Change in knowledge of learning and teaching through journal writing

B.C. Dart, G.M. Boulton-Lewis, J.M. Brownlee & A.R. McCrindle
Queensland University of Technology

Abstract. This paper focuses on the analysis of learning journals maintained by 27 Graduate Diploma in Education students while undertaking a one year course of study in a subject in Human Development and Learning. It is the second in a series addressing the integration of naive and informed knowledge of learning and teaching by preservice teachers. A previous paper has explored and discussed pre- and post-subject written statements about learning as well as transcripts of stimulated recall interviews with students in response to a videotape of one of their teaching lessons during the second teaching practicum (Brownlee, Boulton-Lewis & Dart, 1996).

In this study, the learning journals yielded four types of information: (1) students' perceptions of the subject (e.g. its structure, style, assessment); (2) students' understandings of and reflections on the theoretical content presented in the subject (informed knowledge); (3) students' connection of this theory with practical teaching experiences and (4) indications of their development as learners and teachers. Analysis of this information indicated students' movement from naive to informed views on teaching and learning through declarative (knowing what) and procedural knowledge (knowing how) about teaching and learning in the early parts of the subject to conditional knowledge (knowing when and why) through the remainder of the subject. Students tended to see theory as being unrelated to practice until the first practice teaching session wherein many students' journal entries exhibited evidence of theory and practice becoming connected. Journal entries during the second practice teaching experience provided extensive evidence of the development of conditional knowledge. There is also substantial evidence of students developing metacognitive thinking through the course of the subject.

Results suggest that if teacher educators wish to change preservice teachers' beliefs then courses should be designed that (1) allow students to discuss and reflect in an open, collaborative learning environment and (2) require them to think about theory (declarative) and apply this knowledge (procedural) in an informed way (conditional) so that they can grow and develop in metacognitive knowledge, awareness and control, as they plan, regulate and evaluate the application of this theory in their practical experiences and internalise qualitative perspectives in their growth and development as learners and teachers.

Introduction

Despite the large amount of psychological research in the process of
learning the literature on learning, thinking and problem solving has had relatively minor influence on education practice generally (Biggs, 1991). It probably has had least impact on practice at the tertiary level. There is a great deal of evidence that most students graduate from universities with little but surface declarative knowledge of their disciplines and that they do not learn to think like experts in their fields of study (Ramsden, 1988). This is a cause for concern in all courses but, from the perspective of preparing teachers it is quite unsatisfactory. It is possible to "teach" after a fashion without having deep knowledge about how people learn. Such teachers act out roles and set up experiences where they transmit information and some students learn due to their own efforts and knowledge of strategies. However, we propose that in order to teach the greatest number of students effectively at any level, a teacher should have a deep knowledge of the significant factors that influence learning. Such knowledge should be organised in a structure at a sufficiently abstract level to allow the teacher to be explicit about the procedures he or she uses in teaching, that is, the elements of this knowledge should be well-connected.

Brookfield (1991) described "...an idea breathtaking in its obviousness and simplicity;... for teachers to be effective they should be aware of how learners experience learning" (p. 33). In addition, Schon (1987) suggested that at the commencement of teacher preparation courses teacher educators should begin "...by engaging teachers in tasks where they can explore their own learning" (p. 322). This notion has received increasing attention over the last twenty years in the study of metacognition and reflection. Much has been written relating to how to help learners think metacognitively (Baird & Mitchell, 1986; Beyer, 1987; Biggs, 1988; Costa, 1984; Dart & Clarke, 1991) and reflect on their learning (Hatton & Smith, 1995; Schon, 1983, 1987; Zeichner, 1987; Zeichner & Gore, 1990).

One way by which learners may be made aware of their own learning is by keeping a learning journal (Ballantyne & Packer, 1995; Dart & Clarke, 1991). It is essential that preservice teachers reflect on their learning experiences for a number of reasons; for example, to monitor their goals and progress towards them; to monitor their use of strategies; to analyse their learning; to interrelate ideas so as to facilitate understanding and meaning; and to become increasingly self aware through being able to trace both their personal and professional development. However, Brookfield (1991) observed that even though journals can be a powerful teaching/learning tool "...few efforts have been made to use them in adult education" (p. 38).

Beliefs about teaching and learning

Students in both pre- and inservice teacher education programmes bring
with them considerable informal knowledge of learning and teaching processes and of psychological concepts related to classroom teaching and learning. Beliefs about learning and teaching drive all decisions to do with teaching (Biggs, 1989). It is important what beliefs teachers hold because such cognitions are very likely to determine practice. Beliefs embody conceptions about teachers' and students' roles in terms of activity and responsibility and they help define objectives and assessment methods in terms of the expected outcomes and the types of understanding encouraged and sanctioned (Prosser, Trigwell & Taylor, 1994; Samuelowicz & Bain, 1992).

