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Descriptive Account

Physio-Learn – developing a modern device responsive social multimedia teaching tool for physiotherapy students

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The use of eLearning material in medical education and its effectiveness has been well documented (Bloomfield et al., 2013; Ruiz et al.; 2006) including the use of online video training (Holland et al. 2013; Berk, 2009) and also the experimental use of social media and its teaching applications in Higher Education (Mateer et al.; 2014; Cheal et al.2012). Physio-Learn was designed in collaboration with a physiotherapy team from the School of Health Sciences and The Office for Digital Learning (ADDL). It was developed to help physiotherapy students visualise how a real patient with respiratory disease might present, in order to help prepare students for clinical practice.

The impact of respiratory disease

In 2006, deaths from respiratory disease accounted for almost 14% of all deaths in Northern Ireland (Service framework for respiratory health and wellbeing, 2012). Shortness of breath (breathlessness) is one of the most burdensome symptoms reported by patients with Chronic Obstructive Pulmonary Disease (COPD) (Joshi et al., 2012). High numbers of patients with respiratory disease are admitted to hospital with an infection every year, which in turn has a major impact on health services, both locally and nationally.

Physiotherapy can help patients with respiratory diseases to manage a range of problems such as breathlessness, sputum retention, poor cough, low oxygen levels and general deconditioning and reduced mobility and function (Bott et al., 2009).

Current respiratory teaching of Physiotherapy at Ulster University

Year 1 BSc Hons Physiotherapy students are typically males and females between 18-23 years. Current teaching on the respiratory component

of the course includes lectures, practice of skills and face-to-face demonstrations with class role-play where staff demonstrate and students practise a range of techniques on each other. This teaching format for the topic of breathlessness was discussed with a small focus group of physiotherapy students (n=11) who had just completed the module as well as their first clinical placement in respiratory health. Overall, the existing online content supporting the topic of breathlessness within the course Virtual Learning Environment (VLE) had been described in the focus group as “Text heavy” and “Not engaging enough”. Students had indicated that it was very difficult for them to visualise how a real patient with respiratory disease might present, or to gauge the impact of the respiratory disease on the patient. It was also hard for students to envisage which physiotherapy treatments might help patients to manage symptoms such as breathlessness.

Most physiotherapy students will not encounter a real patient with breathlessness until their first work placements within a hospital setting at the end of their first year. Specifically for the topic of breathlessness, students suggested that:

- A real example of a breathless patient would help their learning and understanding, and videos illustrating treatment techniques would be really helpful;
- Embedding theory and pathophysiology using a visual format would be helpful for understanding the assessment and management of the breathless patient;
- A resource that could be accessed on a range of devices outside of the teaching slot on the timetable would be helpful, and it could also be used both for revision during term time and as much needed reference while on placement within a hospital setting.

The teaching team considered these suggestions and they informed the decision to consider a collaborative multimedia solution with the Office for Digital Learning (ADDL) within Ulster University to support teaching on the topic of management of the breathless patient. Recent data related to social networking has shown that, as of January 2014, 74% of online

adults use social networking sites, with highest users in the 18 – 29 age group (Pew Research Center, 2014). In 2013 there were 12 million United Kingdom (UK) Twitter users. Statistics for the distribution of Twitter users in the UK in 2014 by age group show that the age range 18 – 24 accounted for 24.5%, and the age range 25 – 34 for 25.4%. Both groups together account for half of all UK based twitter use (Statista, 2015)

As typical students for this subject area are Year 1 BSc Hons Physiotherapy students (age range usually 18-23yrs), it was decided that a social network learning aspect would be added, making use of existing age group social networking skills. It has been reported that the use of Twitter in educational content can increase student engagement and help to improve grades (Junco et al., 2010).

Proposed solution: Physio-Learn (Learning. Engaging. Accessing. Responding. Networking)

This solution has been designed as a modern responsive social multimedia teaching and learning tool which puts the learner, the patient and the teacher all at the heart of its design. The content is specific to the topic of “Management of patient breathlessness”.

