

Chapter 11. Learning to Evaluate – Evaluating to Learn

Participant: Judith Lyons¹

Mentor: John Milton²

RMIT University

Abstract

This paper reports on the planning and implementation of an evaluation of the final prototype of a physical and computer-based simulation in a postgraduate midwifery program. The evaluation framework was designed to reflect the pedagogy of Laurillard's conversational framework, which had been used to structure the learning experiences in the simulation. Data collection methods and analysis highlighted the themes of discussion, interaction, reflection and adaptation of student learning actions as well as intrinsic feedback – all central to the conversational framework of teaching and learning process.

The evaluation was a component of a major ASCILITE staff development project to share and document lessons learned about evaluation (funded by the Committee of University Teaching and Staff Development). In this case an action learning approach involving an external mentor was used to reflect on the processes of evaluation.

The evaluation planning and implementation is described in the following paper including the relationship to the conversational framework, the findings on the student-learning environment and the student-learning processes and outcomes. We elaborate the lessons we have learned about evaluation.

1. Introduction: The context of the evaluation project

We report here an evaluation of a computer facilitated teaching development used in postgraduate midwifery education program at RMIT. The Pregnancy Simulator Learning Package (PSLP) is a complex computer and physical simulation that was initially funded and completed to prototype stage through CUTSD support. The Nurses Board of Victoria supported the evaluation during design and development phases of the project.

The PSLP project comprises a computer and a physical simulation of a pregnancy at term with fetus located in an abdomen. The multimedia tutorial simulation - physical pregnancy simulation with computer based learning scenarios is presented as exemplar and revision case scenarios. The learning experience is designed as a dynamic combination of the experience of the physical act of palpation (psychomotor skills), interpretive process of conceptualising, visualising and clinical decision-making, (cognitive). See Figure 11.1. Further description of PSLP is provided in Lyons, Miller & Milton (1998) and Lyons and Milton (1999).

PSLP was designed to teach students pregnancy assessment and palpation skills that are covered in two courses (subjects) in the postgraduate midwifery program. The case-based learning experience guides the students through healthy and at-risk pregnancies and onset of labour over two semesters. The PSLP use is integrated into coursework and is undertaken simultaneously with lectures, tutorial, and clinical practice. The PSLP helps provide a foundation level of skills in pregnancy assessment and palpation at various points in the program.

¹ Midwifery Programs Coordinator, Department of Nursing and Midwifery, Faculty of Life Sciences, RMIT University

² Learning Technology Services, RMIT University



Figure 11.1. Pregnancy Simulator Learning Package (PSLP).

In second semester the PSLP was embedded in an intensive set of learning experiences, including extensive use of online resources, online discussions and a major online role-play. Previous experience with students in this subject and course has revealed that they require time to adapt to using computer technology. There are issues of fear, trepidation, and a lack of basic computer skills to be addressed.

The educational package forms the key feature of PSLP and is explicitly designed on the basis of Diana Laurillard's conversational framework (Laurillard, 1993). Interaction between the teacher, student and content reflects the interdependent relationship between all dimensions of the learning teaching experience.

Essentially the teaching learning process is a dialogue between the teacher and the student and student-to-student dialogue (Milton, 1997). Dialogue is structured to introduce key concepts and associated skills of pregnancy assessment in a hierarchical manner that provides the central element in this learning package. Learning sequence gives effect to - discursive, adaptive, interactive, and reflective dialogue.

2. Evaluation Paradigm

The evaluation approach was based on an epistemology of constructionism and an interpretivist theoretical perspective³ (Crotty,

1998). Under the interpretivist perspective students interpretations or how they make sense of the world of the simulation, and the whole learning experience more generally, is the central reference point. So, for example, we do not seek direct cause and effect relations between the external (to the student) world and their actions. Rather, we seek student perceptions with which their actions may be associated.

The former would require us to draw conclusions about student actions based on an (objective) knowable 'real world'. Evaluation data would include actions taken by students. Evaluation analysis would directly hypothesise reasons for those actions linked to observed features of the environment.

The latter imply that the student perceptions and the relation of those perceptions and the student actions become critical. Evaluation data are centrally student perceptions, which are seen by the evaluator to be uncertain and 'fluid'. Evaluation analysis focuses on how the student perceptions 'invite' certain actions in the learning environment.

