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Medical Semiology Teaching Based on Intelligent eLearning

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Abstract. The paper proposes a methodology that emphasis techno-pedagogy, namely the constructivist and the adaptive intelligent learning of specialized semiology of COVID-19. An e-learning built on a constructivist pedagogy with a technology such adaptive intelligent environment, can be individualized (adaptive learning), can enhance learners' interactions with others (collaborative learning), and transforming the role of the teacher as facilitators of learning and assessor of competency. To make our system intelligent, we cope with Artificial Intelligence and Big data.

Keywords. Medical Semiology, Intelligent eLearning, COVID-19

1. Introduction

Since the advent of the COVID-19 pandemic, teaching is accompanied by technology which makes techno-pedagogy. There is a triangular relationship between teacher, machine and learner. From our point of view, constructivist learning and intelligent adaptive education are among the essential elements that allow to face the challenges posed by distance learning. The paper proposes an e-learning solution based on a constructivist and adaptive intelligent learning system of specialized semiology of COVID-19.

2. Methods

In accordance with WHO, primary care plays a significant role in gatekeeping and clinical responses: identifying and triaging possible COVID-19 cases, making an early diagnosis, helping vulnerable people cope with their anxiety about the virus, and reducing the demand for hospital services [1]. Semiology helps to build knowledge from the interpretation of subjective and objective data found on patient. Constructivist and adaptive intelligent learning can improve medical semiology teaching and the e-learning facilitates the acquisition of knowledge and skills [2]. An e-learning built on a constructivist pedagogy [3, 4] and in a technology such adaptive intelligent environment [5], can be individualized (adaptive learning), can enhance learners' interactions with

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others (collaborative learning), and transforming the role of the teacher as facilitators of learning and assessor of competency.

3. Results, Discussion and Conclusion

We present, in table 1, a methodology that emphasis the techno-pedagogy to support the development of an online medical education system. This is the first stage of our project.

Table 1. Constructivist and adaptive intelligent learning system.

Pedagogy	Techniques
Classroom: - Learner (Autonomous/Supported/Collaborative) - Teacher (Directed/Facilitated)	**Virtual Class**: Collaborative & Individual workspaces; Social interaction
Class description: Learning activities, tools, resources and materials	**E-valve & dashboard**
Content of knowledge/course: Pathophysiology, Clinical presentation, Pharmacotherapy, Case Repository & Ontology of COVID-19	**Electronic format**: texts, tables, graphics, images, sounds and videos.
Learner in learning: - Assimilation of knowledge; Consolidation of knowledge & Knowledge translation - Construction of knowledge and competencies based on ontology (pathway)	**Adaptive Intelligent learning environment:** Knowledge repository; profiling & intelligent tutoring + **Tools:** Organizers, Calendar and Contacts, Email, Videoconference & Instant Messaging
Evaluation: Problem-solving (individual & collaborative) based on interview; Physical Exam; Medical reasoning; Relevance of Additional & Presentation of case Exams	**E-assessment:** Individual interview, Report writing, Multiple choice question & Simulator of Clinical Cases + **Tools:** Evaluation-platform**,** Email & Videoconference
Teacher in mentoring: - Identification of the learner profile, adaptation of training according to performance, progressive profile refinement, recurring assessments & status of skills acquired - Analyze data coming from Analyzer & provide feedback directly or through the intelligent tutoring	**Analyzer:** based on profiler and e-assessment results + **Tools:** Organizers, Calendar and Contacts, Email, Videoconference & Instant Messaging

The scope of our study is to emphasis the techno-pedagogy, namely the constructivism and adaptive intelligent learning in medical education for medical students and health professionals seeking to strengthen their knowledge. We consider as stated in [6] that learning activities' role is a cornerstone to ensure the learners' learning process. The ontology plays also a major role in this process. In the other side, the teacher keeps the evolution of the learner on the dashboard based on information provided by the analyzer. To make our system intelligent, we cope with Artificial Intelligence and Big data.

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