Introducing Learning Design and LAMS to Pre-service teachers: When is the best time to do this?

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Abstract: Pre-service education students are exposed to a variety of technology while studying at university. This generally occurs as part of the course they study, while on practicum and informally, both at home and socially. This paper focuses on the experiences of students studying an educational technology course at one Australian university in Sydney and using data from two different studies and presents a case for determining the best time that pre-service education students are exposed to learning design and the Learning Activity Management System (LAMS). The data suggests that students may be more able to integrate skills learnt with content knowledge in later years at university.

Introduction

When is the best or most appropriate time to introduce LAMS to pre-service education students?
In what ways can LAMS be used effectively in pre-service education students?
Do students think they can use LAMS effectively once they are teaching in classrooms?

These questions have been asked at one university as anecdotal evidence from that university suggests students are not always getting the most from learning these applications while at university. Either the students are not able to apply and use the applications they have learnt or they are not using them while in schools completing their practice teaching. This suggests that once students graduate they will continue to not use these applications both for lesson preparation and as learning tools in the classroom. The aim of this research is to investigate the optimum time of teaching ICT applications to undergraduate pre-service students with a view to having greater usage once students have become teachers.

Background

In the Australian state of New South Wales (NSW), there is a perceived need to teach pre-service teachers various applications that will assist them in the teaching of, and integration of technology when teaching in classrooms in the future. The teaching of these applications is very important as they are being used in schools with students. Both the New South Wales Department of Education and Training and the Catholic Education Office in Sydney are using the Learning Activity Management System (LAMS) and other similar applications in schools.

At The University of Notre Dame Australia, students complete a great deal of practice teaching which is supervised classroom teaching. This is spread throughout the course. They have one week in a school in their first year of study and ten weeks in both second and third years. The students then complete a ten week internship in their final year of the course. This amount of practicum gives the student a unique experience as many universities have a lot less and it means that students are generally very comfortable in the classroom when they graduate.

In NSW the Department of Education and Training have introduced the NSW Quality Teaching Framework (NSW Department of Education and Training, 2004). This is the focus of the LAMS sequence the students will be completing and it is also a focus in the pre-service teacher education course the students complete. Quality Teaching has a strong foundation in research (Newmann, Marks, & Gamoran, 1996;

Newmann, Secada, & Wehlage, 1995). The framework consists of three dimensions (Intellectual quality, Quality learning environment, and Significance), each comprising six elements of pedagogies.

The Quality Teaching Framework's dimension of intellectual quality with the importance of this dimension shown in research data. Students within classrooms that have a high level of intellectual quality achieve improved student outcomes (Newmann, et al., 1996). Indeed, Amosa et al. (2007) indicates that high levels of intellectual quality can significantly close the gap between students of high and low socio-economic status. More fundamentally, the inherent importance of this dimension lies in the fact that it focuses teachers and students on the processes and outcomes of learning. 'Traditional Pedagogies' that proceeded quality teaching and authentic pedagogies seemed generally didactic, treating knowledge as a body of facts to be learnt rather than discovered.

The dimension of intellectual quality encourages teachers to understand deeply their subject areas and to demand that students reflect this depth through analysis and interpretation of information presented. The dimension of intellectual quality insists that students weigh up conflicting points of view and wrestle with the ambiguous nature of knowledge. Students become acquainted with the metalanguage specific to various disciplines of study as well as learning that understanding comes through sustained and elaborate 'conversations' with others and with oneself through a process of reflection. Without a high level of intellectual quality within lessons, students avoid having to understand the complexities and inferences of a subject area and instead focus on memorizing the content presented so that it can be recalled on assessment tasks exactly the same way it was read or heard. Thus it is important that teachers understand this dimension. It is hoped that graduates from all New South Wales universities will have these skills.

The Learning Activity Management System (LAMS) was introduced to four different cohorts of students. These students were in both 2nd and 4th years at university with two cohorts being introduced to LAMS in Semester 2, 2009 and two in Semester 1, 2010. LAMS is an open source learning design system for designing, managing and delivering online collaborative learning activities. It provides teachers with an intuitive visual authoring environment for creating sequences of learning activities. These activities can include a range of individual tasks, small group work and whole class activities based on both content and collaboration. Although the students complete another technology unit in first year LAMS was not introduced during that time and thus no data was collected from that particular cohort.

Literature Review

Much has been written about pre-service teachers learning ICT skills. Earlier research suggests that teachers don't like change and that ICT is perceived as a catalyst for change as well as ensuring that there is a change in teaching styles, ways of accessing information and a change in approaches to learning (Watson, 2001). This is possibly still true today.

Research has indicated that pre-service beliefs and perceptions can play a crucial role in how they teach when in schools in the future (Wang, 2002). Thus, it is important to expose pre-service teachers to positive experiences in technology. This is also because teachers are change agents in schools and they play a heavy role with ICT integration in schools (Tao, 2008)

The practicum has an acknowledged central place in teacher education programs (Ryan, Toohey & Hughes, 1996). Practicum provides an opportunity for pre-service teachers to:

- apply knowledge and skills in a practical setting;
- progressively develop competencies through participation in a range of practical experiences;
- test their commitment to a career;
- gain insight into professional practice; and
- evaluate their progress and identify areas where further personal and professional development is needed (Daresh, 1990).