Ramsden (1992) asserted that teachers are theorists as well as practitioners and consequently their theories not only directly influence their classroom behaviour but also indirectly influence their students' learning. These theories provide important information for students that influences their own ideas about teaching and learning. Preservice teachers have had twelve or more years classroom experience which has led to their developing their own personal theories and powerful conceptions about teaching and learning with which they embark on their training courses. Calderhead (1987) believes that such theories are at a "common-sense" level. Many writers (for example, Berliner, 1987; Carter & Doyle, 1989; Hollingsworth, 1989; Powell, 1992) consider that these entering beliefs and conceptions act as a filter for interpreting their teacher education and classroom experience. It is possible that some of these entering beliefs preservice teachers bring to a learning task will promote learning while others may hinder it (Kagan, 1992). That is, they might use their

beliefs to interpret teacher education in a manner that teacher educators may or may not think appropriate.

In many instances preservice teachers view teaching as the process of transmitting information to students as efficiently as possible. So not only are teachers perceived as requiring good subject matter knowledge and communication skills, they also need good classroom management strategies. The congruent view of learning associated with this perspective on teaching is that learning is mainly a matter of remembering and reproducing the acquired information at the appropriate time. These beliefs can create problems for preservice teachers in a course wherein alternative views of learning are promoted.

An alternative model to the transmission model is one based on constructivist theory. An increasing number of teacher education courses are being developed on the basis of this model. This model emphasizes that learners actively construct knowledge for themselves by forming their own representations of the material to be learned, selecting information they perceive to be relevant, and interpreting this on the basis of their present knowledge and needs. In this model learners assume more active and interactive roles and the teacher
becomes a facilitator of learning rather than a giver of information (Dart, in press; King, 1993; Prawat & Floden, 1994; Zell & Malacinski, 1994).

Problems arise when preservice teachers lack appropriate conceptions and prior experiences to enable them to understand such novel ideas about teaching and learning. To try to make sense of these new ideas they have to accommodate their thinking and either modify or relinquish their existing cognitive structures so that they can utilize these new ideas. Research indicates however, that some student teachers find this difficult to accomplish and continue to maintain their entering beliefs throughout the teacher education program (Feiman-Nemser & Buchman, 1986; Strauss, 1993, 1996; Strauss & Shilony, 1994; Tabachnick & Zeichner, 1984; Zeichner, 1989).

In reviewing research on the effects of entering beliefs of preservice teachers in a teacher education program Kagan (1992) reported on the importance of these in interpreting course content, the stability and inflexibility of such prior beliefs, and asserted that "... we cannot expect any program of ... teacher education to effect change in teachers' behaviours without also effecting change in their personal beliefs" (p. 77). It has been argued (Johnson, 1988; O'Loughlin, 1988) that teachers' pre-existing beliefs about teaching and learning are so influential that attempts to change teaching styles will be ineffective unless these beliefs are directly questioned. Loughran (1994) suggested that all teaching should focus on and build on these beliefs and Corporaal (1988), cited in Wubbels (1992), suggested that problems of poor transfer of theory to practice resulted from a lack of integration of those theories presented in teacher education programmes with prospective teachers' entering beliefs. According to O'Donoghue and Brooker (1996) if the quality of teaching is to be improved then "... teachers must be capable of becoming more aware of their subjective beliefs about teaching and its contexts" (p. 101). To promote change in these personal theories held by prospective teachers, programmes must require them to make their beliefs explicit (Strauss, 1996). Tann (1993) believes that it might be difficult for student teachers to articulate and identify these personal theories, but once accomplished it allows teacher educators to access and engage these beliefs. This will facilitate student teachers' cognizance of their own belief systems and allow them to compare and contrast these with their colleagues' and those formal theories presented in their training programmes. This allows for the challenging of their beliefs and opportunities to evaluate these in relation to alternative views and decide whether or not to reconstruct them. This process constitutes an essential element of professional growth (Francis, 1995).

Reflection

There has been increasing emphasis during the last two decades on the
need for teacher education programmes to focus on the development of reflective practitioners. In Australia, teacher competencies and the quality of teacher education are of Federal concern as indicated by two recent reports - Australia's teachers: An agenda for the next decade (1990) and the National project on the quality of teaching and learning (1992). Both of these stress the importance of reflective thinking about the practice of teaching.

