Using “Big Data” to Guide Implementation of Osmosis, a Web and Mobile Adaptive Learning Platform for Medical Students

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Background: Adaptive learning platforms (ALPs) can revolutionize medical education by making learning more efficient: they can tailor learning to an individual’s needs and apply techniques proven through cognitive science research (e.g. testing effect, spaced repetition, interleaving). Unfortunately ALPs’ potential has not been realized because students do not use them persistently.

Summary of work: To explore why students use ALPs persistently, we applied educational data mining methods to USA medical student data collected through one ALP called Osmosis from August 1, 2014 to July 31, 2015. Multivariate logistic regressions modeled Osmosis persistence as the dependent variable and Osmosis-collected variables as predictors.

Summary of results: Of 6,787 students included in our analysis, 2,138 (31.5%) used Osmosis persistently. Number of formative assessment items per student, mobile device use, subscription payment, and group membership were independently associated with persisting (p<.001, all models). Adjusting for number of items, lower response accuracy was associated with persistent use (p<.01).

Discussion: These data from approximately 15-30% of all U.S. preclinical medical students offer insights into how ALP implementation can be improved. Future research should explore the intriguing finding that students with more wrong answers were more likely to persist; perhaps students prefer an ALP with content which challenges them.

Conclusion: This study is an illustration of big data medical education research, provides guidance for effectively implementing ALPs, and paves the way for future work which assesses individual and contextual factors which can further optimize ALP adoption and persistence.

Take-home message: Applying educational data mining methods to large existing datasets is feasible and yields meaningful results; such methods could be used more often in medical education research. To improve implementation of ALPs, institutions could ask students to share in their cost and form groups, and track usage to guide early intervention.
#353 (1987)
**Understanding students' experiences and personal learning strategies when using mobile technologies in the clinical workspace**

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**Background:** Medical students work and study in an increasingly digital clinical workplace (Kelsey, 2015). Integration of mobile learning is patchy yet has the potential to play a key role in medical education. We explored student experiences of using mobile technologies and devices to understand opportunities and constraints for more widespread adoption.

**Summary of work:** Twenty-eight third-year University of Bristol medical students participated in the study. Diaries and interviews captured the utility and acceptability of mobile learning technologies within the clinical workplace over a 10-month period. Inductive qualitative analysis of the data identified emerging themes and a set of codes for further data analysis.

**Summary of results:** Key themes identified included; immediacy and efficiency of access to information and learning resources, acceptability of mobile devices within the clinical workplace, new learning spaces and opportunities and collaboration between peers and teachers. Students developed a diverse range of studying skills, strategies and learning behaviours supported by their mobile devices.

**Discussion:** Mobile devices consolidated real-time teaching in clinical settings, provided flexibility of learning spaces and enabled students to personalise their learning. Perception of devices by patients and healthcare professionals varied with potential to hinder use. Students who adapted well, experienced changes in learning behaviour embedding mobile learning into their studying strategies.

**Conclusion:** Mobile technologies enhanced the learning experience for students who adopted devices as the mainstay in their studying in clinical settings; others preferentially used conventional methods. Medical educators and developers should do more to support and design curricula to maximise the use of digital and mobile technologies enabling personalised learning.

**Take-home message:** Providing medical students the opportunities early in their career to purposefully use mobile learning holds the potential for new cohorts of doctors to thrive in an increasingly digital healthcare service. Faculty should develop staff and student mobile learning practices and associated digital capabilities in support of this.

#354 (825)
**What do new entrants to the medical profession need to know? An analysis of social media submissions to #tipsfornewdocs**

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**Background:** Twitter, a microblogging social media site, is an increasingly popular platform for doctors to explore clinical and professional topics, with engagement from both professional and lay audiences. The #tipsfornewdocs hashtag is used to share advice with newly-qualified doctors. This study codifies the nature and focus of such advice.

**Summary of work:** An analysis of the Twitter activity containing the hashtag #tipsfornewdocs was performed using Symplyr healthcare analytics software. Tweets from a peak 48 hour period in 2016 (immediately preceding the first day of work for newly qualified UK doctors) were analysed using thematic analysis.