This evaluation paradigm is consistent with the conversational framework and with the underpinning perspectives on learning (based in part on concepts associated with the phenomenographic research method).

In practice with the PSLP, this means we are fundamentally interested in how the student interprets, and then acts on, instructions and the information in the context of the total learning package (the case data provided to the student and the access to the physical simulation). We see these interpretations and actions as intrinsically related. Only by closely attending to this relationship can we come close to identifying what misinterpretations may be being made by students and what modifications may be called for in the package. Our aim is always to craft the total learning package so the students can experience learning in a manner as generally envisaged in the conversational framework.

³ We point out here that Crotty's use of the term constructionism, with its focus on 'the collective generation [and transmission] of meaning', contrasts with constructivism which focuses

exclusively on 'the meaning-making activity of the individual mind' (p58).

3. The Aims of the Evaluation

The project evaluated the prototype in a learning situation with 24 students leading to improvement of the learning experience for students. While there were expected to be minor interface issues the primary aim was to ensure the text instructions, questions and feedback were together effective in enhancing student learning.

The evaluation focussed on learning outcomes and how these were influenced by the students' experiences of the simulation and their approaches to learning and the nature of the learning/ teaching dialogue. The data collection and analysis focussed on the four key themes of the conversational framework – discursive, adaptive, interactive and reflective dialogue as well as the central concept of intrinsic feedback.

We wanted to ascertain students' prior knowledge, evidence of how they learned from the experience and descriptions of what they did. In addition, we needed their interpretations of questions and feedback provided by PSLP and how these interpretations may have influenced their learning actions.

4. Action Research Context

To help us contribute to the ASCILITE project we needed to adopt a wider reflective framework to guide our overall approach to the evaluation. We chose an enhanced action research approach. According to Holter and Schwartz-Barcott (1993) and Sturt (1999), the enhancement action research approach begins by working in a mutually collaborative way (in this case mentor and mentee) but takes in the process further to engage in critical dialogue to raise the collective consciousness about the phenomenon - in this instance the evaluation of computer facilitated learning. This approach places evaluation as an integral part of effective teaching and learning and prompts practitioners to critically reflect on their practice.

The complete action research cycle undertaken by us included:

1. *Identification of the task to be undertaken:*
Our focus for this project was to design and

implement an evaluation plan. The emphasis was to evaluate if the learning experiences we have designed for students in PSLP are effective. We critically reflected on the key ideas that needed to be communicated to students, and spent time discussing our own paradigm, clarifying our own positions and explicitly examining the assumptions underlying our evaluation approach. Our interest was with qualitative descriptions of students' interpretations and actions. This qualitative approach of evaluation conducted in this naturalistic way also provides data with richness and better understanding of student learning that is facilitated by computers (Guba, 1989; Patton, 1990)(Guba and Lincoln, 1989 and Patton, 1990).

2. *Planning the action* included development of evaluation plan. In keeping with Ehrmann's (1997) suggestion special importance was placed on carefully designing the questions we asked. Much time was spent in planning and designing these questions (Attachment A). The evaluation study was located as development and implementation phase of evaluation. Whilst the Alexander and Hedberg (1994) and Bain (1999) learning-centred framework presented in the handbook associated with the larger ASCILITE project was considered, more emphasis in our project was placed on both the formative and summative evaluation of the learning process instead of concentrating on the formative monitoring of the learning environment.
3. *Carrying out the plan* included data collection through observations, interviews of students, drawing on students' learning notes and input into the computer and reflective diaries of investigators.
4. *Evaluation of the results* involved data analysis to uncover the approaches to learning used by students including relationships between learning outcomes, students' approaches to learning and students' experiences of the package (including students' interpretations of questions and feedback). This part of the evaluation explicitly relates to the educational perspective underpinning the simulation - Diana Laurillard's conversational framework. The data was

transcribed, collated and the patterns of issues raised by students were identified. The key themes elicited from the data were coded, categorised and analysed by NUDIST to form the issues and the phenomena to be reported.

5. *Identification and dissemination of central findings:* The initial findings were reported at the ASCILITE project workshop. Final reporting, apart from this paper, will include conference presentations and publishing in nursing and higher education refereed publications.

5. How we Planned our Evaluation

The evaluation encompassed the complex and dynamic teaching and learning context course content and the learning environment created through the PSLP simulation, see Figure 11.2 below.

