

The impact of eLearning tools on the interprofessional learning experience in a first year foundations health unit

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KEYWORDS

Interprofessional education, health sciences, elearning tools, student engagement

Abstract Foundations for Professional Health Practice 100 is a first year first semester unit that was developed for the Faculty of Health Sciences' interprofessional common first year. To investigate the effectiveness of eLearning tools to assist the students in meeting two of the unit learning outcomes a cross sectional survey was undertaken. Results of the survey demonstrated that most eLearning tools (eg. Blackboard quizzes, wiki, Elluminate *Live!*, iPortfolio, Turnitin, and vodcasts) were effective in enabling students to achieve one or more of the course learning outcomes. These results show the value of using eLearning tools in first year tertiary courses to enhance student engagement and academic progress.

Introduction

Student engagement and the development of lifelong learning skills at the tertiary level commence with the first year experience. Kift (2009) identified that first year curricula should support students as they make the transition to tertiary education and take into consideration the diverse skills and backgrounds of students as they enter university study. In addition, curriculum should be designed to engage students through active and collaborative learning and promote learning communities through active and interactive learning opportunities, peer to peer collaboration and student – teacher interaction (Kift, 2009). In 2011, these principles along with the introduction of interprofessional education were key drivers for the introduction of a common first year in the Faculty of Health Sciences at Curtin University.

Interprofessional education (IPE) enables students to learn with, from and about each other so that as future health professionals they can work together, safely and effectively to meet the needs of future clients in a variety of health care settings (Curtin University, 2011). The Faculty of Health Sciences Interprofessional Capability Framework (Curtin University, 2011) identified five capabilities (communication, team function, role clarification, conflict resolution, reflection) that, if achieved, would enable graduates to

provide safe, high quality care utilising collaborative practice, fundamental to achieving client centred service in health care. These capabilities were crucial in the development of the curriculum and learning environment for Foundations for Professional Health Practice 100 (FPHP 100), a large core unit introduced within the common first year of all undergraduate degrees offered in the Faculty of Health Sciences.

As advanced technologies are increasingly integrated into health care practices, it is vital that students experience technology integrated learning (Carbonaro, et al., 2008). eLearning technologies are becoming more affordable and more widespread in their use in tertiary study (Hosie, Schibeci & Backhaus, 2005) and can be successfully used to promote and support IPE (Luke et al., 2009; Solomon et al., 2010). In keeping with Kift's (2009) principles, eLearning tools employed in FPHP 100 were aimed at enhancing accessibility to diverse student groups and modes of study, promoting active learning and peer to peer interaction. The purpose of this eScholar grant was to incorporate and evaluate different eLearning tools to assist students to work in an interprofessional team, understand the meaning of interprofessional education and develop academic writing and presentation skills.

Background

The FPHP 100 unit was designed and developed during 2010 by an interprofessional team from across the Faculty of Health Sciences and first taught in 2011 to 2300 students (1850 in semester 1 and 450 in semester 2) with more than 30 teaching staff (including sessional) involved. The unit was delivered internally and externally at two regional campuses (Albany and Geraldton). The unit coordination team included a unit coordinator, deputy unit coordinator and a teaching support officer who provided administrative support to all staff and students in the unit. Students were taught in weekly three hour blended learning workshops of 50 students (from varied disciplines) with two interprofessional tutors per class.

The first semester cohort included students from biomedical science, nursing and midwifery, occupational therapy, pharmacy, physiotherapy, psychology, public health, social work and speech therapy, whereas students in the second semester were predominantly from the areas of nursing, midwifery and public health with smaller numbers of students from all other disciplines, maintaining the interprofessional educational context.

In recognition that professional skills development starts from year 1, FPHP 100 focused on the skills needed to work as a health professional in an interprofessional environment including the academic skills needed whilst a student, as illustrated in the following unit learning objectives. This eLearning project specifically addresses how students perceived the effectiveness of eLearning tools in achieving the unit learning objectives 1 and 2.

1. **Demonstrate academic integrity, effective information search strategies and referencing skills required for tertiary study.**
2. **Apply professional oral, written and interpersonal communication skills within an interprofessional learning environment.**
3. Compare and contrast Australian and international health systems.
4. Describe the key elements of ethical and professional standards and behaviours in health which impact on the safety and quality of client centred service / care.