The opportunity for pre-service teachers to reflect on their experiences in light of their current knowledge and understanding is crucial to an effective practicum experience (Boud, Keogh and Walker, 1985). They need the time and space to make connections between the theory they have studied and the experiences they have had in practice, and mobile technologies can create these opportunities (Herrington, Herrington & Mantei, 2009). By providing a means of immediate communication (this could be a phone call, texting, an email message or a forum post) the pre-service teachers can ask questions, collaborate with others, seek out new knowledge and plan new activity (Sharples, 2005). In this way, they can actively share their experience, learn about those of their peers, discuss differences and establish shared meaning. This type of collaborative consultation improves problem solving skills, facilitates understanding and promotes academic achievement (Meyers, 1995).

Methodology

The data collected for this paper was taken from two different research studies conducted by the authors. One was in Semester 2, 2009 with the other in Semester 1, 2010. The two studies allowed for a wealth of data to be collected through the use of online questionnaires which focused on different areas of research and now provide evidence to support the overarching question for this paper. This question is:
When would students benefit from using lesson planners such as LAMS?

In Semester 2, 2009, one study was conducted with two small groups of 2nd and 4th year students. This study focused on the exploration of the learning design process through the use of LAMS as a scaffold for lesson planning with each group through the use of an authentic activity. Both of these groups contained a small number of students with one group having the 2nd year group having 22 in the group and the 4th year group containing 14 students (see Table 1).

Year Level	Course Code	2009 (n)	2010 (n)
2nd year	ED2203	22	
4th year	ED4710	14	
2nd year	ED4134		74
4th year	ED4134		20

Table 1: Student numbers in each cohort

These groups were introduced to LAMS in a workshop with the students going through a LAMS sequence prior to learning how to create their own. The LAMS sequence they experienced contained a range of activities and was on Quality Teaching as shown in Figure 1.

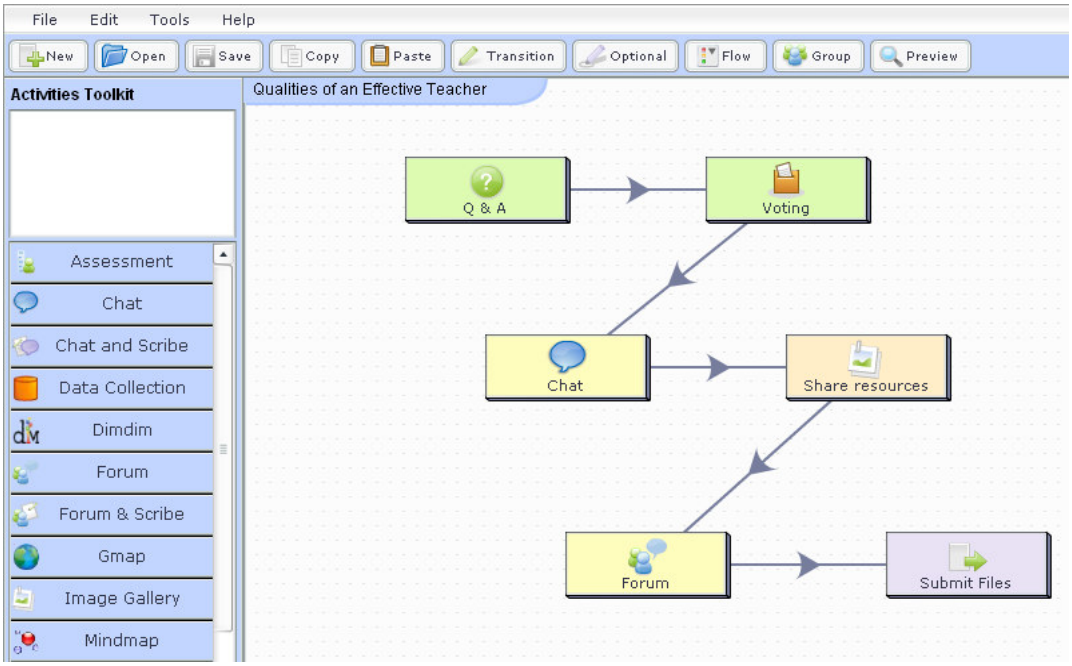

Figure 1: Qualities of an Effective Teacher Sequence in LAMS

In Semester 1 2010, a study once again focused on two groups of 2nd and 4th year students (see Table 1). The students in this study were from different cohorts. This study focused on learning design and the students were introduced to LAMS in a 1.5 hour workshop class. Although there were only 20 students who participated in the research in the 4th year group, the 2nd year group contained 74 students. However, many of

these students skipped questions when answering them. These students also completed a LAMS sequence with a range of activities. The LAMS sequence introduced was on also on quality teaching (see Figure 1).