Dewey (1933) suggested that reflective thinking was necessary to solve practical problems so as to promote professional growth. More recently Schon (1983, 1987) has written about reflection related to action. "Reflection-in action" addresses thought processes during an event and allows for modification of actions as they occur. This is characteristic of a competent professional. "Reflection-on action" focuses on thinking subsequent to the completion of the event. Both of these types of reflection result from/or in constructing and reconstructing experience. In attempting to help prospective professionals integrate theory and practice, Schon (1987) suggests that we need to enable them to act effectively in situations which are poorly structured and for which there are no obvious correct solutions - situations which are characteristic of problems in the real world. Education is such a context as educational issues are complex problems and teaching involves complex decision-making in a dynamic environment. To accomplish this teacher educators need to provide learning environments that are problem-posing, dialogical and empowering for their students (O'Loughlin, 1988).

Hatton and Smith (1995) identified in their research at the University of Sydney four types of writing, three of which they specified as representing different kinds of reflection. The four are (a) descriptive writing which is non-reflective and simply refers to literature or events (b) descriptive reflection which attempts to identify reasons from a personal or literature base (c) dialogic reflection is an exploration of possible reasons through self-discourse and (d) critical reflection entails the provision of reasons for decisions or events that recognize the broader historical, social and/or political contexts. In relation to analysis of their student teachers' written material they reported that most evidenced descriptive reflection, fewer dialogic and a small number critical reflection.

They provided a framework in this study that they suggested might be hierarchical and usefully represent a developmental sequence for reflective approaches in preservice teacher education programmes. This framework moves from a focus on basic skills (technical) through reflection-on-action (descriptive, dialogic and critical) to what they refer to as "...the desired end point of a professional able to undertake reflection while action is taking place" (Hatton & Smith, 1995, p. 59).
If the quality of teaching is to be improved prospective teachers need to reflect upon (a) their present ways of knowing and on other perspectives so that they can develop a better understanding of themselves as learners, and (b) their personal beliefs about teaching and its contexts in relation to alternative models of practice. That is, they need to theorize, reflect, question and evaluate. "Reflection thus provides a theoretical foundation for the articulation, analysis and critique of a person's evolving professional development" (Stickel & Waltman, 1994, p. 3-4).

Metacognition

Beyer (1987) and Brown (1987) both provide detailed information concerning metacognition and its components and consequently only a brief overview is provided here. Metacognition refers to the knowledge and regulation learners have of their own thinking and learning (Brown, 1987). As such, it pertains to the capacity to reflect upon, understand and control one's learning.

Metacognitive knowledge incorporates a person's knowledge of learning; recognition of strengths and weaknesses, assets and liabilities in learning; understanding of task characteristics which influence approaches to learning; and information about effective learning strategies (that is, knowing what they are- declarative knowledge, how to use them- procedural knowledge, and when, where, and why to use them- conditional knowledge).

Regulation of thinking involves metacognitive awareness and metacognitive control. Awareness is the result of the learner's conscious and deliberate self-interrogation in relation to the learning task. For example: What is the purpose of this task? What is the information about? What do I already know about this? What do I need to know? Through asking questions such as these and deciding on answers learners can control their approach to, progress through and outcomes of, learning. Control involves the important functions of planning, monitoring/directing and evaluating as a result of awareness of the task. Planning entails task analysis, identifying and accessing relevant prior knowledge, goal setting, selecting appropriate strategies, considering possible obstacles to successfully attaining goals and suggesting ways of overcoming these. Monitoring includes checking to see that everything is going to plan and that understanding is occurring so that corrective strategies can be employed if required. Evaluating involves appraisal not only of outcomes but also of the processes used to achieve these.

Baird (1991) emphasized the importance of the relationship between reflection and metacognition. He proposed that this relationship is illustrated through the interaction of processes (reflection and
action) and outcomes (level of metacognitive knowledge, awareness and control). That is, metacognition is an outcome of reflection. Ertmer and Newby (1996) stress the importance of reflection for expert learning. Expert learners have more metacognitive knowledge of themselves as learners, and their learning is "...reflected upon more than is the learning in which others engage" (Berliner, cited by Ertmer & Newby, 1996, p. 4). This implies that expert learners have higher levels of metacognitive awareness and control as Baird (1991) suggested. When the learner reflects on learning further knowledge about self, task and learning strategies is generated which then becomes available for increased awareness and control (self-interrogation, planning, monitoring/directing, evaluating) of future learning activities. As Ertmer and Newby (1996) assert "...reflection provides the critical link between the knowledge and control of the learning process" (p. 3).

Metacognition is necessary for constructivist learning in that how a learner attempts to develop meaning and understanding is influenced by their prior knowledge and beliefs. New experiences are interpreted on the basis of what the learner already knows and believes. If learning with understanding is characterized by the development of connections-between elements of the new material, connections between new material and prior knowledge, connections between formal knowledge and intuitive beliefs- then the learner must engage in reflection. Baird (1991) argued this leads to enhanced metacognition and "...allows the learner to undertake the constructivist processes of recognition, evaluation and revision of personal views" (Baird, Fensham, Gunstone & White, 1991, p. 164). Similarly, Biggs (1994) stated that a constructivist approach to learning is characteristic of a qualitative outlook on learning. This approach, a deep approach, requires the learner to be both reflective and metacognitive.

