

Using handheld computers (PDAs) to enhance the clinical learning experience.

Introduction

The aim of the project had 2 distinct arms related to the objectives stated above:

- To provide academic support and resources for students whilst on clinical placement;
 - Reinforcing the link between academic theory and clinical practice.
 - Development of mini mobile tutorials - 'learning packages'
- To facilitate efficient collation of clinical objectives;
 - Including timely reflection.
 - Development of interface between mobile and web mounted clinical database.

Method

Participatory action research

- Students as active partners, evaluating and suggesting improvements to the use of PDAs and the content and accessibility of learning packages.
 - Analysis of learning styles of students to ensure propriety of format used - VARK[®] learning styles analysis.
- Continuous cycle of checking, reflection and action on findings throughout project.

Sample

- Limited to number of PDAs available - 8 handsets
- Purposive: 2nd year cohort - 8 volunteers at one clinical placement site.

Evaluation strategy

- Mid way through placement - questionnaires
- At end of placement
 - Focus group - students
 - Face to face interviews - practice educators

Findings

- Learning packages.

VAR[®] analysis identified the preferred learning styles of the majority of the cohort as visual and / or aural. No student was identified as having a preferred learning style of read / write and one student was identified as having an equal preference of kinaesthetic and visual. This analysis suggested that an optimal approach would be to develop learning packages with content using images and voice over narrative.

Initial packages were developed using Microsoft PhotoStory[®] to create narrated mini-tutorials relating to radiotherapy equipment, radiotherapy technique and radiographic sectional anatomy. These were evaluated by the students mid way through placement with feedback suggesting that the PhotoStory[®] format was unsuitable;

'I would prefer PowerPoint[®] - more control over the slides'

'More text please' and 'Text would be better'.

There were also issues with the voice over, ranging from personal preference, 'I don't like hearing the lecturers' voices!', to the practicalities of not being able to hear the narrative in the clinical environment due to the background noise of machinery and day to day clinical activity.

Packages were then recreated using PowerPoint[®] and text. The size of text used was selected to ensure readability for use with the PDAs. Further packages for skin care advice and kilovoltage physics and technique were then created.

Final focus group evaluation of the packages was positive with students stating an appreciation of the accessibility of the learning resources as preparation for clinical assessment. Students also noted that it was good to be able to see physics, anatomy and radiotherapy technique combined together, reinforcing the relevance of academic learning to clinical practice. Students also made suggestions for further

packages for revision and reference resources which, it is intended, will be undertaken as joint projects between staff and students.

- Collation of clinical objectives

Working with an external software developer, a mobile interface was created between the PDA and the current web mounted clinical database, InPractice[®]. This relied on the application Windows Mobile 6[®] to be able to transfer information from the PDA to the database. Initially the PDA was used as a conduit for passage of information from the PDA directly to the web via a WiFi connection. Connectivity problems related to Mobile 6[®] proved costly as information was lost during transfer. To try to overcome this problem, the context of the PDA was changed to act as a storage device until the information could be downloaded to a PC. Unfortunately, the connectivity issues persisted, causing further frustration and delays in downloading information. This also created some resistance to the introduction of the technology with students and practice educators.

These issues introduced expenditure that was not budgeted for in the initial bid; we accrued additional costs for the software consultant's time for remedial work as well as the scheduling of several extra meetings for negotiation and problem solving. The timescale of the project was also compromised, creating difficulties with the timing of students' clinical placements. Final negotiations have resulted in an agreement with the software consultant to set up a trial whereby students use their own 3G mobile phones as a multiplatform connection device to link to the database and bypass Mobile 6[®] and its associated problems. If this is successful, the PDAs would be retained as devices for delivering mobile learning resources only.

At the outset of the project, students and practice educators expressed concerns related to loss of or damage to the PDAs. Initial assumptions of familiarity with such technology were incorrect as neither group were confident with using them. Over the extended period of the project, however, attitudes and confidence have noticeably changed since most staff and students now use smartphones and are more accustomed to using interactive technology.

Conclusion

Clinical learning is reinforced when underpinned with academic theory which in turn bolsters the relevance of theoretical learning to professional practice. Learning resources that are accessible and available when and where required in the clinical environment enhance the students' learning experience. With the students in this study, PDAs provided the platform for timely access to learning resources which was reported to facilitate the link between theory and practice. Although preferred learning styles were evident, practicalities of using the technology in the clinical environment created barriers to the use of audio resources for aural learners and all students fell back to their 'comfort zone' of read/write, text based learning. Problems with software connectivity caused frustration and resistance to the use of technology for the collation of clinical objectives and ways to overcome this need to be sought in order to continue to enhance the student experience.

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