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STUDENTS ATTITUDES TO TECHNOLOGY-ENHANCED LEARNING AND ITS USE IN MEDICAL EDUCATION

Lineen, C; Bennett, D
School of Medicine, University College Cork

Background:

Technology plays a huge role in every facet of modern society, with medicine, and education being no exception. In education, tutors and students are moving away from the traditional methods of lectures and textbooks, and are beginning to adopt and include more Technology-Enhanced Learning (or "TEL") into their curricula.
Multiple studies have shown that TEL is effective, convenient and preferred by students. Other studies have highlighted barriers to TEL, including low quality TEL and cost. Another important barrier is diversity in technological literacy amongst students.

The aim of this study was to examine students' baseline use and knowledge of Technology-Enhanced Learning.

Methods:

The study consisted of a cross-sectional study using an anonymous, qualitative paper-based survey of students at University College Cork (UCC) School of Medicine. Third year Direct Entry students and Second year Graduate Entry students were invited to take part.

Ethical approval was obtained from the Clinical Research Ethics Committee, Cork, on the 17th February 2015.

The survey considered four main areas: technological devices (laptops, computers, smart phones, tablets and e-readers), websites, programmes and social media outlets. Suggestions were offered for each, and students were asked for their individual frequencies of use (Never, Rarely, 2 – 3 times per week, 4 – 5 times per week, and Daily). Students were encouraged to volunteer any additional items not already mentioned in the survey. For electronic devices, ownership of each device was also asked. For social media sites, students were asked if they had an account on the site.

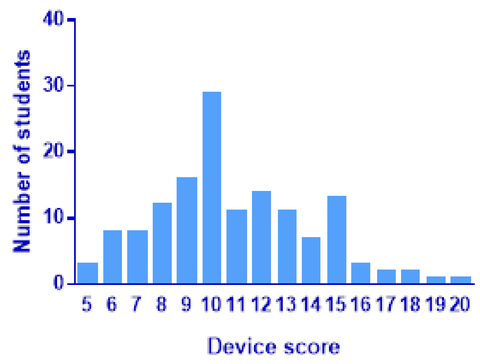
Once all surveys were collected, the data was entered manually into Microsoft Excel. A coding system was used for frequency, with "1" indicating never, "2" indicating rarely use, and so on up to "5" for daily use. For electronic devices and social media sites, "0" was used to indicate not owning the device/an account on the social media site.

This data was analysed using IBM SPSS Statistics (version 20).

Results:

Devices
96.4% of students owned both a laptop and a smartphone. No one owned neither. Laptops were more popularly used than smartphones ($p<0.001$).

A summary measure was calculated to give each student a score based on their usage of devices overall (taking frequency of usage into account). This was done by adding their scores for each device. The scores ranged from 5 to 20, the mean being 10. (A score of 5 is the equivalent of using at least one device per day).



Websites
The most commonly used websites for learning (taking frequency of use into account) are displayed here, alongside their Mean Rank from a Friedman Rank test.

UpToDate was found to be significantly more popular amongst students from USA and Canada. ($p<0.001$).

Most popular sites	
Site	**Mean Rank**
Wikipedia	5.99
Medscape	5.07
PubMed	4.33
BMJ Online	3.43
UpToDate	2.96

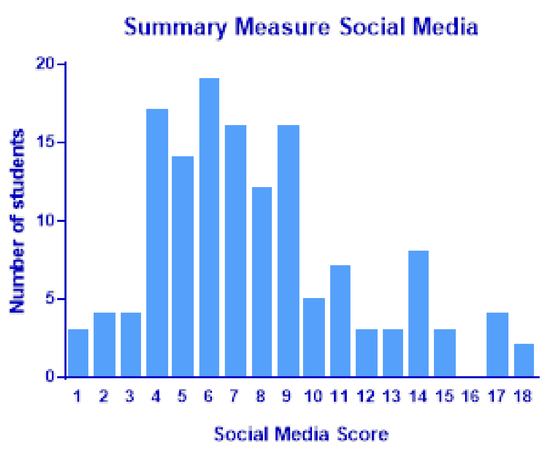
Programmes
The most commonly used programmes for learning (taking frequency of use into account) are displayed here.
Popular uses for these programmes included:

- Making presentations/notes
- Storing files online
- Sharing notes
- Viewing notes across multiple devices

Most popular programmes	
Programme	**Mean Rank**
Microsoft Word	4.76
Microsoft PowerPoint	4.41
Dropbox	4.18
Google Docs	3.65
Evernote	2.02

Social Media
The most commonly used social media sites for learning (taking frequency of use into account) were YouTube, Facebook, and Twitter.

A summary measure was calculated similarly to devices, and scores are displayed here. The mean summary measure was 8, most students scoring between 4 and 9.



Conclusions:

Devices
Device ownership is widespread, and usage is common (the average being one device twice a day).

Websites
The most popularly used website was Wikipedia, which raises the issue of students not using reliable sources of information. Other frequently used sites included more evidence-based and peer reviewed sites such as PubMed and UpToDate.

Programmes
Popular programmes were mostly Microsoft-based. Students can create presentations and notes, and even share them online. Learning institutions could purchase student packages for downloading these programmes, in order to encourage their use.

Social Media
YouTube was the most popular social media site for use. Students used it for watching visual tutorials, clinical skills and surgical procedures.

This shows an opening for educators to do two things. Firstly, they can review and recommend videos already available on YouTube to their students. Secondly, YouTube provides a medium for educators to even create their own videos and share privately amongst the institution or publicly. One big challenge to incorporating social media into medical education is data protection, and students need training in online patient confidentiality.

Final word:

Students are generally technologically literate. This study indicates room to incorporate more TEL into medical education.