



## The Village Pharm: Flipping the classroom to enhance the learning of pharmaceuticals and associated professional skills

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**Abstract:** A growing body of knowledge in Pharmacy has made it increasingly difficult to keep abreast of current knowledge and developments in disease prevention and treatment. It has been suggested that in the face of this ever-changing knowledge environment, it is essential to help students develop professional capabilities in classroom (Blouin et al., 2009). Here we present an experiment called the village pharm – a model that used the flipped classroom concept. Our aim was to teach students professional skills in context, mirroring key skills including communication, empathy, cultural and ethical awareness expected of health professionals. Using auto-ethnography, we present our design, reflection and analysis of how learning unfolded in a flipped classroom and the lessons we have learnt to make improvements for the future. We believe this will be useful for academics wishing to use flipped classroom and technology to help students develop key professional skills inherent to their discipline.

Keywords: flipped classroom, video animations, professional learning, auto-ethnography.

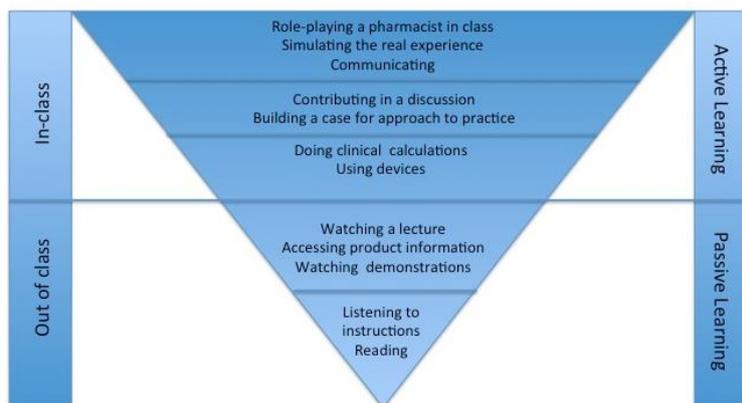
### Introduction

Pharmacists are health practitioners employed in the fields of community, hospital and industrial pharmacy. In addition to dispensing drugs there is a growing recognition of the importance of clinical pharmacy services in patient care and the associated acquisition and interpretation of knowledge required for the dissemination of information to patients (Ried & Posey, 2006). Pharmacists also provide information and advice to medical practitioners about optimal drug therapy and disease state management as well as educating allied health professionals on the quality use of medicines. A unique aspect that pharmacists bring to the health care team is the knowledge and skills in the area of pharmaceuticals, a discipline of pharmacy that particularly deals with the process of turning a new chemical entity into a medication, and the design of devices for the delivery of medications to patients.

Noble et al (2011) noted that often it is assumed in the pharmacy curriculum that if students acquire the necessary knowledge and skills they will “become” pharmacists. However, in the new paradigm of pharmacy practice, a curriculum that focuses on acquisition of knowledge and skills may not develop the required professional skills and capabilities. It was proposed by these authors that a curriculum needs to afford students

the opportunity “to do” and “to be” pharmacists and in so doing, not only does learning occur but the student learns to think, act and do things differently.

The existing approach to teaching pharmaceuticals in our Pharmacy program consisted of traditional lectures followed by tutorials. This provided little opportunity for our students to practice being pharmacists. It was also evident through feedback from other academics and pharmacists that even towards the end of their degree, students were unable to use and communicate their pharmaceuticals knowledge in problem solving clinical scenarios. With these factors in mind, it was decided to redesign the pharmaceuticals course in the first year of the degree allowing students the opportunity to practice being pharmacists. In this paper we present our model “the village pharm” - a technology assisted case-based approach to learning pharmaceuticals and associated professional skills in context, which was built around the concept of flipping the classroom as illustrated in Figure 1 below.