Classrooms were arranged for students to work in learning groups of 4-6 students, with each learning group having access to laptops and iPads provided by the university, although students were encouraged to bring and use their own devices if available. Learning groups were established in week 1 of semester and included students from a range of different courses to facilitate and encourage interprofessional learning. These groups stayed together for the duration of the semester and worked as a team in both classroom and assessment activities. In view of the difficulties often experienced by external students attempting to work in interprofessional groups Elluminate *Live!* (as described below) was used to overcome the barriers of physical distance and multiple time zones.

During the workshops students worked individually and in their learning groups on activities designed to engage and support them to achieve the above mentioned learning objectives 1 and 2. Several eLearning tools (Blackboard, vodcasts, WIKI, Stilwell (online virtual community), Turnitin, iPortfolio and Elluminate *Live!*) were used to promote active and collaborative learning including assessment and feedback.

A Learning Management system, as highlighted by Ellaway and Masters (2008, p. 459) provides an integrated 'suite of tools and services' to staff and students in a unit.

Blackboard, the Learning Management System used at the university was deployed in a number of ways. Prior to each week's workshops all materials, including vodcasts and worksheets were available for staff and students to view and download. Under the 'Resources' tab profession specific pages were incorporated among the workshop materials to provide students with an orientation to their own and other's professions; these materials were written by various faculty staff and included links to professional websites and information about registration and roles in the health care team. Resources pertaining to assessments were made available to staff and students; these included instructions, sample assessments and feedback guides. Assessment and tutor feedback was undertaken with the use of the 'Grade Centre'. 'Discussion' boards, one for each class as well as a separate one for staff were utilised for peer to peer as well as peer to teacher communication and 'Announcements' were used for weekly updates and other communication from the Coordination team to all students.

One of the challenges of a large unit that does not have formal lectures is how to present material from experts in the field in a time efficient way that engages students in a

blended classroom environment. To meet this challenge, short (10-30 minute) vodcasts (short videoed lectures) were recorded and shown to students in class interspersed with activities that demonstrated or highlighted the practical application of what had been presented. External students were able to view the vodcasts on Blackboard. This proved to be an efficient means to achieve consistency across the internal and external groups and overcame the burden of a lecturer having to repeat a live presentation to 35 tutorial groups in a week.

A **WIKI** as described by Ellaway and Masters (2008) was created to assist students with the development of their academic writing as a 'Guide to Assignment Presentation'. A hard copy version of this resource (Portsmouth, Bathgate & Gazey, 2010) had been previously used in a core unit in the Faculty of Health Sciences to provide students with detailed instructions and examples of assignment formatting, language, structure, citing and referencing. This printed resource had the problems of being expensive and time consuming to annually update, produce and make available for all students. The printed book was also not editable between versions so correction of errors or updates could only be made annually. For these reasons an online version as a WIKI was created to allow for easy and instant editing and updating by teaching staff and to be accessible for all students regardless of location or study mode and at no cost to students. Students were unable to edit the WIKI as it was an academic reference.

Stilwell, a virtual community developed by the University of Cumbria in the UK, was available as a Blackboard site. This innovative, interactive online community featured health care critical incident videos, medical records and social histories of residents of the fictional town of Stilwell as well as a local newspaper and maps. Stilwell was used in both class activities and assessments to provide 'real life' case studies for research and discussion. Each learning group in the class was assigned one case study (e.g. heart attack) at the beginning of the semester which they worked on in class and as the basis for the major assessments. Students researched both the condition and the physical, social and emotional needs of the patient and the community, with a particular focus on the importance of interprofessional care for sustainable and successful client centred outcomes.

Turnitin was used as a teaching and learning tool to support students in developing their academic writing and referencing skills. Students were taught in class how to interpret the features of Turnitin reports and best use the feedback to build on their academic research, writing and referencing skills. Students were encouraged to submit up to two drafts of their written assignment and make changes based on feedback received prior to submitting their final copy for assessment.

An ePortfolio is an individual online repository of events, reflections and assessment (Ellaway & Masters, 2008) and Curtin University's **iPortfolio** was utilised as a tool for evaluating student development of key professional skills and as a means of giving and

receiving feedback by tutors and interprofessional peer learning groups. This tool provided an online space for students and staff to create, share and publish evidence of their learning achievements and professional development. It provided social networking features that encouraged students to seek feedback from peers on their work and achievement of learning objectives.