Since reflective thinking and metacognitive strategies do not automatically develop in learners, learning activities need to be structured so that they teach and support the use of metacognitive skills (von Wright, 1992). That is, learning environments that facilitate the adoption of deep or transformative approaches to learning need to be designed and implemented if such learning is to occur.

Journals

A number of researchers have indicated the importance of writing tasks in fostering reflection and the development of metacognitive thinking (Dieker & Monda-Amaya, 1995; Fellows, 1993; Francis, 1995; Hoover, 1994; McRindine & Christensen, 1995; Sparks-Langer & Colton, 1991; Wilson, Hine, Dobbins, Bransgrove & Elterman, 1995; Zeichner, 1987).
Ballantyne and Packer (1995) identified a number of contexts in which student journals are useful as a teaching/learning aid. Two of these, academic and personal, are representative of the use of journals in this teaching subject. In the academic context, journals are used as a means of enabling students to engage material that has been introduced in class sessions. In the personal context, journals provide opportunities for students to examine their self-development as learners as well as their evolving professional development as teachers. In both contexts, journal writing serves a constructive as well as a reflective process. That is, in the process of sense-making and understanding, journal writing enables learners to recognize their own relevant ideas and beliefs (recognition), evaluate these in terms of what is to be learned and how it is to be learned (evaluation), and decide whether or not to reconstruct their ideas and beliefs (decision). This constitutes what Gunstone and Northfield (1992) referred to as informed decision-making and forms the basis of their conceptual change programme. It also represents what Grimmett (1989) described as "reflection as the reorganization or reconstruction of experience" (p. 22). Thus, journal writing empowers learners to be active constructors of their own knowledge and serves "...the important function of integrating course content, self-knowledge and practical experiences with teaching and learning situations" (Yinger & Clark, 1981, p. 25).

Structure of the subject, "Human Development and Learning"

O'Loughlin (1988) and Strauss (1996) have recommended that we need to change the way educational psychology subjects are typically taught to prospective teachers because they do not address the personal theories these students bring with them which they use to interpret what we teach them, "...courses such as educational psychology actually serve to reinforce and confirm the narrow, unexamined and often mystical assumptions our students hold" (O'Loughlin, 1988, p. 3). Recognition of problems such as this led to a change in teaching approach of the predecessor to this subject by the first author in the late 1980s which resulted in the publication of a paper describing this teaching approach and an evaluation of its effectiveness (Dart & Clarke, 1991). This approach to teaching has been further modified and its latest version is reported in detail in Dart (in press).

The approach to teaching in this subject is based on constructivist learning theory and represents a conception of teaching characterized as "Level 2", teaching as an activity aimed at changing students' conceptions or understanding of the world, in Samuelowicz and Bain's (1992) classification; a "learning facilitation orientation" according to Kember and Gow (1994); and "Approach E", a student-focused strategy aimed at students changing their conceptions, in Prosser, Trigwell and Taylor's (1994) scheme. The teaching in this subject was designed to
enable students to focus on their beliefs about and intentions for
learning, to engage "...in the constructivist processes of recognition,
evaluation and possible reconstruction of personal views, abilities and
attitudes" (Baird, 1991, p. 102), and to develop relational
understanding of the content of the subject, that is, understanding
characterised by connections between new knowledge and existing

Underlying the purpose of this subject is the belief that if you want
to become a good teacher, then you need to know how students learn. If
you want to know how students learn, then you first need to know how
you learn yourself. Therefore, an aim of the subject was to help
students become more aware of and understand what was happening in
their own learning experiences. They were given opportunities to exert
greater control over the context of their learning as well as to learn
and use relevant cognitive and metacognitive strategies associated with
a deep or transformative approach to learning.

Numerous educators have emphasized the importance of social interaction
(collaboration) in fostering reflection (Baird, 1991; Francis, 1995;
Hatton & Smith, 1995) and understanding (Brown, 1988; King, 1993;
Prawat & Floden, 1994). Many of the learning experiences in this
subject were effected in a collaborative learning group (n=3) situation
in which students discussed, shared their understandings, and
questioned and assessed their own and others' beliefs in relation to
set readings, session material, learning journal entries, and learning
and teaching experiences. These learning activities encouraged not only
reflective, but also metacognitive thinking. The relationship between
the academic teacher and the students was also one of collaboration in
that the teacher assumed the role of a facilitator of learning rather
than a transmitter of information.

