Assessment of a novel computer aided learning tool in neuroanatomy education

Javaid, Muhammad Asim

Date: 2018

Copyright: © 2018, Muhammad Asim Javaid.

Copyright information: http://creativecommons.org/licenses/by-nc-nd/3.0/

Full text restriction information: Restricted to everyone for one year

Restriction lift date: 2020-08-20


Supervisor(s): Toulouse, André; Cryan, John F.; Schellekens, Harriët

Abstract:
Impaired understanding of intricate neuroanatomical concepts and structural inter-relationships has been associated with a fear of managing neurology patients, called neurophobia, among medical trainees. As technology advances, the role of e-learning pedagogies becomes more important to supplement the traditional dissection / prosection and lecture-based pedagogies for teaching neuroanatomy to undergraduate students. However, despite the availability of a myriad of e-learning resources, the neuro-anatomy phobia – neurophobia nexus prevails. The focus of the PhD was to investigate the difficulties associated with learning neuroanatomy and to develop and assess the efficacy of a novel e-learning tool for teaching neuroanatomy, in the context of the strengths and pitfalls of the currently available e-learning resources. Firstly, we sought to provide direct evidence of the medical and health science students’ perception regarding specific challenges associated with learning neuroanatomy. The initial results showed that neuroanatomy is perceived as a more difficult subject compared to other anatomy topics, with spinal pathways being the most challenging to learn. Participants believed that computer assisted learning and online resources could enhance neuroanatomy understanding and decrease their neurophobia. Next, in the context of the significance of e-learning for supplementing traditional pedagogies, we identified features of neuroanatomy web-resources that were valued by students and educators with regards to learning neuroanatomy of the spinal pathways. Participants identified strengths and weaknesses of existing neuroanatomy web-resources and ranked one resource above the others in terms of information delivery and integration of clinical, physiological and medical imaging correlates. This provides a novel user perspective on the influence of specific elements of neuroanatomy web-resources to improve instructional design and enhance learner performance. Finally, taking into consideration the data acquired from students and educators, a novel, interactive, neuroanatomy learning e-resource was developed to support teaching of the neuroanatomy of the spinal pathways. The instructional design included a discussion of the clinical interpretation of basic neuroanatomical facts to aid in neurological localization. The e-learning tool was assessed and evaluated by undergraduate medical and neuroscience students using neuroanatomy knowledge quizzes and Likert-scale perception questionnaires and compared to the previously identified best-ranked neuroanatomy e-resource. Participants’ opinion regarding the usefulness of various components of the tools was also gauged. The results showed that usage of the UCC e-resource led to a significant increase in participants’ knowledge of the neuroanatomy of the spinal pathways compared to students’ who did not use e-resources. Moreover, the participants reported a greater interest in learning neuroanatomy with the novel tool, showing a greater appreciation for it while learning clinical neurological correlates compared to those using the best available e-resource identified earlier. In summary, the prevailing problem of neurophobia could be addressed by enhancing student-interest.

Technological e-learning pedagogies, with intelligently designed interactive user-interface and clinical correlation of basic neuroanatomical facts can play a pivotal role in helping students learn neuroanatomy and breaking the nexus between neuro-anatomy phobia and neurophobia.

Show full item record

This item appears in the following Collection(s)

- College of Arts, Celtic Studies and Social Sciences - Doctoral Theses [418]
- College of Medicine and Health - Doctoral Theses [288]
- ASSERT - Doctoral Theses [1]
- Doctoral Theses [1613]
- Medicine - Doctoral Theses [69]
- Anatomy and Neuroscience - Doctoral Theses [35]
- Education - Doctoral Theses [43]

Except where otherwise noted, this item's license is described as © 2018, Muhammad Asim Javaid.
Computer-aided learning (CAL) is an integral part of many medical courses. The neuroscience course at Oxford University for medical students includes CAL course of neuroanatomy. CAL is particularly suited to this since neuroanatomy requires much detailed three-dimensional visualization, which can be presented on screen. The CAL course was evaluated using the concept of approach to learning. The aims of university teaching are congruent with the deep approach-seeking meaning and relating new information to previous knowledge-rather than to the surface approach of concentrating on rote learning. Computer-aided learning for the education of patients and family practice professionals in the personal care of diabetes. Diabetes Mellitus is approaching pandemic proportions across the globe. It is a disproportionately expensive condition, accounting for 5-9% of annual NHS expenditure. Process planning is an important stage in the creation of a new product. A design prototype may be seen to function perfectly, but it remains necessary to design the volume manufacturing process itself.