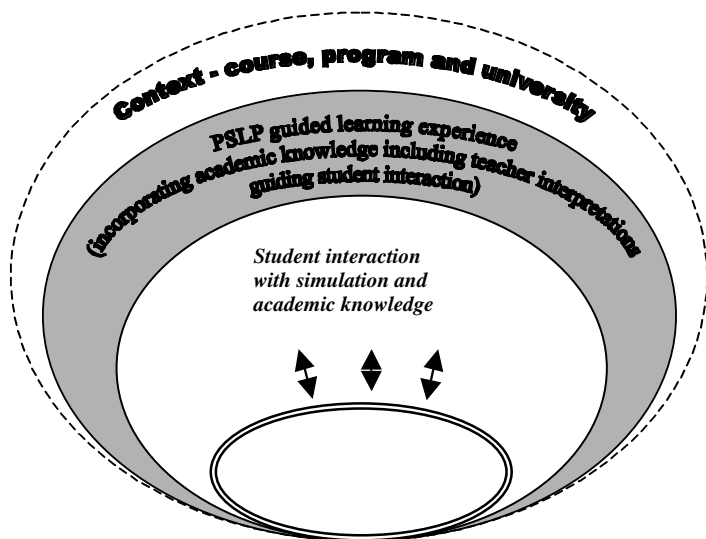


Figure 11.2. The territory of the evaluation.

The key factors, which shaped the evaluation in this project, were:

1. PSLP had been developed to prototype stage and was to be used for student learning in two midwifery courses. There were therefore both formative and summative purposes to the evaluation.
2. The basic form of the learning experience depends on carefully targeted, computer-led interaction with students. Therefore the instructions and feedback to students had to be carefully crafted to ensure students interpreted in the intended manner thereby helping them to learn.
3. The planned interactions with students had to be guided by specific ideas drawn from educational theory – in this case particularly Diana Laurillard’s notion of intrinsic feedback as well as the dimensions of teacher-led conversations and student tasks (refer Figure 11.3).
4. The focus on uncovering and directly addressing student misconceptions meant we had to uncover the approaches the students used (aims and strategies) as well as how they interpreted questions, statements as well as their engagement in the case study including the palpation.
5. Only one pair of students at a time could undertake the package. This was both a limiting factor and an opportunity to use evaluation to make improvement more iteratively (though it does raise ethical issues). This way of evaluating suited the strong focus on student interpretation of instructions and teacher feedback (2 above).
6. The package was to be evaluated over two semesters with one ‘learning cycle’ being the focus in first semester. What we learned then influenced the evaluation approach in second semester when we looked at the remaining (palpation) cycles.
7. The evaluation had to use multiple data sources to help uncover different aspects of the students’ experiences.

In addition, the adoption of an action learning approach necessitated:

- mutual collaboration and continual critical dialogue on all aspects of evaluation of PSLP;
- independent and joint reflection/ decision sessions on a regular basis through the semester;
- an end of year review of the issues arising through the year and a ‘fresh’ reconsideration of all data;
- continual reflection on the learning theory underpinning the learning experience as an integral part of the analysis;
- making improvements to the learning experience and the contexts of its use either immediately or earmarked for future implementation.

6. Carrying out the Plan

Within the action research framework the evaluation plans for each semester were prepared, discussed and adopted – refer to Attachment A. It was important to clarify the aims of each component of the evaluation.

The aims of each method of evaluation were identified first, each in relation to each other (refer to the second column of the tables in Appendix A). These aims then guided the questionnaire and interview schedule design. The interviews – the most important data source – were based on a complete question schedule and a hardcopy of computer screen dumps (most useful in bringing students' attention to key parts of the experience).

The evaluation data collection was from multiple sources and reflected evaluation aims and was related closely to learning activity cycle of PSLP as shown in Table 11.1.

The evaluation methods changed in some (minor) ways as the evaluation proceeded. So, for example:

- the video was found to be of limited value

given the close observation by the teacher followed by the immediate interview;

- the observation checklist was of no use (see below);
- the interviews were as planned though they quickly came to be focused on probing questions on specific points of the students' experiences. The observation helped us to identify which parts of the experience to concentrate upon in the interview.

7. What have we Learned about Evaluation Methods?

The following issues and conclusions are based on the progressive evaluation of the PSLP during both semesters.