The content of the subject included theories of adolescent development
and issues associated with this period of development as well as
educational psychology topics. These topics included learning (theories
of learning, models of learning, and learning strategies); motivation;
classroom management; learning styles; and teacher expectation effects.
There were three assessment items for the subject. The first was a
seminar on some aspect of adolescence presented to the whole class by
each collaborative learning group and assessed as a group (30%). The
second was an individual negotiated learning contract addressing some
aspect of educational psychology (40%). The journal that students
maintained through the year-long subject constituted the third
assessment item (30%).

There were two practice teaching periods for students in the subject.
The first was for a period of five weeks and the second for six
weeks. Therefore, the academic year for the students consisted of five
phases which will be referred to in subsequent discussion as phases 1, 2, 3, 4 and 5.

phase 1: nine weeks of university-based learning, followed by
phase 2: five weeks practicum, then
phase 3: a further seven weeks of university-based learning
phase 4: another six weeks practicum, and finally,
phase 5: three weeks of university-based learning.

There were also two weeks of independent professional study at the end of each semester.

This paper focuses on describing and interpreting the changes in student teachers' thinking about learning and teaching as recorded in their learning journals.

Method

Subjects

The students in this study were enrolled in the Post Graduate Diploma of Education (Secondary Teaching) in 1995 in the Faculty of Education at the Queensland University of Technology. They were studying a core subject in this course, Human Development and Learning. Originally there were 35 students from two classes involved. However, full data (including the learning journals) were obtained only from 27 of these students. There were 16 females and 11 males in the sample. Their ages ranged from 20 to 41 years with fifteen aged 25 years or younger, six were aged between 25 and 30 years, and the remaining nine were older than 30 years. One student held a Ph.D. in Science, seven others held first degrees in Science, 14 held first degrees in Arts, and the remaining five held first degrees in a variety of disciplines.

Procedure

Students were told that the main purpose of the journal was to aid them in their personal development as a learner and their professional development as a teacher. They were introduced to different ways of keeping a journal and the types of entries which might be useful to make in relation to the main purpose of the journal. Examples from journals of previous students were used to illustrate different ways in which these students had approached this task.

Francis (1995) and Hatton and Smith (1995) identified difficulties associated with journal writing. These included students feeling vulnerable as a result of disclosing their beliefs to others and in some cases being reluctant to do this; the notion that teaching is about action and that journal writing is not perceived as teacher work; and problems related to the assessment of journals, in particular, writing so as to meet the perceived expectations of lecturers. No such
difficulties were experienced by students in this subject. This was possibly because of the relationship between students and the lecturer. Some students did however, have some difficulty in starting their writing. They wanted more structure than that provided initially by the lecturer, so they were given extra support in their initial attempts at writing. This support consisted of a series of questions that they could address in order to prompt their writing. For example, What did I think or feel about the issue? Why? What did I already know about it? What did I learn? What did I consider important in relation to it? What else do I need to know to better understand it? How might I use my new knowledge and check it out? Students were given the opportunity to submit their journals at any time to their lecturer for feedback purposes. Only some of the students accepted this offer, most choosing to discuss their writing with their learning group colleagues.

Analysis

Student learning journals were analysed using an approach that could be called "interpretive-descriptive" (Maykut & Morehouse, 1994). Two of the authors read through all 27 learning journals a number of times to obtain a global view of the content and entries were then classified into categories on the basis of themes using an inductive approach. Material within categories was then read and reread to identify subcategories within the themes on the basis of specific content within the data. Although this was determined mainly inductively, since much of students' writing dealt with learning and teaching issues in relation to personal and professional development, theoretical notions reflecting constructivism and metacognition influenced this process of data interpretation to some extent. Each student's journal entries were analysed for each of the five time phases of the subject and this allowed developmental changes in their knowledge to be identified.

Results and discussion

The results of the study are presented in accordance with the four major categories that emerged from the journals: comments about the subject itself, information on learning and teaching presented in the subject, connections between learning and teaching theory and practical teaching experience, and development as a learner and teacher. Each of these categories is subcategorized and these are identified in Figure 1.

Figure 1. Categories and subcategories which emerged from the journals.

Examples of these are provided in the following text.

The subject itself
Overall impressions

The comments relating to the subject itself were generally positive.

Early in the subject (phase 1) students commented that:
"I'm not too clued up on human development and learning- I think a lot of it is overrated";
"Human development and learning- my first impressions are way off, I'm getting a lot out of it. I like the openness, the opportunity to express your opinion, practising what you preach, and the assessment";
"... lot of my views being challenged and altered this year";
"I am learning not only about teaching, but also about myself and my views".

Towards the end of the subject (phase 5) students made the following sorts of comments:
"Underlying theme of this subject is that the teacher is the part of the same learning process as the student- I will always continue to learn";
"... helped me develop as a teacher and a person";
"Topics for conversation in and out of class became- learning about learning, thinking about thinking, learning how to learn"; and
"I gained a great deal from this subject- the diversity of the subject, it was different from anything I've studied; its relevance and transfer into strategies in the classroom; casual way classes given; I was impressed with the assessment."