**Summary of results:** Between 01/08/2016 and 02/08/2016, 661 unique #tipsfornewdocs tweets were posted. 621 (93.9%) were posted from the UK and 522 (78.9%) were by doctors, with the remainder by allied healthcare professionals and patients. The focus and intent of these tweets were characterized in relation to professional development theories.

**Discussion:** The content of most #tipsfornewdocs tweets could be categorized into Eraut’s (1994) four aspects of professional knowledge, with many sharing tacit knowledge and facilitating improved personal knowledge. A significant subset of tweets attempted to support or accelerate socialization into the profession: an essential step in joining the healthcare community.

**Conclusion:** Advice given to new doctors using #tipsfornewdocs comprises both professional knowledge acquisition and professional socialization. Analysing hashtagged posts provides a relatively rapid way of understanding key issues in professional education, the perceived knowledge gaps of new doctors, and the ways in which socialization into the professional might be practically supported.

**Take-home message:** Social media informs and supports newly-qualified doctors. Despite their brief and often jocular nature, #tipsfornewdocs tweets provide meaningful and varied advice. Hashtag-driven enquiries are a valuable and time-efficient way of accessing and sharing tacitly held knowledge. Social media content analysis provides valuable insights into key educational issues and novel solutions.
Use of Facebook in medical education: experience as an informal tool in the internal medicine residency course

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Background: Social networking sites have become important communication and sharing information tools, educational strategies could be implemented. Access to Facebook is easy; individuals can get on-line 24 hours/day through their devices. Residents from the “Hospital General de México” Dr. Eduardo Liceaga (school-hospital) implemented this informal resource to improve their learning.

Summary of work: Implement Facebook to support rehumatology module in 2016 academic program. Showing a descriptive, observational and participative study. Facebook “Internal medicine group” included 87 internal medicine residents, clinical images and questions were selected from actualized medical literature and shared via Facebook; questions were made according difficulty, media tutorial support is given.

Summary of results: Volunteer participation was of 48%. Evidence of different kind of interactions were exposed: collaborative learning, learning interconnections, sharing academic resources, tutorial support and analysis of information. Approach to key points, were reached with the support of mayor grade residents. Pictures from the Facebook wall of the group expose these interactions.

Discussion: Via Facebook, important aspects of the pathologies are emphasized by the case-images, details are missed due short-time classes. That was roughly the importance of the tutorial support. Facebook is an important tool of implementation of media tutorial, as residents have free-access to web, straying off the traditional way of learning.

Conclusion: The use of social media, though informal, is an important pedagogical complement so far in this century. It diverts from the traditional class learning and here we expose the easiness to share quality information in medical matters and direct it to the specific objectives of a determined academic program.

Take-home message: Medical teachers should take in to account this modern tool, to get access to their students; given the facilities of sharing information and stay connected all time the students can express doubts and tutors can provide support through discussion or sharing information. More activities could be planted through networking sites.

Social media and medical education: a learner-centered framework

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Background: Social media blurs the divide between the public and private spheres. Though beneficial for learning and collaboration, it poses unique challenges for medical students entering a profession. Social media guidelines were developed at National University of Singapore to help students utilise social media responsibly and effectively.

Summary of work: The development of the social media guidelines took a learner-centred approach across two phases. First, a research assistant worked with a medical student to identify and code publicly available social media guidelines from universities worldwide before drafting our own. Then, focus groups were held with students to fine-tune the guidelines.

Summary of results: From the first phase, 40 documents were identified, 6 were coded, and 33 codes were identified. In the three focus group sessions consisting of 6 to 11 students each, student feedback was obtained in the following areas: content, tone, intention, and communication of the guidelines to the medical student body.

Discussion: As a direct result of student feedback, the guidelines were reworked to include both specific prohibitions and more general guidelines. Frameworks for action in specific situations were also refined based on what students felt was most realistic. Feedback on how best to communicate the guidelines was also taken into account.

Conclusion: Involvement of a student for the first phase of development helped to ensure that the guidelines broadly addressed crucial issues related to social media. The focus group discussions also added much value to the initial guidelines, and the final social media guidelines were significantly edited following student feedback.

Take-home message: The development of the social media guidelines with a learner-centred framework helped to bridge the disconnect in understanding of social media usage and trends between faculty and students. It also provided useful information on how best to frame the guidelines and communicate them to students with clarity and empathy.