Adapted from Edgar Dale, Audio-Visual Methods in Technology (Holt, Rinehart and Winston, 2008)

Figure 1: Our model of flipped classroom

## Development of the “Village Pharm” model

The development of this model involved changing the way the final pharmaceuticals course was delivered to students. Information and content in the course was delivered using pre-recorded audio-visual presentations – replacing the traditional lectures and tutorials. The audio-visual presentations were created using Adobe Captivate® and Articulate Pro® and were made available online through Blackboard. Tutorials were changed to facilitate patient focussed learning (real-world learning) instead of examining pharmaceutical products or devices and answering directed questions, which was product-focussed learning. The concept of the “Village Pharm” was thus conceived to provide an overall context for case studies students were required to work with throughout the course. The village pharm is a virtual village and students are welcomed into the course and the village Pharm as the new pharmacist to work at both the local hospital and community pharmacy. The case studies involved residents of the village of different ages, some from the same family and others who were teachers or health professionals working in the village. In order to make the case scenarios more realistic, animations were created using Crazytalk Pro(R). These animation videos with speaking characters were used to present the case scenarios. An example of the animation is shown in Figure 2 below.



Figure 2: Example of character in an animation video created using Crazytalk Pro®

In some case scenarios, students are required to work as a group to produce resources that would be used in some aspect of health care in the village. In other scenarios, students are required to role-play being either a pharmacist or the patient/health professional receiving advice. For the case scenarios, students are required to work collaboratively in defining the problem, identifying learning goals, planning their approach to learning and then synthesising the outcome. To assist them with this approach, students are introduced to the continuing

professional development cycle (CPD) in an introductory session in the first week of the course. The cycle of identifying learning goals, planning how to address learning goals, addressing learning goals and evaluating/assessing outcome was explained to them. The importance of learning to use this CPD as part of their professional development is also emphasised. In the introductory session, students are guided through an example case study by the tutor and lecturer. Throughout the course, students are required to document their learning in a learning portfolio. This portfolio should be constructed around the learning goals for each case study, providing artefacts, personal reflection on their learning as a pharmacist.

## **Data collection**

An auto-ethnographic approach was used to collect, analyse and synthesise our experiences in developing and implementing this model. Auto-ethnography is a form of qualitative research that analyses documented self-reflection of the researcher's personal experience, connecting it with wider culture, meanings and understandings inherent within a context. The context here is the flipped classroom and data was collected in the form of critical reflection, documented as a narrative. The process of critical reflection is an integral part of teaching practice and involves reflection in action, reflection on action (thinking retrospectively) and reflection for action (thinking and planning for future teaching practice). The data collected for this research involved personal reflections of the lecturer and the tutor. Thoughts about the redesigned course in action, on action and for action were documented by reflecting on the experiences of teaching the course, student learning experiences, peer feedback and the vast body of knowledge from the literature on student learning in higher education. Data was also obtained from student feedback on course survey conducted by the University and from an online questionnaire in which students were invited to reflect on their learning experience.

## **Analysis and synthesis of results**

Based on data obtained using the auto-ethnography approach, it was apparent that many students were unprepared and felt unsettled when they were asked to take responsibility for their learning. Students also requested different formats for information and resources besides the audio-visual material, with some requesting printed material. Students reported that they initially struggled with having to determine learning goals for the tutorial scenarios but this appeared to improve with practice. They felt that number of scenarios included in the tutorials was overambitious and made it difficult for them to spend sufficient time to master the skills required. However, students expressed concern about the final exam for the course which they were informed would require application of learned skills and knowledge to scenarios rather than just regurgitation of information. Students also found the workload heavy and worried about the final exam.

Data collected from the lecturer and tutor evaluation of the course painted a rather positive picture. Reflections on learning interactions indicated that the sessions enabled the good interaction. It was noted that students were very motivated, and when prompted they were comfortable asking questions and supported each other during group discussions, role-playing and working on case scenarios. As the course progressed, there were noticeable improvements in the quality of discussions and the way students communicated concepts and ideas during class time. Students also seemed to enjoy role-play scenarios, counselling and use of devices. Some group process issues came to the fore as a small proportion of students preferred to work individually. The quality of the learning portfolios produced by the students indicated that most had approached learning at a deep level.