Teaching-learning model

Two students described the effects of previous transmissive experiences on their learning at the start of the subject.
"... taught to reproduce and regurgitate, except this year- it has been difficult not to write down every word and learn it"; and again
"... used to the transmission model, this course favours an interaction model- this is more difficult and taking time to get used to."

This suggests that for these students it is not an easy task to change their approach to learning. Nevertheless, at the end of the subject these two students respectively commented:
"This unit has taught me how to think"; and
"Despite the pain of having to think, I gained a lot more from the unit and probably remember it better too"

Another student, reflecting on his learning in the subject, had this to say at the end of the course:
"This learning has necessarily been not only of a type that requires understanding of the content, but is more importantly about exploring relationships."
Learning activities

The learning group seminars were seen as a useful learning activity for a number of reasons. Some of these are reflected in the following comments:

"While preparing the seminar I realised there was more to teaching than knowing content";
"Seminars were a valuable part of my learning experience through preparing, working together and presenting"; and
"Seminar presentations were important in encouraging and inspiring quality; clear, useful information was provided; they reinforced readings and discussions; plus they provided further food for thought".

The learning contract, a new experience for most students, was perceived as being useful:

"I am confused about expectations for the learning contract, however it has the potential to be beneficial"; and
"The learning contract extended my understanding of theory and its links to practice."

Most statements (88%) relating to the learning journals and their value were positive, referring to opportunities to reflect on learning and suggesting that their self-development had been facilitated. For example,

"...I feel positive about completing it, and it is vital for me to continue to keep it. It is a valuable history that I may draw on or add to and it promotes a higher level of teaching and learning awareness and understanding";
"...the journal enabled me to critically evaluate and reflect on my personal growth and development, keeping in touch with the self-development process";
"...on looking back over the journal, I can see how many of the theories that I put on paper are now an internal part of my teaching"; and similarly
"Reading over the journal I can see how these strategies have been used in my teaching, some became a part of me as a teacher"; and
"Reflective writing and critical incidents reporting gives teachers opportunities to reflect on their concepts and question them."

On the other hand, some statements (12%) indicated a lack of enthusiasm for keeping a journal at all. For example:

"When I heard I had to keep a learning journal I cringed with pain";
"I viewed the learning journal with annoyance."

Information on learning and teaching

Students' entries relating to the information on learning and teaching
encountered in the subject were found to refer to the what, how, and the
why, of learning and teaching, that is, they could be classified as
representing declarative, procedural and conditional statements. This
was the basis for forming subcategories within this theme. It was
further found that entries within this theme could be characterized as
representing naive and/or informed knowledge of learning and teaching.
Naive represents little or no evidence of a theoretical knowledge base
and/or is without relational understanding of a theoretical concept.
Informed represents evidence of a theoretical knowledge base and
relational understanding of the theoretical concept. Consequently, the
subcategories of declarative, procedural and conditional were further
split into naive and informed.

Naive declarative knowledge

One student made the following entry relating to teaching during phase
1 of the course:
"I think the singlemost important thing which has dawned on me this
week (and it is not only related to reading) is that teachers need to
be firstly, enthusiastic, and secondly, imaginative. If the lessons are
interesting and fun, the students are more likely to learn, and they
will also probably be easier to handle."

Naive procedural knowledge

In commenting on learning styles, two students made the following
entries:
"Teachers should cater for different learning styles" and
"...(it is) vital to cater for the different learning styles, and to
make it interesting."

Two student talking about classroom management remarked:
"A fault with many teachers is that they only tell their students when
something is incorrect, the good must also be acknowledged."
"A point to be aware of though is to keep in mind strategies for
dealing with a student (or group) who does not want to participate in
any activities you might have planned."

Naive conditional knowledge

Concept mapping as a learning strategy proved difficult to master for
some students. An entry illustrating this was:
"I don't know if I will be able to get a handle on these concept maps.
I prefer myself to write linear notes once I have read an article or
book. I just think it is easier that way to do that rather than taking
up so much room, not getting things right the first time and stuff. I
keep making mistakes about what links with what. May be I just need to
practice them."

Another student, discussing his first practice teaching experiences
wrote:
"...difficulties on prac with how and when to respond to kids asking for help. I was sometimes unsure as to when I should provide help and when to say 'no! do it yourselves.' There were three possibilities: give them what they want- but they don't learn anything; carefully guide them- but this takes time; say 'work it out yourselves'- but am I then teaching?"