Illuminate *Live!*, an online virtual classroom, provided a forum where external students met weekly to engage with each other and the subject content, which included interprofessional collaborations and clarification of assessment requirements. *Illuminate Live!* provided the flexibility that permitted students from multiple locations and different time zones to join in these sessions run by the external tutor at least twice a week. The sessions were recorded enabling those who did not attend the live forums to listen / view the recordings at a time convenient to them.

Purpose, aims and objectives of the research project

Given the specific context in which FPHP 100 was (and continues to be) taught (i.e. large class, dispersed cohort, interprofessional learning), the project team sought to explore interesting ways in which the integration of multiple learning technologies could be used to leverage student learning, whilst simultaneously articulating the priorities for first year curricula. The overall aim of this research project was therefore to evaluate the impact of interprofessional education (IPE) eLearning tools on first year student experiences in a large health science unit.

Specifically, the research aimed to answer the following questions:

1. What are first year health science students' general computer skill levels before and after completion of FPHP 100?
2. Do specific eLearning tools impact on students' development of academic writing and presentation skills?
3. Do specific eLearning tools impact on students' understanding of the definition of IPE as "Occasions when two or more professions learn with, from and about each other to improve collaboration and the quality of care" (CAIPE (2002), as cited in Curtin University, 2011, p.3).
4. Do specific eLearning tools impact on the student experience of working in an IPE student team?

Methods

Study design

The study design involved a cross-sectional survey of first year health science students enrolled in the Faculty of Health Sciences for the year 2011. As the main aim of the study was to evaluate students' experiences with using a range of eLearning tools to meet the specific FPHP 100 learning outcomes, an online survey was conducted.

Online survey tools, rather than other data collection methods, were used within this study to allow for a large sample of data to be collected, and to accommodate both internal and external students. Data was collected at the end of each semester (i. e., June and October 2011), and access to the online surveys was gained from a link posted on the FPHP unit in Blackboard. Both internal and external students had full access to the FPHP 100 Blackboard site and survey links.

Sample

Students (n=384) from 19 schools/discipline areas throughout the Faculty of Health Sciences participated in the study.

Current enrolment in the FPHP 100 unit was the only inclusion criteria for participation in the study. As participants accessed the surveys via the FPHP 100 Blackboard site this ensured that access was limited to current and enrolled students. No students were excluded from participating in the study.

Participation in the study was voluntary and anonymous. Students were requested to participate in the study via 'in-class' announcements made by tutors, and via a general email sent to FPHP 100 students by the unit coordinator. Information given to students included where to access the surveys and survey access (open/closing) dates. Survey completion occurred outside of class time, at a time convenient to students.

Student enrolment (both internal and external) in the unit numbered 1850 students in semester 1 and 450 students in semester 2. The overall participation rate for the study was low (19.5%). It is likely that conducting the study at the end of semester when students were preoccupied with exam preparation and likely to have encountered other requests for participating in surveys (e.g. general first year experience survey and eVALUate) contributed to the low response rate.

Survey procedures

The surveys were developed and piloted with a small group of students (n=5) prior to the survey link being posted on the FPHP 100 Blackboard site. Tutors were instructed to demonstrate to students in class the location of the survey link and how to access the survey via Blackboard. For external students the tutor demonstrated access and procedures via Elluminate *Live!* and email.

There were two surveys used in the study. The main survey was completed by all participants. As only external students in semester 2, 2011 (n=28) used the eLearning tool, Elluminate *Live!*, these students were asked to complete an additional separate survey following semester 2. The surveys were available for a two week period to allow for as many students as possible to complete it. Timing of the survey completion indicated that most students would be able to complete the surveys within a 20 minute time period. Students were able to complete the surveys from any place they could access

their Curtin OASIS account and the unit's learning management system. Information regarding the surveys and instructions for the completion of the surveys were written at the commencement of each online survey. This information allowed for informed consent.

Survey tool

The survey tools used within this study were developed using Survey Monkey. The online surveys were structured into three sections.