We found that an observation checklist was of no value. If your focus is the relationship between interpretation and action of individual students, observation needs to be undertaken by a person with discipline knowledge. That observer needs to be looking for student decisions and choices which lead them down inappropriate paths. These are points which need to be followed by close questioning (eg 'Why did you choose X? What were you

Table 11.1. Evaluation data collection related to cycle of learning.

Key student learning action in PSLP	Evaluation data source
Students prior conception	Pre-experience questionnaire /pre-test
Learning goals for the learning exercise	Recorded by PSLP student typed responses to, and choices in questions built into, the package (these all were addressing aspects of midwifery according to the conversational framework).
Interaction with learning material	Observation/ video recording
Initial hypothesis & rationale	Recorded by PSLP as above
Interaction with simulation	Observation/ video recording
Revised hypothesis & rationale	Recorded by PSLP as above.
Interpretation of feedback	Post-experience interview/questionnaire
Interaction with simulation	Observation/ video recording
Revised hypothesis and rationale	Recorded by PSLP
Follow-up extension questions	Post-experience interview/questionnaire
Initial hypothesis and rationale for next cycle	Recorded by PSLP
Reflection	Observers and students post-test

thinking at that time? What was that question X asking you?).

Secondly, when conducting formative evaluation on prototype software as part of a learning program it is very important to:

- use the learning experience as supplementary rather than as the primary learning experiences.
- fully inform students of the nature and purpose of the evaluation and, more particularly, of the role of the learning experience in their learning in the course.

We recommend this matter be raised for open discussion for and with students several times during the course, if appropriate.

If your interest is student misconceptions arising from the use of the learning experience it is important that a person familiar with the discipline (if not the discipline expert themselves) undertakes the interviews. Only that person could quickly and easily follow student descriptions of what they were attending to and, significantly, relate student's answers to possible misconceptions, which then influenced follow-up probing questions. The one reservation is that the interviewer had to 'bracket' their own preconceptions to fully hear the students' voices and 'read' their experiences.

It was mentioned earlier that the PSLP was just part of heavily technology based learning experiences in the second semester course. This raised issues for students and influenced their reflections on the PSLP at semester end. Accordingly, we would argue the teaching team conduct an evaluation of the whole of the course even if their primary interest were one of a few major learning experiences. This is an important part of summative evaluation and has a considerable bearing on ongoing implementation. So, for example, it would help the team decide how the learning experience is presented to students and its relationship to other elements of the course in particular.

Analysis, as much as the design of the evaluation itself, is a holistic process. That is, while we can focus on matters of detail (eg 'How is this student engaging with the learning task, interpreting and acting in relation to that computer learning task instruction?'), we should keep coming back to the overall

perspective on teaching and learning, as well as the aims of the evaluation (eg 'In acting or responding that way how is the student seeing her relationship to the woman and her care?').

With multiple data sources it is important to keep all evaluation data clearly labelled in a structured manner. In an evolving and ongoing evaluation, dates must be clearly labelled on all documents.

8. What have we learned about the PSLP learning environment? Some findings:

Whilst the midwifery experts and more experienced students who evaluated the PSLP in the early paper trial and rapid prototype stages did not encounter many problems, this cohort of students had problems understanding some professional and academic language used in the package. This led to confusion and concern about whether they were doing the 'right' thing. Comments included:

"It is a bit difficult - The wording of the questions are difficult to understand"

"I found that 2nd bit [box] confusing... We really did not know what a 'hypothesis' was. It asked you about hypothesis and they never ask us about hypothesis or to make a hypothesis - or to type a hypothesis but when you are doing the inspection of the photo of the abdomen it says something about 'Does this confirm your hypothesis?' and we didn't - I didn't know what that word meant - Where did that question come from?" and

"Don't know how to take questions. Some of the wording of the questions are hard - Like we read them probably 3 or 4 times going what on earth are they asking us to do"

These comments led us to modify some questions and required tasks following the first semester evaluation. Student reaction in second semester indicated this was much less an issue.

Students did not attend to the aesthetics of the learning package and did not explore components of the package such as student

learning notes, extra screen buttons and such like, but concentrated on the guided learning experience that the ‘continue button’ advanced them to. Students found PSLP easier to use once they were familiar with it and perceived it as a useful learning tool with comments such as:

“I would use it again. I think the more you practice the better it is. We do not get a whole lot of practice on our clinicals to palpate -so it would be a benefit to use the program. I think it has to be on a regular basis though for it to be of any real benefit.”