Informed declarative knowledge

One student's entry reflected this in her joy at discovering her own preference for receiving sensory information: "I am very excited to discover the variety of learning styles there are. I discovered I am a visual learner- no wonder I enjoy working in visual mediums. I will have to be diligent in teaching to include strategies for all learning styles and not just favour my own learning style."

Another student also evidenced this in a comment relating to constructivism: "Constructivism seems to be the word of the day. It took me a while to appreciate it fully- remoulding one's reality through constructing knowledge for oneself. I think Physics would be ideal for this. Constructivism, in my view, is truly the approach which should be the basis for most teaching. That is, instead of telling students the answer, they are required to develop it for themselves, thereby reshaping their conceptions according to what they discover."

The discovery of personal meaning and the difficulty of using this in teaching is shown in: "While this is a great diagram (of Erikson's theory of personality development) and it provides me with interest in determining what stage I am at, I am concerned that at this point in my development as a teacher I cannot see where I can apply this knowledge."

Informed procedural knowledge

Comments here related mainly to practice teaching experiences during phases two and four. These included the following entries: "There are always cases where discipline is necessary. For this reason, with my own class, I will establish a set of classroom rules, in accordance with the school discipline policy, which will be written in English and, for my LOTE class, in the LOTE as well, and pinned up on the wall of the classroom. These rules will be negotiated with the students and the consequences of breaking the rules will be decided."; "You will see that I utilise newspaper articles to enhance student learning through providing relevant and real life connections between the information presented and its impact on society, and actual
examples of such content. Through the use of newspaper articles, I responded to the different learning styles of students, that is, visual, reading, kinaesthetic, and auditory by presenting information in different forms."

Informed conditional knowledge

Journal entries representative of this subcategory also focused mainly on practice teaching experiences. For example:
"In forming rules for the classroom, I think it is important that students have input into what the rules are and the consequences if they break the rules. If students have this kind of input into rules formation, then this eliminates students feeling that punishment is unfair as they are already aware of the consequences;"
"There is a Year 8 student who, I think, fits into the category of learned helplessness. He is very unmotivated, experiences no successes, has a very negative attitude and is disruptive".

"Attribution theory makes sense. I would like to apply it to some Year 8 art students. A couple simply say 'I can't draw'- they even demonstrate it. I didn't ask why at the time, but I expect I would have got a reply like 'I'm just no good at it, every time I try it comes out terrible' - learned helplessness."

The number of journal entries in each of the above subcategories was determined for each phase of the study. These were then represented graphically and are presented in Figure 2.

Figure 2. Information on learning and teaching statements over the five phases of the subject.

This figure can be interpreted in several ways. For example, (1) the number of naive as compared to informed (2) the number of declarative versus procedural versus conditional and (3) a combination of (1) and (2), that is, the number of naive declarative versus informed declarative, naive procedural versus informed procedural, and naive conditional versus informed conditional statements. These interpretations can be carried out within phases and for the subject as a whole.

It is obvious from Figure 2 that the pattern of statements varies within phases and across phases. During phase 1 there are slightly more naive comments than informed comments. This is understandable as students, being unfamiliar with educational studies, have only their own naive beliefs available initially to use as a framework to interpret new material presented in the subject as they attempt to make sense and develop meaning. There is a focus within these naive
statements on declarative knowledge as students described what they know, rather than how and why. However, within the informed comments (which occurred more towards the latter weeks of this phase) there is an equal concentration of declarative, procedural and conditional statements.

A significant decrease in entries occurred during phase 2 as students were engaged in their first practical teaching experience. For most students this was an 8am to 4pm, five day a week event, with many extra hours required each evening. Most of their activities and energy were directed towards coming to terms with the real world of the classroom and school, in particular the preparation and planning of lessons to be taught. As a result, there is less time available for maintaining the learning journal. This is illustrated in the following comments: "The feeling of not having enough time is a very strong one"; "...On Prac, I was very busy just trying to survive. There was little chance to stand back from the whole situation and analyse it"; "Prac, Week 3: Wow! I've learned an enormous amount over the past three weeks. I really should have made one entry each week, but I think I've done OK so far in this journal and haven't missed too much, so I'll try and think over some of the more telling experiences."

The entries during this phase showed movement away from naive to informed knowledge, focusing on procedural, and in particular, conditional statements. This is most likely due to the opportunities during practice teaching to try out 'theory' encountered at university in the real world of the classroom and evaluate its usefulness.

Students were back at university in phase 3 and this is reflected by the large number of informed compared with naive statements. Students were now writing from an informed theoretical perspective, the main focus being on conditional knowledge which indicated their attempts to make sense of and understand the content of the subject. There were still comments reflecting procedural knowledge as students planned out how they would go about teaching in the next practice session.