After completing the LAMS workshop which included a hands-on activity and after completing the ethics permission forms the students were asked to participate in an online questionnaire. This questionnaire varied depending on the study the students were participating in. However, the questionnaire asked a variety of questions including numerous ones on lesson planning, learning design as well as teaching experiences while on practicum. It is important to note that the questionnaire was the same for each of the two studies and as much as possible they were delivered in similar conditions.

Results and Discussion

Overall, student answers to various questions were different depending what year and cohort they were in with their pre-service education.

The results have been placed into two categories. These are 'lesson planning' and 'quality learning and teaching'. The results are described in detail below.

Lesson Planning

The 2009, second and fourth year students were asked if they think that creating written lesson plans is an important aspect of learning to be a teacher. Interestingly, 21 students in second year said yes (95%) while one said no. Further, out of the 14 the fourth year students who completed the questionnaire nine (64%) said yes, four said no (28%) and one (7%) student said yes and no. This shows that students in second year value creating written lesson plans whereas students in the fourth year cohort do less so.

Students were also asked whether from their experience during practicum if written lesson plans help with the lesson going according to plan. Again there was a discrepancy between the second and fourth year students. Nineteen second year students answered this question, with 16 checking yes (84%) a written lesson plan helps with the lesson going according to plan and three (16%) checking no. In the fourth year group seven checked yes, six checked no and one commented "sometimes". This suggests that students in fourth year have a greater understanding that a lesson may deviate from its original plan due to a number of reasons. Fourth year students show greater insight into teaching as suggested by one student who commented "I wrote good lesson plans, but I ended up adding many great things that I didn't write down" while another wrote "sticking to lesson plans is important but impromptu learning always happens when students raise valid issues/questions". This is suggesting that students have gained a greater understanding of teaching in the classroom. This is in all probability due to increased student knowledge of teaching and which is in part due to the amount of practical experience the students have had in the classroom by fourth year.

In the 2009 group, students in both second and fourth year were introduced to LAMS and completed an assignment that focused on creating a lesson sequence using LAMS. The students were taught about the feature in LAMS Version 2 that has the facility to record online and offline tasks, which means it could be used as a lesson plan creator. Eleven (69%) second year students from the 16 who answered the question felt that they would not use the LAMS lesson creator and they would still use a regular paper lesson plan while four (25%) stated they would use it. One student did not know. Student comments include "I still enjoy writing my lessons" and "I would probably do a written lesson plan as it to me [sic] is easier".

In the fourth year group three students did not answer the question but eight (89%) felt they would use the LAMS lesson plan creator while one student did not know. Student comments include that "it gives an overall view of the lesson", "it is fast, interesting and helps with my understanding of ICT" and "it seems a lot more practical". These results suggest that students in fourth year have moved past creating traditional lesson plans and are ready to use another type of lesson plan creator when there is a need.

This evidence suggests that students in their fourth year would benefit from creating lesson plans using LAMS. However, second year students still find writing traditional lesson plans beneficial to them. Perhaps this is because their skills in both teaching and lesson planning are not as developed.

Quality Learning and Teaching

Students in 2010 completed a 1.5 hour class on LAMS as part of a compulsory unit for their second ICT unit. Due to a course restructure this unit was taught to both 2nd and 4th year students. At the end of this class the students completed a questionnaire with regards to learning design. Students were also asked about quality learning and teaching.

Students were asked what factors they think promotes quality learning and teaching; with students in fourth year able to answer this while students in second year provided less in-depth answers. Students in second year also tended to skip the question with 32 skipping the question and 42 answering it. Only 2 students in fourth year skipped the question while 18 answered it. This is despite that the students were taught as much as humanly possible in the same conditions. For example, the class was the same, there were no particular time constraints and the same expectations were placed on the students.

Students were asked what provision or support did the practicum school provide to promote quality teaching and learning. Students in fourth year who have completed substantial practicum were able to answer this in an in-depth way. Although students in second year gave various answers it appears that they had little knowledge of the quality teaching framework used in NSW schools.

This suggests it is better to implement these types of ICT web applications after students have completed at least one long practicum although they may have a better understanding of quality teaching in later years. For example, in their fourth year as students from The University of Notre Dame Australia will have completed 20 weeks of practicum by the beginning of fourth year, which is a substantial amount and means they should have a good understanding of the quality teaching principals.

Conclusions

The evidence presented here suggests it is important to teach ICT applications such as LAMS later in a pre-service education course than earlier. This is because of the great conceptualisation of teaching concepts that students have gained through attending the course. It may also be because of greater content knowledge and being able to adopt skills with the content knowledge and put into practice during the later part of the pre-service education course.

Although data collected is limited, it certainly is strong enough to suggest that further studies in this area would be beneficial. Future studies can be widened to more applications than just LAMS, for instance, learning objects and other Web 2.0 applications and mobile learning. It might also be beneficial to investigate when compulsory ICT units are taught to pre-service education students as many are taught in first or second year, prior to when students have completed any substantial practicum's in schools. This research suggests that instead of, or perhaps as well as, classes should be conducted in using ICT when nearing the end of the degree. This may allow for a greater understanding of theoretical ICT concepts to be understood and a great uptake of ICT usage while teaching in schools.

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