Section 1: Demographics

Section 2: Computer use / experience

Section 3: Students rating of eLearning tools to meet the course outcomes.

Section 1 contained four questions pertaining to age, gender, school enrolled in and mode of study.

In Section 2, computer skills and experience were measured using confidence scales based on an analogue scale of 1 – 10, with 1 indicating 'not confident', 5/6 – 'reasonably confident' and 10 – 'totally confident.' This section contained 10 questions to assess computer skills / experience both prior to commencing and on completion of participating in the FPHP 100 unit. Questions included computer skills / experience using computers for the following types of programs; Word, PowerPoint, searching library sources, email, internet, Blackboard, and WIKIs.

In Section 3, the extent to which particular eLearning tools facilitated achievement of specific learning outcomes and or the study aims was investigated. The measurement scale comprised of categorical agreement ratings, namely 'strongly agree', 'agree', 'neither agree/disagree', 'disagree', 'strongly disagree' and 'not applicable.'

Data analysis

Descriptive statistics (%) were used to describe the sample and to examine the relationships between variables. Chi squared (χ^2) analyses were also used to examine the relationships.

All results are reported using up to three decimal places depending on the statistical methods used, with alpha probabilities also reported to three decimal places. A criterion alpha of .05 was used throughout the results.

Ethical considerations

This study was approved by the Curtin University of Technology Human Research Ethics committee.

The online survey contained an introduction section explaining the aims of the study and that participation was voluntary and information collected would remain confidential.

There was no identifying information collected. Those not wishing to continue with the survey could exit the survey at any time. Completion and submission of the online survey by the students was taken as consent to participate.

Data storage

Survey results are stored in a secure location at Curtin University. All data collected for this study are the property of Curtin University and will be stored in a confidential and secure location for a minimum five years as specified by the National Health and Medical Research Centre (NH&MRC) guidelines. Stored data will only be accessible to the researchers.

Findings

The results of this study are presented below under the headings of Demographics, Computer Skills and eLearning tools.

Demographics

A total of 384 students participated in the main survey, 342 in Semester 1 (or 18.5% of semester 1 internal enrolments) and 42 (or 9.3% of semester 2 internal enrolments) in Semester 2. An additional 28 (or 24% of semester 2 external enrolments) external students completed the separate survey on the use of Elluminate *Live!* in Semester 2. Results from this Elluminate *Live!* survey are documented under Elluminate *Live!* below in Table 3 and indicated by **.

Age:

The majority of participants were aged < 20 years. Table 1 shows the main survey participants' age by category.

Table 1: Demographics of students by age

Age category	% of participants
Under 20 years	64.5
20-25 years	16.4
26-35 years	10.7
Over 35 years	8.4

Gender:

83% of participants were female, and 17% male.

Schools:

Participants were from a range of schools within the Faculty of Health Sciences as shown in Table 2.

Table 2: Enrolment of FPHP 100 students by school

Faculty of Health Science Schools	% of participants
Biomedical Science	7.9
Nursing / Midwifery	19.3
Occupational therapy / Social work	16.8
Pharmacy	10.9
Psychology / Speech therapy	15.3
Public Health	20.2
Physiotherapy	9.4

Computer skills

Nearly all participants (99.1%) reported the ability to use computers for generic tasks such as using Microsoft Word and email prior to their commencement of FPHP 100. Participants were however, less likely to have technical skills in using the specific learning technologies integrated in FPHP 100, namely Elluminate *Live!*, Blackboard, iPortfolio and WIKIs. Table 3 presents the reported before and after computer skills of FPHP 100 students.

Table 3: eLearning tools before and after participation in FPHP 100

eLearning tools	Participants' self-assessment of their computer skills before commencing FPHP 100 (%)	Participants' self-assessment of their computer skills following completion of FPHP 100 (%)
Blackboard	82.6	99.1
iPortfolio	38.8	98.3
WIKI	46.4	87.8
**Elluminate <i>Live!</i>	17.4	70

eLearning tools

Participants reported the usefulness of the range of eLearning tools in meeting the FPHP 100 Unit learning outcomes. The results demonstrate that different eLearning tools were reported to be useful in achieving different learning outcomes. This supports the use of a range of eLearning tools in a large unit with multiple learning outcomes. Table 4 demonstrates that the use of the WIKI and Turnitin had the most impact on meeting the learning outcome of developing academic writing skills.