However, some students were frustrated with extensive use of computers in second semester and grouped PSLP learning experience with other online learning. One student commented *“I don't think I will use it again- I think I would rather be in the antenatal clinic, read my book and learn in class.”*

9. What Have we Learned About Student Learning Processes and Outcomes? Some Findings:

Evaluation demonstrated students engaged with the learning task through their use of the computer and in collaboration with each other on the learning task. Each of the four themes of Laurillard’s conversational framework was evident. Aspects of a surface approach to learning were evident in students as some students struggled with this approach to learning and wanted or expected “more information” on the computer (it was our intention that students discover it for themselves). On the whole students demonstrated a deep approach to learning where they interacted with the learning task, collaborated, discussed, modified their actions and reflected on their learning comparing it to other learning experiences such as clinical practice.

Collaborative learning, not accounted for in the conversational framework, was critical for student learning. Students claimed, *“... We really discussed and learnt from each other.”* Discussion as a learning strategy was used in all aspects of the learning cycle, including during the decision-making, inputting their results and following feedback.

“Somebody thinks they are right and the other one thinks that they are wrong then you have to discuss. - You

have to make sure. That is what I like about group-work. They can say you are completely wrong or completely right and you have to put in something if you get it wrong then you go through the discussion process again”.

Feedback was crucial to their learning experience and also provided the way that students engaged with the learning task *“we discussed the feedback” - “If the computer was telling me that I was doing it wrong I will go back and do it again... I might say the head is flexed and you might say it is ‘military’ we discuss it before we put it down and if it is wrong the computer will tell us but at least we discussed it.”*

Yet we found an unexpected challenge: some students did not just want the feedback indicating they were correct or incorrect but also engaged with the computer by competing with it, trying to give ‘perfect’ answers and second guessing the answer that the computer might provide.

Our aim was to provide for feedback and interaction to assist students’ understanding and enable them to self assess and self direct their learning *“Sometimes you think you know it but you don't really. Like we knew what we were saying like the flexion or extension but we were debating and that helps.”* Other students stated:

“I really enjoyed it -even when we said ... no it is not on that side and I said it is - I liked all that interaction and that is what makes this better and I enjoyed it”

“It consolidates your learning. It shows what you don't know and if you read the questions and the hints it helps you understand the whole thing and you realise you have to do a bit more work in that area.”

“I think it is better to have done this because it makes you think about the things to look for and like after this I probably will go away and look up the things I don't know as some of the questions I don't know. It accelerates your learning like it encourages you to go away and find the answers.”

Feedback within the package was not a simple indication of whether the students have the correct or incorrect answer. It guided students' learning by providing hints, clues or questions that enabled students to repeat and modify their actions. The principle of intrinsic feedback required students to explore the world of the simulation and case study presented by the computer. Initially, students found it frustrating and wanted to know how many of their selections were correct or incorrect. However, when they recognised that it was not straightforward correct/incorrect feedback they did engage with it in a more meaningful way as indicated by students:

"I was thinking - It is telling us we have it wrong and is giving us hints on what is right". "But when those big hints started coming I knew we were wrong. I really didn't read it probably the first time and didn't take it as hints so didn't know what it was that we had done wrong."

"It makes you think all the time- when it (computer) does not like our answer it makes you think that something is not quite right about your palpation and makes you think of what you have to do."

"We had to go back and review our work. Feedback makes you think harder - By flashing that you had the answers wrong it makes you think a bit harder and longer on the questions and work and think a bit harder. "

"It was giving us questions making us re-think again making us think if we were really right - and thought I better check again."

Clear evidence of effective learning is to hear students relating academic knowledge and descriptions to practice and vice versa. Academic knowledge is then likely to be 'internalised', becoming central to the student's experience as a midwife:

"You know what you are doing like when you are feeling [palpating] but to link that to what the concept is - is difficult. Like the description thing. You don't think in terms of the concept when feeling like the attitude [a midwifery term]. You are feeling the head not the attitude which tell you the

presentation but this forces you to think of it and link to theory, not just do it."

