Use of mobile technologies for undergraduate medical student workplace based assessment: a practical application

Context

The latest AMEE Guide to e-learning in Medical Education recognises the increasingly important use of mobile hand-held electronic devices in medical education and in this article we describe our experience of the use of these devices for undergraduate medical student workplace based assessment (WBA).

An essential aspect of WBA is its formative, or ‘assessment for learning’, aspect that combines the need of faculty to track student attainment with feedback that identifies student learning needs (Norcini & Burch 2007). A range of WBA tools are in widespread use, such as the mini clinical evaluation exercise (mini CEX), that allow opportunistic assessment and immediate feedback. This type of self-directed, personalised learning is attractive to learners and has been introduced into some undergraduate programmes (Kogan 2002; Torre 2007). Problems have been identified in the majority of WBA programmes as assessors and learners are required to complete an online checklist, but this can prove difficult in busy clinical environments where IT access may be required for other purposes. Compounding this difficulty are identified problems due to poor feedback from assessors, poor reliability metrics and a lack of clear linkage to learning outcomes (Norcini & Burch 2007).

A small amount of work has been conducted within postgraduate environments to evaluate the use of mobile technology to deliver learning and WBA. Potential benefits on learning cultures have been identified, with greater freedom and flexibility of the learning and assessment process (Finlay 2006, Koskimaa 2007, Axelson 2007).

Activity

A group of thirteen final year students were asked to complete a minimum of 8 mini CEX assessments within a 10-week formative programme of remediation during the summer of 2007. Assessment forms were digitised and m-Forms software® used to convert the assessment for use on a PDA (Personal Digital Assistant). A supporting IT platform, networked with the School, allowed remote synchronisation of the devices and the opportunity for students and clinical teachers to review existing assessments.

Students underwent a 90-minute training and familiarisation session using the devices, and a ‘helpdesk’ created to advise and deal with problems. As the remediation programme was delivered across a number of locations across different teaching hospitals, it was considered to be impractical to attempt training for the clinical teachers. As mini CEX is a core
component of postgraduate assessment portfolios in the UK, a pragmatic approach was adopted, with an assumption that clinical teachers would have experience of either using the tool for assessment (senior doctors) or being assessed (junior doctors).

**Evaluation**

Multiple sources of data informed the evaluation:

- Interrogation of the data collected on the PDAs, including quantitative and qualitative analysis of feedback
- Student questionnaire and subsequent focus group (grounded theory, thematic analysis)
- Assessor questionnaire (thematic analysis)

Despite being asked to undertake 8 assessments per student, 196 mini CEX encounters were recorded (median 15 per student, range 8-25). 80 assessors took part (41 junior doctors, 29 senior doctors, 10 Allied Health Professionals) and written feedback was extracted from 130 (67%) of these encounters (some audio feedback was additionally recorded for other encounters).

Interrogation of the written PDA feedback revealed key themes around student progress. A clear pattern of ‘stories’ linking goals, progress and the agreement of further learning and performance targets emerged in 75% of encounters. Twelve students took part in the questionnaire and focus group, and the principal emergent theme was that formative mini CEX provided focus, with a clearer sense of goals and increased confidence:

> “I think that with the device I felt much more focussed towards particular goals and it was also a good way for me to keep an eye on how I was doing”

Feedback about the use of mobile learning also challenged some assumptions about the ‘Net Generation’, with students reporting uncertainty prior to using the mobile devices. However, training appeared to be beneficial and the multiple concurrent uses of the devices also helped this process (email, web access, learning resources). Students also reported that the devices acted as an ‘ice breaker’ for their contact with the clinical teams. This latter point resonated with an observation by students that many junior doctors (who performed the majority of assessments) were seen using PDAs.

Assessors reported few problems with the use of the mobile devices for WBA. It is interesting that a principal theme from assessor responses was the impact on their own teaching styles:

> “Regular assessment in this fashion meant they [the students] were constantly seeking feedback on their performance and also we were forced to directly observe tasks we may previously have let them complete alone. I think this allowed students early feedback on weak and strong areas and allowed them to quickly work on improving them.”

And

> “It guides feedback in a constructive way and helps set targets for development. It also acts as a great opportunity to praise students and raise self confidence in areas of practice they are competent at.”
Conclusion

This pilot study has demonstrated the successful delivery, from student and assessor perspectives of mini CEX within an 'everyday' practical setting by using a mobile device.

Why has this ‘proof of concept’ study generated such positive results? It is difficult to separate out contributory factors but it is important to note that the students are likely to be highly motivated to learn (as they were re-sitting finals). It is notable that the use of mini CEX built on student confidence, improved their ‘ownership’ of assessment and goals and also increased faculty engagement in the process. Students saw significant value in this process and engaged in far more formative assessment than was required.

Engaging students and assessors in high quality, learning oriented assessment can be challenging, but it is clear from this pilot study that the use of mobile handheld technology can provide significant opportunities in delivering much more customised learning and assessment, in a way previously unrecorded with paper or desktop PC delivery of WBA.

References


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