In developing skills to meet course requirements of developing an understanding, and experiencing IPE, the eLearning tools reported to have the most impact included the use of the online community **Stillwell** and the **iPortfolio** task of working online within a collaborative network.

Table 4: Percentage agreement on eLearning tools that facilitated achievement of FPHP 100 unit learning outcomes

FPHP 100 learning outcomes	% of respondents		
	Agree	Neither agree / disagree	Disagree
N = 384			
Developing academic writing and presentation skills			
Using Blackboard for a referencing quiz	62.9	22.0	15.1
Viewing vodcasts	36.9	33.1	29.9
Using a WIKI for assignment presentation guidelines	70.3	18.2	11.5
Viewing Stilwell case studies and use in assessments	47.8	26.7	25.5
Using Turnitin (to build effective research writing, citation and referencing skills??) for assignment writing	80.5	12.2	8.4
Completing the iPortfolio "About Me page" – link to study aims not clear??	57.1	22.9	20.1
Inviting an iPortfolio collaborative network – as above	47.6	22.2	27.9
To understand the meaning of interprofessional education, as defined by CAIPE (2011)			
Using Blackboard for a referencing quiz	40.2	30.4	29.7
Viewing vodcasts	43.9	31.6	24.5
Using a WIKI for assignment presentation guidelines	43.5	30.4	26.1
Viewing Stilwell case studies	65.7	21.4	12.9
Using Turnitin for assignment writing	48.7	27.7	23.6
Completing the iPortfolio "About Me page"	52.2	26.1	21.7
Inviting an iPortfolio collaborative network	60.3	22.4	17.4
Working within a student interprofessional team			
Using Blackboard for a referencing quiz	46.8	26.7	26.4
Viewing vodcasts	42.7	30.7	28.8
Using a WIKI for assignment presentation guidelines	50.2	25.1	24.7
Viewing Stilwell case studies	69.0	19.4	11.7
Using Turnitin for assignment writing	55.6	22.1	22.3
Completing the iPortfolio "About Me page"	53.6	23.7	22.5
Inviting an iPortfolio collaborative network	58.3	21.1	20.5

Illuminate Live!

Of those external students in semester 2 (n=28) reporting use of this eLearning tool 82% were female and 18% male. 21% of these students attended > than 5 sessions (out of 9) throughout the semester and 74% more greater than 3 sessions. 87% of students reported that attendance at *Illuminate Live!* sessions was helpful to understand the unit's assessment requirements, and 82% reported that the sessions were helpful to understand

the course materials. Anecdotal feedback via Curtin University's eVALUate survey conducted at the end of Semester 2, 2011, included comments such as:

'As an external student Elluminate Live! was extremely helpful';

'A great tool to give access to a tutor';

'I was unable to attend the Elluminate Live! sessions, however listened to the recordings which was very helpful'; and

'A great way to hear how other students are getting on with their work'.

Discussion

The majority of students who completed the survey were female, with almost two thirds being recent school leavers, aged less than 20 years. Most students were enrolled in the Schools of Public Health and Nursing and Midwifery. These schools have large first semester intakes and a significant second semester intake, which likely contributed to the large enrolment into FPHP 100 in semester 1, 2011.

Development of eLearning computer skills

Upon entry into FPHP 100, the study participants' self-assessment of their computer skills varied considerably for the four tools used, with Blackboard identified most favourably followed by WIKI, iPortfolio and Elluminate *Live!*. It can be expected that commencing students' skills in using the latter two of the eLearning tools might be limited due to not having used them previously. However, on completion of the FPHP 100 semester, students indicated significant improvement in their capabilities to use these tools. As these computer skills will be applied in progressive units, the development of these skills within the course is imperative for future academic success.

Developing academic writing and presentation skills

The use of **Blackboard** for activities such as electronic quizzes, viewing resources such as discipline specific sites, accessing library information and the online STILWELL community, impacted on students' ability to meet the unit's learning outcomes pertinent to the development of academic skills. Additionally, there were significant associations between participant's age and use of Blackboard for these activities. For example, older students were more likely to report that Blackboard activities (Stilwell ($\chi^2(2)=6.29$, $p=.043$) and discipline specific pages ($\chi^2(2)=9.85$, $p=.007$) were effective in developing academic integrity skills and an understanding of IPE.

