AN INITIAL EVALUATION OF TABLET DEVICES & WHAT ARE THE NEXT STEPS?

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ABSTRACT

This paper describes an evaluation of tablet devices for a Graduate Entry Medical School (GEMS). The purpose of this evaluation is to assess what type of tablet device could meet the needs of a GEMS student. GEMS requirements for the evaluation include; using the tablet device to replace paper teaching resources in lectures and tutorials and students must be able to edit the electronic resources in class. The tablet device is also considered for its suitability on clinical placements in third and fourth years, where students need a tablet device that allows them to take notes and access GEMS resources. The study evaluates four leading tablet devices; Apple iPad Air & iPad Mini, Samsung Galaxy Tab S 10.5 and Microsoft Surface Pro 3. The methodology section will cover the assessment criteria used to compare tablet devices from the student, technical and GEMS management perspective. A questionnaire was also developed to gather feedback from students at the end of their time with each tablet device. Time constraints and tablet device availability meant that testing was carried out with a small number of medical students. The iPad Mini was chosen by GEMS as the overriding opinion was to go with the interface and device size most favored by the student participants in the evaluation. The author concludes with three standout challenges to consider; changing perceptions, network infrastructure and training and support.

KEYWORDS

Tablet device evaluation, clinical mobile technologies.

1. INTRODUCTION

The BM BS Graduate Entry Medical Programme (GEMP) is a four-year medical degree open to graduates from any discipline. In years 1 and 2, the curriculum is structured around Problem-Based Learning (PBL), supported by a small number of lectures, structured clinical and anatomical skills classes in addition to tutorials and seminars. During years 3 and 4, clinical training is based off campus; in hospital sites and GP surgeries. On clinical placement, students must engage in independent learning and investigate issues at the bedside/in the clinics themselves utilising a combination of electronic resources provided by the University and the Health Service to answer queries and provide evidence to support their diagnoses. The Education Technology Section was approached by the Director of Education at the Graduate Entry Medical School (GEMS) to facilitate the evaluation of tablet devices. The purpose of this evaluation is to assess how a tablet device could meet the needs of a GEMS student. As a result of discussions with GEMS staff they provided the following requirements. The tablet device must display all GEMS online course materials and the device should be as maintenance free as possible. As this will be a student purchase, it is preferred if no pre-loading of software by GEMS tech support is needed. Instead of using GEMS paper teaching resources in lectures and tutorials, student should have access to teaching resources using the tablet device. Using the tablet device GEMS students will need access to GEMS course notes, resources, the Internet and note taking facilities on clinical placement.

2. METHODOLOGY

This is a device evaluation project that examines tablet devices from student and technical perspectives. Combining the Medical School requirements outlined in the Introduction and from consultations with GEMS

staff, two student usage scenarios for tablet devices became apparent; on-campus use in lectures and tutorials and off-campus use on clinical placement. The author created two tablet device assessment lists and a student questionnaire. The project looked at four leading tablet devices, covering three different operating systems and user interfaces; Apple iPad Air & iPad Mini, Samsung Galaxy Tab S 10.5 and Microsoft Surface Pro 3.

2.1 Tablet Assessment Lists and Student Questionnaire

The following tablet assessment lists were developed to guide the Educational Technology Section and GEMS staff when comparing all four tablet devices. Table 1 lists criteria from the student perspective. Table 2 lists criteria for the purchase process and device rollout from the GEMS staff perspective, which will be of use once a decision is made on the device and reseller.

Table 1. Student Considerations for GEMS Tablet Selection

Tablet Assessment Criteria
Cost to student - device, protective cover, insurance
Portability – weight and overall size
Screen – quality and size
Battery Life
Protective case – options and keyboard functionality
Touch pen
Device memory
Cloud based services – storage, sharing and saving work
Access to GEMS course content and teaching resources
Content creation apps
Technical support for students
Screen damage – warranty or accidental damage cover
Connectivity to hardware in GEMS lecture/study/meeting rooms
Device updates

Table 2. Staff Considerations for GEMS Tablet Selection

Tablet Assessment Criteria
Purchase process via reseller
Device delivery and rollout
Maintenance and servicing
Device insurance – what is covered
Test accessing of GEMS content and systems
Potential management of devices
Life expectancy of tablet device versus course duration
Lecturing staff may look for the same device
Use device in lecture theatres – projector connectors
Apps development for GEMS content – one location for content links

The tablet device evaluation project approached educational resellers about this study and procured on loan for one month three Apple iPad Airs, three iPad Minis, one Samsung Galaxy Tab S 10.5 and three Microsoft Surface Pro 3s. The GEMS Senior Technician recruited the student class representative from each year of the medical degree to take part in user testing over the course of the month. This selection covered students on campus in lectures/tutorials and students off campus on clinical placement in general practice or hospitals. The GEMS Senior Technician briefed the students before they used each tablet device. Each of the students tested all four tablet devices, spending one full day with each. Instead of using GEMS paper resources in the various teaching sessions, when testing a tablet device on campus, the students were asked to access GEMS electronic resources using the tablet device. When testing a tablet device off campus, the students were asked to use the tablet device to access electronic resources, the Internet and note taking in the GP office or hospital ward. When the students handed back a tablet device, the GEMS Senior Technician asked them to fill out a questionnaire. The questionnaire looked to establish what experience the student has currently with mobile devices. The questionnaire listed the GEMS electronic resources and asked students to comment on any difficulties they may have experienced while accessing the resources. The students were asked about the interface look and feel, mobility of the device in different locations and what apps, if any did they use.