Intrigued about the differences, we examined the student feedback on the newly designed course and compared it with the previous year's feedback. We found that there was a decrease in overall satisfaction with the course. It is important to note that only approximately 20% of students responded in each year and the surveys questions were focussed mainly on their feelings. Although, students were able to comment there was not enough information to come to a conclusion about the success or failure of the village pharm. Hence we sought out to obtain more feedback through online survey about student learning experiences. A common theme that emerged from this data was that students preferred traditional lectures, although one student did comment "I didn't think self directed learning would work for me but in the end it did work- it gave me more flexibility in terms of time and more time for me to learn on my own" and another commented that online material was "convenient". Students reported that they enjoyed the case-based tutorials and that from these tutorials they found that practising counselling and explaining concepts to patients was beneficial to their learning, that they "learnt something that is useful in community settings" and things they "could apply to working in a pharmacy later".

## **Discussion**

Our analysis revealed that the pharmaceuticals course in its traditional form appealed better to students. From this, many educators may be tempted to ask- why change the format? However, from a teaching perspective it was evident that students were not developing the professional skills relating to critical thinking, communication and being able to apply their knowledge in the clinical setting. As educators, we have a responsibility to reflect on the learning achieved and when this does not meet what is required, we need to consider strategies to improve student learning.

Problem based, practice based, scenario based, case based and other active approaches to instruction allow students to actively participate in learning and solving authentic real world problems in the classroom (Barrows & Tamblyn, 1980). Problem based and case based approaches to learning are particularly designed to help students develop key competencies that will serve them in their professional lives. Learning activities typically involve students identifying their learning targets, learning individually and in groups and applying their learning in solving clinical cases (Dupuis & Persky,2008). These instructional approaches empower students to be self-directed, interdependent and independent learners (Evensen & Hmelo,2000). Taking this literature into account as well as the observations by Noble et al (2011), a case-based approach where the students have to “be the pharmacist” was chosen as a way to develop the professional skills required. Applying a continuing professional development cycle approach within these scenarios of developing learning goals and working both individually and in groups also introduces them to and allows them to practise and develop the skills needed for lifelong learning.

A major challenge was to try and move the student focus from approaching learning at a surface level to one where they develop new skills by applying core knowledge to solve problems and practice being a pharmacist through role-playing. We flipped the classroom to change this focus and allow for more active learning. That way real world experiences can be simulated in the classroom, preparing students for work readiness. This approach also reflects what students will need to do when practising, where they are no longer under the guidance of the lecturer.

When changing our approach, educators will invariably find that students are uncomfortable. Their discomfort was evident from student feedback. Student concerns about learning portfolios and not knowing how to study for the exam was not surprising. It indicated that they were focussed on doing well in the course. We assumed that students completing this Pharmacy degree would have developed and adopted learning strategies as they all come to the degree after completing an undergraduate degree.

Although this may be the case, we found as Biggs & Tang (2011) identified, that students are more likely to feel comfortable in familiar situations and often change their approach to learning based on the affordances of the situation. That is, a student who usually approaches learning at a deep level may change their approach in a new situation or when they know that a surface learning approach can yield them the required outcome, they will be happy to do this. The previous design of the course was likely to encourage students to use a surface learning approach to achieve their goal. By changing the focus of the course to one where the assessment required applying knowledge and using professional skills developed during the course, this would produce discomfort as surface learning was unlikely to be a successful approach.

## Conclusion

From this experiment, we have learnt that it is important to support and guide students in adapting to these new approaches. Also, it is important to cater for different learning styles and wherever possible offer both audio-visual and printed material to support student learning needs. Developing the online material and animation videos does require an initial investment of time but, once developed, these resources would be reusable for a number of years. It is important to remember that the information supplied to students should not just be a replica of an entire face-to-face lecture recorded or written. There is a temptation as a lecturer to try and tell students everything they need to know to solve scenarios and problems. As lecturers we need to consider carefully what information needs to be provided and what students should develop on their own.

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**Please cite as:** Schneider, J., Krishnan, S., Munro, I., Birchnell, A. (2013). The Village Pharm: Flipping the classroom to enhance the learning of pharmaceuticals and associated professional skills. In H. Carter, M. Gosper and J. Hedberg (Eds.), *Electric Dreams. Proceedings ascilite 2013 Sydney*. (pp.807-811)

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