

# [P9] Use of PharmaCALogy software in a problem based learning programme to teach pharmacology for extended and supplementary nurse prescribing

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## ABSTRACT

Pharmacology is taught on a module dedicated for nurse prescribers who have a limited physical science background. To facilitate learning a problem-based approach is adopted, to enhance students' knowledge of drug action a software PharmaCALogy package was used. Students were alternately given a lecture or encountered the software as a prelude to a short test a week later. The process was repeated with their roles reversed, followed by use of a questionnaire to evaluate user experience. Generally students receiving the lecture performed better on the test but after experiencing both forms of learning there was little difference between test performances. Response was positive with regard to the software especially the aspect of visualising drug interactions. However, lack of prior knowledge and paucity of time on task were seen as negative features. The responses indicate measures that may improve the student experience by taking greater note of learning styles and existing IT skills.

## INTRODUCTION

'Advanced Pharmacology for Supplementary and Extended Prescribing Practice' is a dedicated module provided for post-registration nurses in part fulfilment of a course that enables them to operate as extended and supplementary nurse prescribers. A problem based learning

approach has been used on this module whereby students approach a study of drug action from the perspective of their immediate life/work experience. To aid the process, one lecture to emphasise the nature of drug targets is given. Though appreciated by students, the practice was at odds with the module philosophy on the basis that problem-based learning is constructivist in its approach, allowing students to participate in their own learning process. To replace this rather instructivist element, the current study was initiated with a view to the eventual replacement of the lecture by the students' own active interaction with dedicated pharmacology software. The study sought to review the effectiveness of learning via the computer assisted medium set against the learning achieved by the more traditional lecture.

## METHODOLOGY

Thirty post-registration nurses from a variety of professional backgrounds studying the module were divided into two groups, A and B. With one exception all were female and aged between 30 and 55. In the first week Group A undertook a study of the topic 'Drug Targets'. The students were supported by two members of the module team and provided with instruction sheets, which also contained questions to provide a focus for working through the software.

**Table 1: Results of test for students one week after 1st lecture or software presentation**

	Experience	n	Mean (%)	Standard deviation
Week 1 Group B	Lecture	8	45.13	17.89
Week 1 Group A	Software	13	26.92	13.31

$p < 0.007$

**Table 2: Results of test for students one week after 2nd lecture or software presentation**

	Experience	n	Mean (%)	Standard deviation
Week 2 Group A	Lecture	11	57.73	13.30
Week 2 Group B	Software	8	58.13	21.03

$p > 1.74$

**Table 3: Results of test for students one week after receiving lecture presentation**

	Experience	n	Mean (%)	Standard deviation
Week 1 Group B	Lecture	8	45.13	17.89
Week 2 Group A	Lecture	11	57.73	13.30

$p < 0.05$

**Table 4: Results of test for students one week after receiving software presentation**

	Experience	n	Mean (%)	Standard deviation
Week 1 Group A	Software	13	26.92	13.31
Week 2 Group B	Software	8	58.13	21.03

$p < 0.001$

**Table 5: Results of test for all students (both Groups combined)**

	Experience	n	Mean (%)	Standard deviation
Week 1 Group A+B	either	21	33.86	17.33
Week 2 Group A+B	either	19	57.89	16.44

$p < 0.02$

Students were encouraged to work in pairs rather than encounter the software experience on their own. At the end of the session, the students were provided with the answers to the questions. Group B students were given a conventional Powerpoint lecture on the same topic; the structure of the lecture was assembled to match the content of the computer software as closely as possible. One week later, both Groups were assessed by means of a short 10-question test. Then Group A received the conventional lecture whilst Group B experienced the software presentation, following the same procedures as in the previous week. One further week later, both groups completed the same short 10 question test and also answered a 20 point questionnaire to evaluate their experience of the use of dedicated software. Students were asked to respond on a five point Likert scale (1 = strongly agree to 5 = strongly disagree).

## RESULTS AND DISCUSSION

Test results showed a significant difference between the groups, the students in receipt of the lecture gaining a far better grade than students who used the software (Table 1,  $p < 0.007$ ). However, a week later, following a cross over between the groups (so that those who received the lecture in the first week used the software and vice versa), the test results showed virtually similar marks and demonstrated no significant difference between the groups (Table 2,  $p > 1.74$ ).

Tables 3 and 4 compare the results of students for the lectures and software between week 1 and week 2. There is some improvement in test performance in the second week comparing lecture group from week 1 with that in week 2, the difference is just about significant ( $p < 0.05$ ) but there is a considerable improvement between the two software groups from week 1 to week 2 which is significant ( $p < 0.001$ ). Pooling the data (software users plus lecture recipients) suggests a general improvement in test

performance from week 1 to week 2, which is statistically significant ( $p < 0.02$ ).

The results suggest initially that the lecture may be a more effective medium whereby students acquire knowledge, however by the second week there is no real difference between the groups. As a positive comment, to achieve an average score of nearly 60% might be considered successful learning. However it does suggest that a blend of conventional delivery with computer assisted learning is the more effective process, and that on the basis of improved knowledge of subject content it may not be appropriate to use the software on a stand alone facility in its current form of use (Andrrewartha, G. and Wilmot, S. 2001).

## REFERENCES

- Andrrewartha, G. and Wilmot, S.** (2001) Can multimedia meet tertiary educational needs better than the conventional lecture? A case study. *Australian Journal of Educational Technology* 17, pp 1-20