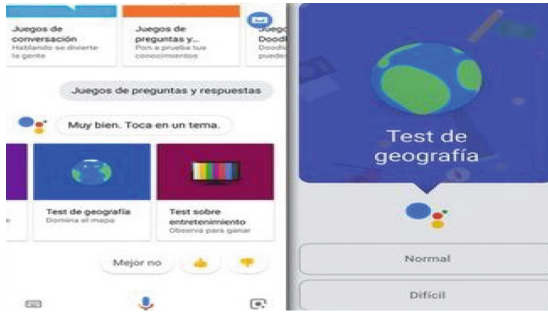


Fig. 3. Educational interaction with Google assistant.

2.2 Virtual Assistants in Intelligent Speakers

The evolution of virtual assistants drew strength when intelligent speakers Siri and Cortana were launched, as well as its mobile devices and computers' version. On the other hand, Google's assistant counts with an intelligent speaker denominated Google home. Samsung counts with its intelligent speaker Bixby, and Amazon counts with the Echo dot, which is integrated with Alexa's assistant and will be detailed in the next paragraph. Figure 4 shows intelligent speakers from each developer already explained.



Fig. 4. Intelligent speaker

Alexa

Alexa was launched in 2014, it is a virtual assistant developed by Amazon, using the intelligent speaker named Echo dot, within its educative functions are answering questions, contrasting and looking for information of any topic, translating to a variety of languages, solving math exercises, makes conversions, calculations, looks up for synonyms, reads fairy-tales, etc.

Also, when it is synchronized to a mobile device, it offers the opportunity to incorporate different abilities, these are nominated by Amazon as «Skills», is equivalent to the applications that are known in mobile devices. With these abilities inserted, Alexa becomes more intelligent allowing users to realize more functions just by telling Alexa what to do. It uses a set of tools, creating natural experiences by voice [13]. Nowadays, there are a variety of skills designed with educative goals, which would be used in the teaching-learning process or even in the autonomous students' learning.

2.3 Usage of Virtual Assistants Contributing to Education Field

Even when the usage field of the assistants in learning environments are not studied deeply, it is possible to point out some options, from which we will mention as following.

Virtual assistants could work as virtual professors, since they could keep an interactive conversation with the user, as it happens in the scholar environment, acting as an interactive professor or guide capable of solving questions, explaining some matters and also realizing automatic and personalized evaluations for each student [14].

Another option is the possibility of enhancing the learning of a second language since Alexa translates words and uses Skills to teaching languages and using answering corrections allowing to verify them and improving into the wanted expression [6]. In this sense, it offers the students the opportunity to acknowledge their mistakes, learning from them and being evaluated from their hits.

3 Psychological Benefits from Virtual Assistants in Learning Processes

Inner motivation is one of the benefits of using virtual assistants in the teaching-learning process, as it was previously analyzed, the usage of virtual assistants results novel and innovating for students, that is why learning became pleasant and improve results. According to Anaya and Anaya [15] when executing a task and there is joy, exists an inner positive motivation, since positive emotions influence inner motivation, thus, students' significant learning is possible.

4 Conclusions

Technological innovation is necessary to the present era education, reducing the gap between education and reality results imperative nowadays, that is why this study presents a closer look to the virtual assistants developed by different technological businesses, analyzing its characteristics and possible usefulness in the educative field.

As a contribution to education, it is proposed from the technology area to implement virtual assistants in the teaching-learning process and being able to evaluate the impact on students' academic achievements.

As for delimitations of this study, it is important to address the accessibility to the different devices and the internet connection that the schools count with, depending on

their location, as well as the risk of not being well-used with an educative objective within a set already planned and being converted on distractors agents, instead of educative, so, it is important to consider the curricula planning integrated to virtual assistants to improve learning processes.

It has been affirmed that studying the application of virtual assistants and its usage in the educative field is scarce, that is why this investigation took place, opening a new research line for the future in this area. Also, it is of great interest to the research team to corroborate the effects of the usage of these technological resources with experimental studies.

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