The Interface

This was developed using HTML5 for maximum flexibility to run on a number of modern systems using a modern HTML5 enabled Web browser. The Physio-Learn teaching tool can work across a wide range of screens and devices, including desktop/laptop computers and a range of tablet and mobile devices. It can also be plugged into a VLE to report quiz scores to grade books, and function as a standalone subject, or as one of a number of future themed subject individual learning packs. If developed further, it could be marketed as a teaching product to other universities and hospitals both in the UK and internationally in the area of physiotherapy or, indeed, other teaching related topics.

Simplifying the user experience

When the student logs on to Physio-Learn they view a very simple and clean interface, with clear instructions on what to do. There are only three main sections:

- Home: This directs the students to a long scrolling visually engaging page covering a number of facts and interesting background information on the topic of breathlessness. This ends with a real patient talking about the impact of COPD on their life. This page is designed to have an emotional concept, putting a real person's face and impact statement on the subject that is being studied;
- How To? Students are then directed to go to the "How to?" section of the course. This explains the basics of how to use all of the social media elements of the course – such as Twitter, Pinterest and Vimeo;
- Knowledge Area: This contains the actual teaching content, which has been divided into 3 main sections: A, B and C. The student initially must take each section in order. An assessment quiz at the end of each section will then evaluate students' knowledge, and advise them to proceed or to retake that section again depending on their score. When they have unlocked all sections (A, B and C) they are given access to all the teaching content as a book-markable page for easy access for on-going review and revision.

Teaching Content

After expected learning outcomes are presented, the teaching content is video focused with little text usage, using a simple clean interface. These professional videos contain assessment of a real patient and there is engaging 3D content, graphic overlays and narration to maximise student learning and video value. Students have full control of the video display, and they can also alter the screen to full size on their computer or mobile device.

All video is high definition (HD) so it projects with high quality on even the largest or smallest of screens. The video and Physio-Learn interface adapts to the way it is being held, either portrait or landscape, for maximum usability. The top and bottom sections of the interface are pinned in place. This allows the key interface controls (and also Twitter, Pinterest, Mail icons) to stay always in easy reach regardless of the size of screen used or direction of screen.

Social Learning Content

At any time during the course a student can make comments on the Physio-Learn private Twitter site, or be directed to find and post content to the Physio-Learn Pinterest site. At the end of each knowledge section, students are invited to click on the Twitter link, where they are expected to exchange views and/or content about the topic of breathlessness for the section they have just completed. They could also be set an assignment such as finding and contributing topic-related content to the Physio-Learn Pinterest board.

Physio-Learn has the capacity to stage key social teaching events, for example an invited guest, international physiotherapist or VIP health scientist Tweeter can tweet live to the class on current research or new emerging techniques, followed by a tweet and answer session. These live debates or commentaries on topics via Twitter will help maintain interest, keep knowledge current and help students to continue to develop their skills and clinical reasoning on this subject.

With the use of a Pinterest Board students create a legacy item that will be viewed by the next cohort of students to take the class. In this way the students are not only learning from existing content provided; they are, indeed, contributing and growing the content in the course. Teaching staff, having full administration rights, can filter the best content, making it even more valuable to the next course.

The video clips have a social element. If the student has a basic Vimeo account they can “Like” or “Comment” on the video. For teaching staff, this allows them to access and collect a wide range of useful user data and graphs via their Vimeo statistics page. It is hoped that patterns of best practice will emerge, influencing future video development for the site to make it an even more student focused learning object.

Physio-Learn Prototype - Student Evaluation

The first cohort of BSc Hons Physiotherapy students had brief access to Physio-Learn towards the end of their year 1 Cardiorespiratory module (May, 2014). A random sample from the class (17/56 students) were

invited to provide views about Physio-Learn on the topic of breathlessness using a questionnaire. The questionnaire contained five questions, which used a Visual Analogue Score (VAS) scored from 0 (not useful) to 10 (very useful) and two open questions to explore strengths and weaknesses of Physio-Learn. The results are presented in Table 1.

