A platform for the stimulation of holistic learning in the teaching of Odontology.

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Abstract—**Information and communication technologies (ICTs) are changing the way people develop their lives. This change is not indifferent to activities involved in education. For this reason, several learning techniques, based on ICTs, appear to improve the efficiency of the educational process. However, the problem of a maintained individualized learning arises, which does not focus on needs of the student, since it only tries to transmit knowledge. From the point of view of Odontology, students have specific requirements, which allow them to emulate real situations as part of their university training. Therefore, it is necessary that different learning techniques are integrated into a single educational model, known as holistic education. This paper proposes a holistic learning platform, known as DentaLAV, focused on improving the study experiences of university odontology students.**

I. Introduction

Information and communication technologies (ICTs), in the last decades, experienced a gigantic development that gave way to what is known as a knowledge society. There is no human field that is not influenced by this development: health, economics, politics, education, and culture. This society is characterized by transforming the information obtained through Internet access in useful knowledge, which translates into benefits for humanity.

Knowledge multiplies faster than ever and is distributed instantaneously to any part of the world without time-space restrictions, breaking geographical barriers [1]. This generates the need to change educational models, adjusting to an economic scenario driven by knowledge. For this reason, all fields of everyday life are implementing new learning techniques: self-directed learning [2], peer learning [3], peer tutoring [4], collaborative learning [5] and sporadic network learning [6], based en ICTs.

Odontology is a discipline that makes the difference between other fields of study, since it has the particular characteristic of a process of simultaneous learning and application. Here, the student develops the necessary skills to obtain and interpret information from various dental study cases to be able to allocate adequate treatments [7]. This factor is a significant exponent for the implementation of ICT-based dental learning platforms, since official resources related to the subject such as readings, images, videos and animations would be easily accessible for students. There are several platforms for dental e-learning:

This paper is structured as follows. In Section II, the main learning techniques based on ICTs are described, which are implemented in DentaLAV. In Section III, the architecture that allows its correct operation is exposed. In Section IV, its form of operation and the implementation of a study case are detailed. Finally, the conclusions and future work are found in Section V.

II. ICTs-based learning

Due to the characteristics of information and communication technologies (ICTs), a series of learning techniques were developed that take into account the way in which each student likes to learn. Its purpose is to make the most of available resources, so that knowledge can be improved. The following subsections describe some of the most widely used ICT-based learning techniques.

A. Self-directed learning

The student should be the one who self-analyzes and learns by his/her own means. The teacher acts only as a guideline, to guide him/her when he requires it [8]. Thus, self-directed learning is a method of teaching that proposes to each student to take the initiative in the diagnosis of their learning needs, the formulation of objectives, the choice and search of human and material resources, the selection of strategies to improve knowledge and the mechanisms to evaluate their results [2], [9].

B. Peer learning

Peer learning can be defined as the acquisition of knowledge and skill through active helping and supporting among status equals or matched individuals. It involves people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by doing so [4]. In others words, is a *two-way reciprocal learning activity* in which there is mutual benefit to the parties involved [3].