"I find in practice you know what you are doing and you can work it out but it is difficult to translate what you find into words and describe it because you do not understand what you are talking about and this computer thing makes you think of how to describe it"

Reflection on learning task action enabled students to relate this to clinical practice and other learning experiences in their program:

"What you are most interested in and what you are looking for. It makes you think back on your clinical practice, and why you are doing what you have been doing and what you can do better next time you go out [to clinical practice]."

"It was helpful doing the computer package. I would rather have done the computer package before I go out to clinicals. I would have the knowledge and would know what to expect when I meet the woman there."

10. What Have we Learned as Teaching Professionals?

Our evaluation had an interesting twist to it due to the fact that we were sharply focused on the dialogue between student and teacher. In a real sense, we were aiming to replicate the complexity of a one to one, face-to-face dialogue. Our intention at most times was to adjust the instructions and feedback the 'computer' gives the students according to their actions and interpretations. This was a process of 'fine tuning' statements, questions, directions and feedback to students. So, in this case, some teacher aspects of the evaluation (refer to the left hand side of Figure 11.3) were explicitly part of the evaluation while the right hand side was clearly part of the learning experience of the midwifery students. More specifically, our reflection on student performance and our adaptation of the world of the learning experience/ simulation described our experience of the evaluation.

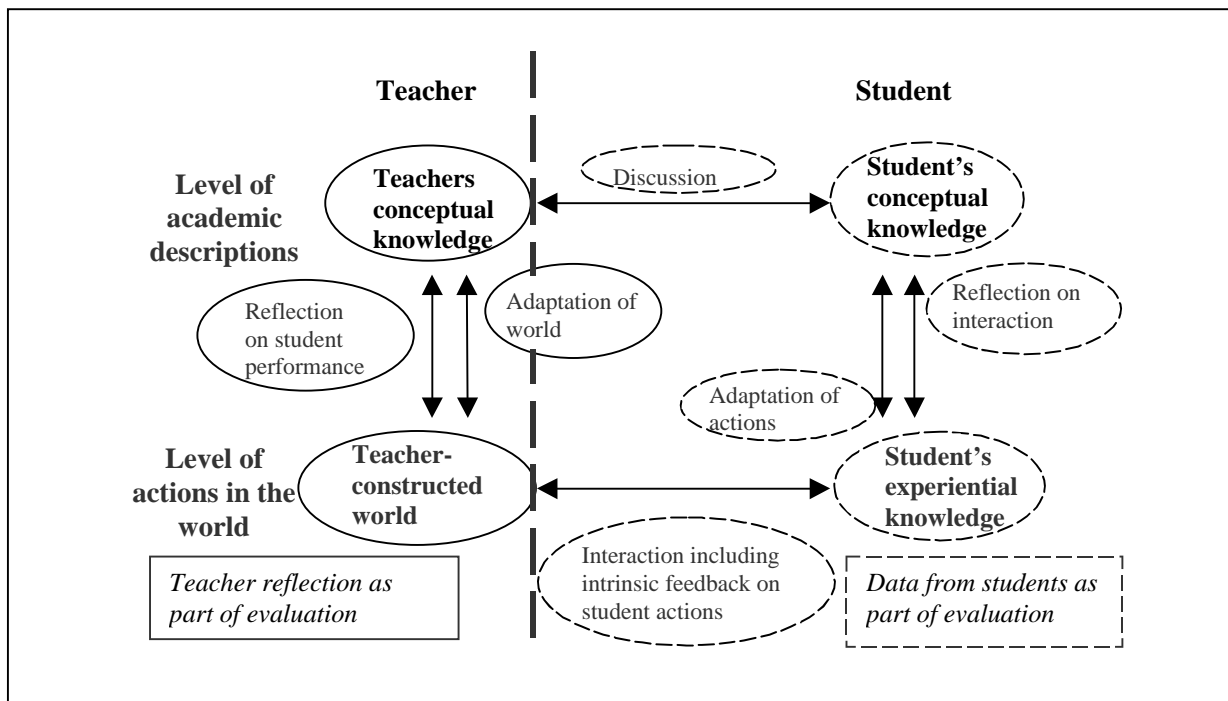


Figure 11.3. Evaluation related to Diana Laurillard's conversational framework.

