	University	**Strathclyde**
	Department	**School of Pharmacy**
	Module	**Pharmacy Practice 3**
	Overview	Pharmacy Practice Three (PP3) is a third year class of approximately 240 domestic and overseas students. PP3 is designed to develop and evaluate students' ability to dispense pharmaceuticals against a range of prescription types. Formative assessment include weekly 3 hour lab sessions and tutorials. During lab sessions students are required to simulate the entire process of dispensing prescriptions including dealing with the patient (role played by the tutor), fulfilling legal requirements to labelling and dispense drugs from the laboratory store. PP3 is summatively assessed by two, two hour class tests and a three hour examination, during which students must dispense four or five prescriptions accurately. Each student begins the assessment with 100% and marks are deducted for errors, with a threshold of 50% constituting a pass mark. Critical errors such as dispensing an illegal prescription or an overdose result in an automatic fail and can lead to students receiving very low marks.
	Drivers for change	Existing timetabled laboratory sessions offer limited opportunities for students to practice their dispensing skills and obtain one-to-one feedback from tutors. This is an intensive and time-consuming activity which can limit exposure to prescriptions in timetabled sessions. Although the class schedule includes a number of hours allocated to private study, students working by themselves have little or no opportunity to engage with real prescriptions, other than studying the class notes and this lack of opportunity for private study has resulted in student criticism of the course design. Teaching staff recognise that more opportunities for students to practice dispensing have the potential to improve the pass rate, but it is not possible to provide increased one-to-one feedback opportunities during tutorials because of limitations on staff and student time and on course scheduling.
	Intervention	Since 1998 the School of Pharmacy has developed a bespoke virtual learning environment (VLE), SPIDER. An online tutorial ('Rx Tutor') within SPIDER comprising a database of prescriptions was developed with REAP funding by the project team in collaboration with a group of six fourth year MPharm students. An initial set of nine simulated prescriptions, covering a range of prescription types replicating those taught in lab sessions, was evaluated by 135 students in 2005-06. During the summer of 2006 the database of was extended to 300 prescriptions. During 2006-07 sets of prescriptions linked to lab sessions have been made available to students on a limited time release basis. During the lead up to summative assessments these restrictions have been removed. The introduction of the Rx Tutor has been a supplemental intervention designed to support face-to-face laboratory sessions. The Rx Tutor is designed to offer students enhanced formative opportunities to practice dispensing skills outside existing timetabled lab sessions and to receive feedback on their performance without requiring additional staff input.
PROCESS **EMPOWERMENT** NICOL'S 7 PRINCIPLES OF GOOD ASSESSMENT DESIGN		**Activities**
	Principle 1 (clarify criteria)	(1) Students engage in repeated learning cycles at different levels (e.g. repeating the same type of prescription and repeating different types of prescription with the same answer framework). (2) Prescriptions were matched to specific lecture blocks and performance goals progressed incrementally. (3) Good performance is reinforced linking activities in lectures, labs and tutorials.
	Principle 2 (self-assess, reflect)	(1) Students had an opportunity to self-assess their contributions on different levels. The Rx Tutor provides immediate feedback after completing each prescription prompting reflection. (2) Students can self-evaluate their performance against the feedback provided. (3) Individual feedback for each prescription in the Rx Tutor is categorised and recorded in the students own ePDP so that they can gauge their overall performance and identify strengths and weaknesses.
	Principle 3 (tutor feedback)	1) During lab sessions students receive individualise personal feedback on performance 2) During tutorials students receive generic class-wide feedback on performance
	Principle 4 (peer feedback)	1) Informally students engaged in peer dialogue working on prescriptions in small groups (e.g. pairs), engaging in discussions around a collective response before engaging in further discussion around feedback provided by the Rx Tutor. 2) Students also engaged in informal debate around individual feedback provided by the Rx Tutor making general comparisons.

ENGAGEMENT GIBBS & SIMPSON'S 4 CONDITIONS OF TIME & EFFORT ON TASK	**Principle 5** (motivation)	1) Using the Rx Tutor allowed students to take personal responsibility for monitoring their own learning, at a time and place of their choosing. Thus the process of developing self-regulation was enhanced. It was intended that the increase in autonomy would have a beneficial effect on motivation and self esteem. 2) Students gain confidence by being able to use the Rx Tutor for exam revision. 3) Students gain confidence by being able to rehearse problem solving procedures.
	Principle 6 (close feedback loop)	1) With the Rx Tutor students gain understanding by receiving immediate feedback. 2) Students undertake repeated cycles of learning utilising the same answer framework. 3) Opportunities for clarification exist at multiple levels (i.e. Lab/Tutorial/Rx Tutor).
	Principle 7 (shape teachng)	1) Staff can gain feedback through monitoring overall performance of the cohort, enabling the identification of common misconceptions for clarification during tutorials.
	Condition 1 (in and out of class)	1) Topics covered in class are mirrored in the Rx Tutor providing students the opportunity to reinforce experience with practice. 2) The flexibility of the online Rx Tutor enables greater ease of access allowing students to take responsibility of their own learning.
	Condition 2 (spread evenly)	1) Different prescription types are released progressively throughout the year so that the Rx Tutor mirrors face-to-face activities.
	Condition 3 (deep not surface)	1) Students can ensure that they are engaging in the appropriate kind of study by reviewing individual and accumulative Rx Tutor feedback and oral/written feedback from lab sessions. Students have informal opportunities to reflect and discuss this feedback with their peers and tutors. This encourages them to think at a deeper level about learning in and out of class time.
	Condition 4 (high expectations	1) Students gain a knowledge and understanding of clear and high expectations through the strict marking regime which is reinforced in lab sessions and the Rx Tutor
OUTCOME	**Efficiencies**	1) The development of the Rx Tutor has required a one-off investment in staff time and cost. This investment is however reusable in future years with minimal reoccurring costs for maintenance. The investment also represents substantial gains in the volume and detail of formative feedback accessible by students out-with the timetabled laboratory and tutorial sessions which in particular has eased staff workload prior to exams as the Rx Tutor is extensively used as a revision aid.
	Informal Learning Gains	1) Student focus group responses highlight that using the Rx Tutor enabled students to highlight areas for further study 2) Students reported that the Rx Tutor was a useful aide for reflection 3) Student focus group responses and staff interviews indicate that students consider the new system to offer them more flexibility in their learning
	Formal Learning Gains	1) With the introduction of the Rx Tutor pass rates at first attempt have increased year-on-year: 2004 68% 2005 71% 2006 81% 2007 87%