Strengths and Limitations

Physio-Learn received very positive feedback from students (Table 1). The key strengths of this project included the use of a real patient with COPD and the ease of use and ability to access the material on a range of mobile devices, including tablets and phones (Table 1). One limitation, which the team plan to address when further developing Physio-Learn, is to include more topics other than breathlessness, as this was the suggestion most frequently requested by students (Table 1).

The ability to reuse this teaching template adapted to a range of modules within Physiotherapy or indeed a wide range of other HE teaching subjects and the potential commercialisation to hospital staff training subjects is high. However, this is subject to a fuller investigation on both longer term student feedback and impact on student learning and retention evaluation study.

Conclusion

This project resulted in the development of “Physio-Learn,” a responsive social multimedia teaching template on the topic of “Management of patient breathlessness”. It has been enthusiastically received, with a strong desire from Physiotherapy students for more topics delivered through this creative medium.

Recently Higher Education organisations globally have shown much interest in the development of Moocs (massive open online course) and Spocs (small private online courses) (BBC, 2015). Similar to aspects of Physio-Learn, these make heavy use of high quality video teaching material and use social media tools to attract and hold student engagement and active involvement in their courses. With the increasing student demand for digital learning experiences that can start on

one device and can be continued on another without any noticeable degradation to the user experience, the future of eLearning will become an increasingly mobile (responsive) and less desktop (fixed) experience. Higher

Questions 1-5 used a Visual Analogue Score (VAS) scored out of 10 and results are presented as average scores and percentages (%).

1. Please indicate your overall impression of Physio-Learn: Management of breathlessness.
From 0 not helpful to 10 very helpful
Average = 8.5/10 (85%)
2. Overall, how useful is the current content of Physio-Learn for supporting your learning and understanding about the management of patient breathlessness?
From 0 not useful to 10 very useful
Average = 8/10 (80%)
3. Physio-Learn offers flexible access on computers, tablet devices, iPhones/ smart phones. Please indicate if you think this will be important for your future access to Physio-Learn.
From 0 not important to 10 very important
Average = 8.7/10 (87%)
4. What do you think of using Social Media to help you learn this subject?
From 0 not helpful to 10 very helpful
Average = 8.1/10 (81%)
5. Please indicate your views about whether we should add new topics to Physio-Learn.
From 0 not worthwhile to 10 very worthwhile
Average = 8.9/10 (89%)

Questions 6 and 7 were open questions and common themes have been summarised and presented.

6. One thing I particularly liked about Physio-Learn was:

- The layout and ease of access; you can access it most places you go
- The test questions and quizzes
- How easy it was to use
- Videos: helpful for learning; are easy to use when visualising content; and especially of our lecturers (familiar faces); engaging and a change from staring at a book
- Up to date and current. Interactive learning easier/more interesting than books
- **That I can use my smartphone and access information quickly on the move**

7. One thing I would have liked in Physio-Learn was:

- **More content**
- **More topics other than breathlessness;**
- **More examples of patients (different levels within illness)**
- **More videos demonstrating the use of equipment**
- **More variation of videos regarding symptoms/conditions**
- **Expand Physio-Learn and include info from the other modules; it's a great platform to inform people, possibly key issues/info about physio**
- **Facebook page**
- **If possible make sure you don't have to view all videos every time you log on**

Table 1. Summary of Physio-Learn (prototype) student evaluation

Higher education will increasingly be required to develop a range of agile and responsive online teaching solutions that offer both high production values and high social engagement.

Award winning: Physio-Learn was Runner-up in the RSCni eLearning Innovation Awards (2014) in Higher Education for Teaching and Learning. Project Video Demo: <http://player.vimeo.com/video/95489526>

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