3. RESULTS

Taking into account the requirements discussed in the introduction, the student usage scenarios (on and off campus), compiling questionnaire responses and assessment criteria results, two devices stood out for consideration; the iPad Mini and the Microsoft Surface Pro 3. It became clear from the questionnaire responses that students were very familiar with the Apple interface and as a result were very comfortable using the iPad Mini. Students found the interface intuitive and the iPad Mini size is very compatible with carrying and using apps on clinical placement. Students specifically commented on how easy it was to carry around during testing. Not all of the GEMS teaching resources were accessible to students on the iPad Mini. Students would need to download an extra App to view Flash content and there is no guarantee this will work with all Flash based files. Students found the iPad Mini slow and difficult to use when adding notes to GEMS teaching notes in class. With the iPad Mini it is estimated there is a device refresh rate of two years. It was recommended that this may be a purchase to consider for students just before clinical placement in year 3 instead of a year 1 purchase. The Microsoft Surface Pro 3 received positive feedback from testing as students were comfortable with the Microsoft interface and applications. The Microsoft Surface Pro 3 displays all GEMS teaching resources, with no extra applications needed and the accompanying Pro Pen allows students to edit class resources. The Surface Pro 3 is considered a cross between a laptop and a tablet with an estimated device refresh rate of four years. It was recommended that this would be a good purchase for students entering year 1 and would serve them as a laptop and classroom tablet for their degree duration. However, student feedback from year 3 and 4 commented that its size and weight made it cumbersome for portability on clinical placement.

The Samsung Galaxy received positive reviews for its portability, slim and comfortable feel. However, students in this study had limited experience with Android devices and as a result found the Samsung Galaxy difficult to navigate, sometimes having difficulty finding Apps. Students commented that the home screen was not as intuitive as the iPad Mini/Air and the Samsung Galaxy has three buttons at the bottom of the tablet compared to one button on the iPad Mini/Air. Feedback in relation to the iPad Air was almost identical to the iPad Mini. The neat size of the iPad Mini made it the stand out from the two iPad devices tested. Despite the iPad Mini not meeting the technical requirements initially laid out at the beginning of the evaluation, the iPad Mini was chosen by GEMS as the device for the September 2015 cohort of year 1 GEMS students. The overriding opinion of GEMS management was to go with the interface and size most favored by the student participants in the evaluation.

4. CONCLUSION

4.1 Limitations of Study

A combination of time constraints and tablet device availability for the evaluation meant that testing was carried out with four of the existing medical students, one from each year of the course. Participating students had only one day with each tablet device. The Author notes it was an opportunity missed that lecturing staff were not included in this evaluation to provide more possible usage scenarios for tablet device integration into the medical degree.

4.2 Next Steps

As the first cohort of students with iPad Minis are currently in their second semester, the next step for this study is to evaluate usage of the iPad Mini again and compare findings with the initial evaluation. The advantage now being, that instead of only four students in the initial evaluation, there are currently 130 first year students using the device for almost two semesters. Topics to cover in the second evaluation include; apps usage, training, support and wireless connectivity. The GEMS iPad Mini was preloaded with five licensed medical apps funded by GEMS and an analysis will be carried out looking at what apps GEMS student's access most frequently. According to Boruff and Storie (2014), many of the resources mentioned by participants in their research used free apps such as Medscape and Epocrates and many used Google as a

search option when they didn't have time to access library resources. The Boruff & Storie (2014) study also highlighted the importance of adequate training and support as their participants stated a preference for workshops on how to use mobile devices distinct from workshops on how to use medical resources on mobile devices. Drop-in troubleshooting assistance should be available along with online how-to guides specific to the institution. The second evaluation will look at ongoing training and support and how the initial tablet device roll out was perceived by GEMS students. Wireless connectivity has been identified as an important consideration to a successful tablet device implementation. Stringer & Tobin (2012) in their study identified the engineering of Stanford University's wireless network to accommodate a larger number of wireless devices, in some cases three devices per person (laptop, smartphone and iPad) as the primary technical hurdle.

4.3 Future Potential

The SAMR model developed by Puentedura (2013) will be used as a framework to guide further integration of tablet devices into the GEMS medical degree. The introduction by GEMS of a tablet device to replace paper teaching resources in lectures and to enable notetaking and access to GEMS resources on clinical placements achieves the substitution stage of the SAMR model where technology acts as a direct tool substitute. Future potential to progress to the transformation stages of the SAMR model can be seen from existing studies by O'Donovan & Maruthappu (2014) and Fabian & MacLean (2014). Both studies used video conference and video recording capabilities on tablet devices to facilitate peer review and assessment. The introduction of tablet devices into a curriculum is a huge undertaking that goes far beyond the selection of a device; it is a project that presents many challenges. The author concludes with three standout challenges. Changing perceptions – how to encourage the extension of tablet device capabilities beyond just searching and reading. Network infrastructure – how to ensure wireless access can support multiple user devices. Training and support – how to adequately provide knowledge on what resources and applications are available and understanding how to use them.

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