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Blended Learning in Anatomy Teaching for Non-medical Students: An Innovative Approach to the Health Professions Education

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Received 15 March 2017; received in revised form 2 November 2017; accepted 2 November 2017

Abstract

Purpose: Anatomy is fundamentally an essential curriculum in health professions education. There are various commercial platforms providing learning materials in anatomy; the contents covered in great details are, however, not specifically designed for students majoring in non-medical programmes, such as nursing and pharmacy. To support Anatomy education, this study explored the feasibility of applying blended learning approach composed of narrative animation, interactive revision guide, and gamified quiz in the development of a courseware called electronic Professional Study (ePS).

Method: The Cardiovascular system was selected as the pilot theme as it is one of the most commonly diagnosed disorders in the local population. Under the central theme, three micro-modules were developed, including Heart Structure Investigation, Coronary Circulation, and Histology of Blood Vessels. This paper in two parts describes the development and components of the ePS courseware and presents preliminary findings of the evaluation conducted among courseware users.

Results: ePS was successfully launched in the university-wide learning platform, *Blackboard Learn*, where access is available to Pharmacy students attending the Anatomy course. Student's opinion about the courseware was surveyed at the end of the term. Study findings reported that blended learning with gamify components could function as positive reinforcement encouraging self-learning.

Conclusions: This study shows that the gamification design elements included in ePS are advocated to address students' needs in Anatomy learning and could be applied in other science-related learning and teaching in the Faculty of Medicine.

Keywords: Micro-module; Anatomy; Health Profession Curriculum; Medical education; e-learning Courseware; Gamification; Hong Kong

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Peer review under responsibility of AMEEMR: the Association for Medical Education in the Eastern Mediterranean Region

https://doi.org/10.1016/j.hpe.2017.11.001

Please cite this article as: Ngan OMY, et al. Blended Learning in Anatomy Teaching for Non-medical Students: An Innovative Approach to the Health Professions Education. *Health Professions Education* (2017), https://doi.org/10.1016/j.hpe.2017.11.001

1. Introduction

Anatomy is a fundamental curriculum in health professions education, including medicine and medical health professions (i.e., nursing and pharmacy), which require students to acquire an understanding of the structure and function of human body systems during freshman and sophomore. Cadaver dissection, a major activity in the process of learning anatomy and its benefits, have been widely reported.[1] For example, students can gain an accurate perspective of the size and location of an organ, understanding the context of surrounding organs and tissue of which that could not be taught by viewing one organ in a textbook.[2] Despite its advantage, cadaver dissection is not a mandatory curriculum for medical professionals who are expected to understand the gross structures and functions of various human body systems.[3] In the explosive digital information growth, the adoption of electronic learning (e-learning) materials with the didactic lecture are now increasingly popular in the university teaching practices, especially for health professions education.[4–6] There are various commercial platforms providing learning materials in anatomy and the contents cover in great details things that are not specifically designed for non-medical students (i.e. nursing and pharmacy).[7]

1.1. Blended learning in medical education

Blended learning, a type of modern teaching, integrates didactic teaching pedagogy with media-rich technology, where students can gain access to an additional learning medium in supplementary to the formal classroom teaching, tutorials or practicals.[8–10] One distinctive advantage of integrating e-learning elements in teaching is that it provides a prior exposure of materials before in-person lectures. It has been suggested that using e-learning materials prior to lectures can help facilitate critical thinking and engage discussion between students and teachers during the class.[11,12]

1.2. Gamification in health professional education

The concept of gamification, which advocates 'the use of game design elements in non-game contexts,' has been widely adopted in health profession education to facilitate knowledge acquisition, self-reflection study, and skill practising in training.[13,14] Evidence suggests that the gamified pedagogy motivates students to learn in the way of problem-solving[15] and expedites learning outcomes.[16] In the competitive of the health-related field, gamification shall incorporate complex intervention including setting up questions at varying levels of difficulty and leaderboards to increase the competition among the peers.[15]

1.3. Integrating blended learning in anatomy and histology teaching: ePS courseware

To explore the feasibility of applying blended learning approach with gamification elements in anatomy teaching and learning, an e-learning platform called electronic Professional Study (ePS) was developed. In particular, we selected a topic of the cardiovascular system as a pilot module because it is related to the world's most common non-communicable diseases, cardiovascular diseases, including diseases of the heart and blood vessels. Worldwide, about 17.5 million people die each year, which accounts for an estimated 31% of all deaths, the world's top cause of fatalities.[17] In respect to its high incidence and clinical importance, the topic of the cardiovascular diseases is chosen for this study.

The best opportunities for scientific progress lies in understanding the detailed mechanisms of cardiovascular diseases at the cell and tissue level and applying this understanding to develop new prevention and intervention strategies.[18] In conventional teaching in histology, virtual microscopy was adopted to teach tissue sections using one or more microscope objectives at one or more focal planes. Students nonetheless found it difficult to grasp the understanding as certain tissues appear quite similar, making it difficult for a student to differentiate between them.[19] There is another freely available platform called HistoViewer, which provides a central database for cytology and histology courses.[20] The pictures do not include labelling, so the students at the beginning learning level do not benefit from the extensive database.

This paper in two parts describes the development and components of the ePS courseware and presents preliminary findings of the evaluation conducted among courseware users.

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