10.1 Reflections of Mentor: Independent Educational Design and Content Knowledge

This project involved a close working relationship between the participants within a mentorship model of staff development. However, it was conducted in the spirit of a joint project, not as a mentor-mentee undertaking. This meant the project took more the form of a partnership between an educational designer and discipline expert - academic teacher. My focus was generally limited to the educational aspects of the teaching development. The course lecturer, meanwhile, had the responsibility to manage all other aspects of the project, including making sure the students were comfortable being the subject of the evaluation and learning all other aspects of the curriculum.

Yet I learnt this could never be a truly joint project even in relation to the educational component. This was not just because in the final analysis I was not responsible for these students' learning: I did not have the vital understanding of the midwifery content. As our goal was student engagement in key ideas of pregnancy assessment, my lack of understanding of the field of knowledge and my lack of appreciation of the potential

misinterpretations sometimes limited my contribution. Of this I became more and more aware as the project progressed.

On the other hand, being divorced from everyday action with the students gave me a 'distance' from which new ideas and questions could be posed. Through this experience I came to appreciate that constructively contributing to this project depended on me keeping the 'theory', or, more specifically, the conversational framework, firmly in mind at all times.

These experiences point to the value of independent contributors as participants in complex teaching development projects, though ultimately, in lacking the content knowledge, they can only help from the side.

A partnership of trust and respect in a solid working relationship is crucial for a project of this kind as we must quickly move into students' perceptions of the teaching and deep into the content. Only then can I, as an educational designer or mentor, feel free enough to probe students' views of the teaching and into the lecturer's knowledge (necessary to keep the focus on the key ideas).

In this project I have felt the excitement of assisting to make practical and effective a genuinely innovative teaching development. In addition, my own learning - about the complexities of the interaction between teacher, learning environments and students – has maintained my interest and sense of fulfilment through the project. I cannot see any joint project between educational designer and lecturer being successful if learning is not equally the focus of both parties.

10.2 Reflections of Mentee: Self-development in Evaluation Process

The mutual collaboration and continual critical dialogue between the mentor and the mentee was the strength of this project. This was assisted in part by the mentor being an integral member in the design and development as well as the evaluation phases of this innovative teaching development, and, therefore, had the fundamental understanding of the nature of the PSLP project. The other strength of the mentor was his in-depth educational and instructional design knowledge and the ability to engage in critical reflection and dialogue about evaluation, teaching and learning processes. This assisted us in ‘keeping on track’ and judiciously evaluating the evaluation models available to us at the start of the project, enabling us to meaningfully adopt a learning-centred evaluation model that was most appropriate for our needs and the project.

I learnt that evaluation had to be an integral part of my teaching practice, and, that evaluation is not only a summative process conducted at the end of the semester (as is usually done) or focussed on the PSLP project in isolation. It emphasised that evaluation had to be continuous and situated in the total learning experience of the students. Thus, learning-centred evaluation was not just evaluation of the educational media; but of my teaching practice, the learning environment created to facilitate student learning and the process that students engaged in while interacting with the learning environment.

This perspective also aligns itself to Laurillard’s conversational framework, which enables the teacher to interact with the learning processes and environments, to reflect on these and to modify them as appropriate to facilitate computer-mediated learning.

It confirmed my understanding that computer-facilitated learning was very different to traditional teaching practices and that it was well integrated into the total student learning experiences. It provided useful insight into learning centred evaluation and how key questions need to address students approach to learning, the educational principles underpinning the educational activity and how they engage with the learning activity to make sense of their learning experience and professional knowledge.

I learnt as a lecturer how difficult it was to divorce myself from being a lecturer and a researcher and especially to ‘bracket’ my knowledge and understanding of students and their conceptions. Contrary to contemporary understanding that students are vulnerable and would say what their lecturers expected, I found students were forthcoming and reported both negative and positive experiences.

A well-designed evaluation was difficult, time-consuming work and activities such as transcribing interviews, writing notes of meetings, discussions and observations were added workload that would not have been achieved without the help of the mentor.

11. Our Key Conclusion about Evaluation

It is crucial to select the evaluation approach, methods and analysis explicitly based on the perspective on learning and teaching which informed the development of the learning experience. If your underlying view of teaching and learning is Diana Laurillard’s conversational framework and its related assumptions, they will help you design the evaluation and should be a key reference point in your analysis. The whole integrated process of design, development and evaluation becomes an absorbing and fulfilling experience of learning in more ways than one.

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13. Appendices

To conserve paper, the Appendices to this report are only available at <http://cleo.murdoch.edu.au/projects/cutsd99>