The use of a **WIKI** for assignment presentation guidelines and **Turnitin** were reported to have the highest impact on meeting academic skills learning outcomes in FPHP 100. Of those who responded, 70.3% agreed that the use of a WIKI and 80.5% agreed that Turnitin positively impacted on their ability to meet academic skills learning outcomes.

These two eLearning tools were used to teach the academic skills of paraphrasing, citation and referencing; vital for academic success at the tertiary level by providing reference material (WIKI) and providing feedback on earlier drafts (Turnitin).

Understanding the meaning of interprofessional education and working in an interprofessional team

Interprofessional education and practice were new concepts to students entering this unit however from week one the relevance of interprofessional education as defined by CAIPE, and cited by Curtin University (2011) for the provision of safe and high quality client centred care was demonstrated through the interprofessional composition of the class, the teaching staff and learning activities using specific eLearning tools.

The use of the **iPortfolio** for formative assessment in the form of self, peer and tutor feedback throughout the unit provided opportunities for students to engage by receiving and providing feedback. This also assisted in providing critical feedback for first year students' learning experience (Kift, 2009). Unit requirements of self reflective practice to meet the iPortfolio assessment requirements again demonstrated students' ability to engage with the curriculum. Additionally, inviting the collaborative iPortfolio network enhanced the student's learning community, with students reporting that iPortfolio assisted in developing the required graduate attributes and experience of working within an interprofessional team. The opportunities demonstrated in this case study supported the continued use of iPortfolios in FPHP 100 into Semester 2, 2011, although some modifications were made to the frequency of use and number of assessments uploaded to the iPortfolio due to technical difficulties experienced with the technology in semester 1.

The **STILWELL** case studies were effective in showcasing how different health professionals work together to benefit patients/clients using a range of common 'real-life' scenarios. A number of perspectives were presented both from the health professionals, the patients and the community which demonstrated the complexity of health care and helped students to define their as well as others' roles in the health care team. This multimedia approach engaged students with over two thirds of respondents confirming it helped their understanding of interprofessional education and working in an interprofessional team.

Students felt the use of **vodcasts** either in class or online though Blackboard did not help to develop their academic skills or their understanding of interprofessional education or working in an interprofessional team. As the vodcasts were primarily information giving they did not support active and interactive learning opportunities or peer to peer /teacher interaction (Kift, 2009), which is vital for student engagement.

Conclusion

Technology is an increasing tool in everyday life, with eLearning technologies now being an integral part of tertiary studies. Furthermore, with universities developing large common first year programs with student enrolments >1800 students per semester; the use of technology and eLearning strategies are important to assist in managing the quality of these programs. As recent literature emphasizes the importance of engaging students in their first year to assist with future academic success, it is therefore critical that these large first year units utilise effective eLearning strategies for student engagement and hence, their academic progression.

The aim of this study was therefore to firstly investigate student's eLearning skills, and secondly, the effectiveness of a range of eLearning tools in assisting students to meet course specific learning outcomes. Results from surveying the students demonstrated that on completion of the FPHP 100 course, students rated themselves with having enhanced computing / eLearning skills. Additionally, the use of a range of eLearning tools within the context of this large first year unit, was reported to be effective in assisting students to meet the learning outcomes of the unit, thus academically progressing students through their course.

Results from the study also highlighted the importance of using a range of eLearning tools as students reported the usefulness of different eLearning tools to meet different learning outcomes. For example, understanding the meaning of interprofessional education, and working within an interprofessional student team, was achieved by utilising innovative eLearning strategies such as iPortfolio.

In light of these results, strengthening the use of these eLearning tools within the FPHP 100 unit is recommended, for example for development of the use of tools such as Turnitin and the WIKI to further enhance academic integrity skill attainment.

In addition to the strengthening of the use of these eLearning tools, with future development of the FPHP 100 unit, embracing new eLearning technologies (such as the use of iPads) to further support the unit's teaching and learning strategies would be encouraged.

Postscript

Results from this study were presented by the authors at the 3rd Biennial Interprofessional Education Conference 'Collaboration Across Borders' (CAB III) in Tucson, Arizona in November 2011.

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