Open online surgical education - the experience with hand surgery

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Introduction

Digital education is changing the landscape of higher education and has the potential to improve education opportunities for surgical trainees as they try to balance the demands of career, work-life and surgical education. The aim of this project was to address these challenges with an online work-based learning framework that offers self-paced, self-directed and on-demand learning. The authors conceptualised, developed and deployed an open online hand surgical learning program on the Moodle platform (learning management system).

Problem

- Hand and wrist injuries annually account for US$740 million and rank first in the order of most expensive injury types in the Netherlands. They account for 1.1 million emergency room cases/year US and 270,000 hand referral/year UK.
- Education and training are vital for quality care/ optimum outcomes of these patients. Current undergraduate curricula are inadequate and do not allow for teaching hand surgery. Postgraduate hand surgery programs are exclusive and are included as part of orthopaedic or plastic surgery programs.

Current Theory

The Massive Open Online Course (MOOC) is the product of the newer theories of networked learning and connectivism. It targets a large audience with large scale interactive participation and open access (free access) via the web. It provide interactive user forums that help build a community for the students and teachers. (“Massive open online course” 2013). Learning activities can be synchronous or asynchronous, and are usually designed with a flexible structure allowing for self-paced on demand learning. These online courses are universally accessible thereby enabling extensive collaborative and interactive opportunities for students. The main disadvantage is that they have low teacher interactivity and feedback and this will not be acceptable for some students, who expect or thrive on a high level of teacher interaction. This phenomenon has revolutionised the relationship between learner and instructor and between schools and the wider community (Thompson, K November 2011).

The basic design of MOOC requires instructional design that facilitates large-scale feedback and interaction. It includes (“Massive open online course” 2013): - Crowd sourced interaction and feedback by leveraging the MOOC network, e.g. for peer-review, group collaboration - Automated feedback through objective, online assessments, e.g. quizzes and exams. - The principles of connectivist pedagogy of MOOC include (“Massive open online course” 2013): - Aggregation - it allows for a massive amount of content to be produced anywhere online, which is later aggregated as content page to participants on a regular basis. - Remixing - associating materials created within the course with each other and with materials elsewhere. - Re-purposing of aggregated and remixed materials to suit the goals of each participant. - Feeding forward and sharing of re-purposed ideas and content with other participants and the world.

Solution

The current need is for a program that is:-
- flexible
- Student-centred
- allows for on-demand learning
- universally accessible
- affordable
- locally relevant

With this back round the authors developed the Moodle website, open online learning platform, www.handsurgeryedu.com

Results

An online modular program was created with three levels of qualifications: 1) PG Certificate 2) Diploma 3) Master’s degree

It was deployed on a MOODLE LMS (handsurgeryedu.com) with an international faculty. It was deployed on a MOODLE LMS (http://www.handsurgeryedu.com) with an international faculty. The Massive Open Online Course (MOOC) was used to determine the content of the curriculum. A survey of stake holders in hand surgery was also used to augment the curriculum design. An open online platform was chosen to deploy the curriculum founded on the work based learning framework. The learning management system allowed for various resource material which included content produced by the authors and other digital assets produced by various teachers internationally with permission. Registration was required to participate but no fee was imposed.

Assessment was provided by automated online tools, together with real-life based reflective assignments to ensure high order learning had taken place. The faculty of international hand surgeons was recruited using the authors’ network, to assist with the reflective assignments for those learners who chose to be assessed.

Currently the program is being accredited by a University.

Effects

The platform is currently being utilised by the authors for teaching hand surgery in a blended approach and by learners from around the world to augment their knowledge.

Conclusion

From the feedback of participants of the blended learning programs, we found this platform augmented post-graduate and undergraduate medical education and can be used to enhance the learning experience of students. It allows for better utilisation of face to face synchronous teaching. It also allows for universal access to media rich digital assets.

Some excerpts from the platform

Sample of online resources

Results of an automated online test

Sample of a written assignment

Bibliography


The curriculum for the program was designed on a community oriented and outcome based framework. Data from a tertiary referral centre in Birmingham was used to determine the content of the curriculum. A survey of stake holders in hand surgery was also used to augment the curriculum design. An open online platform was chosen to deploy the curriculum founded on the work based learning framework. The learning management system allowed for various resource material which included content produced by the authors and other digital assets produced by various teachers internationally with permission. Registration was required to participate but no fee was imposed.

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Table of international referrals

<table>
<thead>
<tr>
<th>Country</th>
<th>Last Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>12 secs</td>
</tr>
<tr>
<td>Burkina Faso</td>
<td>4 hours 41 minutes</td>
</tr>
<tr>
<td>Seychelles</td>
<td>8 days 20 hours</td>
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<tr>
<td>Ireland</td>
<td>10 days 2 hours</td>
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<tr>
<td>United States</td>
<td>12 days 13 hours</td>
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<td>Bangladesh</td>
<td>34 days 19 hours</td>
</tr>
<tr>
<td>Croatia</td>
<td>47 days 16 hours</td>
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