Journal entries during their second practical experience (phase 4) were almost exclusively informed. About one-third were procedural, reflecting students' concerns with how they had applied various teaching strategies. The remainder were conditional, reflecting their need to know when to use certain strategies and why they did or did not work..

Phase 5 extended over the last three weeks of the subject. As class sessions during this time focused on their practice teaching experiences and the relation of theory to practice journal entries for this period were reduced. Nevertheless, most statements were concerned with informed conditional knowledge as students endeavoured to tie up
loose ends and exit with a theoretically-informed knowledge base relating to teaching and learning. This would serve as the starting point in their professional career as a teacher.

Overall, Figure 2 clearly illustrates the change from naive to informed knowledge as the subject progresses, as well as the changing focus of their knowledge from declarative through procedural to conditional.

Connections between learning and teaching theory and practice

Students made numerous journal entries relating to the theoretical information concerning learning and teaching encountered in the course. Some of these referred to theory (T) in isolation, that is, independent of practice (P), or practice divorced from theory (no connection); while others described the relationship between theory and what it meant for their learning and/or teaching or how practice informed theory (one way connection); and others linked theory and practice recursively, that is, theory informing practice and practice informing theory (two way connection). These three types of linkages provide the basis for examining this third theme of connections between theory and practice.

No connection (T  P)

Most entries of this type were made during phase 1 of the subject as exemplified by the following comments from two students:
"On the weekend I read a chapter on Erik Erikson's Theory of Identity Development. While this is a great theory and it provides me with interest in determining what stage I am at, I am concerned that at this point in my development as a teacher, I cannot see where I can apply this knowledge"; and
"I would like to teach students in a constructivist way that will lead to a deep approach to learning from the students. I am not sure whether this will be difficult or easy to do in the schools";

However, another student reflecting on her second practice teaching experience wrote:
"I found the most effective way to encourage improved behaviour was to catch his friend doing something well or displaying good behaviour, and to compliment the improved effort".

One way connection (T->P or P->T)

Journal entries of this type reflected students' emerging views of the relationships between theory and practice. Some were general comments,
reverse.

An example of a general comment of this type is provided by a student making this entry in phase 5:
"Many of the concepts now make sense and are able to be related to the classroom, and I think for me, that is the biggest success. I never thought any of this would have a place in the classroom, and I never thought that I would be able to practically implement what I have learned at Uni.- I was proved wrong".

Two students described how course content helped them become more self-aware:
"I have learnt so much in the past three weeks, not only about teaching, but also about myself and my views. In studying identity formation in adolescents, I can relate so many things that I have read and also what we discussed in class, not only to my own teenage years but also to myself now"; and
"I have learnt a lot about myself, my past, experiences I have had throughout my life, and why different things seem to relate the way they do in varying circumstances with different people. It has helped me to understand my own life, as well as hopefully help my children".

The usefulness of concepts maps for personal learning was illustrated by a student who also described their value as a teaching strategy. She wrote:
"I used concept maps in my own learning- it put all the information in a global perspective, highlighted the connections between topics and how they were linked, and formed the basis on which I was able to write my essay, and so enhanced my self confidence"; and
"By seeing and experiencing the benefits of concept mapping as a learning tool, I can use it in my teaching- conveying information to students and highlighting in a pictorial sense, the connections."

Some students described feelings of disappointment when they perceived that course material was not being implemented in the practice schools. For example:
"Prac was a very difficult time for me- I found myself angry and upset to discover that a great many of the things I had learned, discussed and examined throughout the year at Uni. were not being put into practice."

One student wrote during phase 1 (before the first teaching practice session) of his aspirations in relation to teaching during this time. "What I want to do at prac.: I want to construct my own opinions of students and not take on those from the staffroom. I want to try out some different teaching strategies such as group discussions, hands-on prac., individual work, varying questioning techniques, and the use of lots of demos., if I can. This way I will be able to test them out and see what works well for me, and where I still need improvement, while
being under the supervision of another teacher who can jump in if I get in over my head."

The practice teaching experiences must have been successful for the same student wrote in phase 5: "I feel that only a few subjects have really impacted on me as a teacher, however, I think prac. is where I truly developed."

Other comments relating to teaching included:

"Teacher is not a provider of knowledge like an encyclopaedia, but a facilitator of learning- stimulate their minds, get them thinking and asking questions, make things relevant and enjoyable";

"A challenge to teachers is to help motivate students intrinsically- help them discover importance, relevance, and value in what they are doing"; and

"Mainstreaming is wrong! Students have an amazing ability to respond and perform to the expectations of the teacher. So if the teacher thinks the kids are a bunch of 'no-hopers', then of course they will live up to the expectation. The whole learning environment will be a very negative one, where failure will become apparent. If the students are seen as 'losers at school', then no doubt their self-concept will be carried on into their adult lives".

Two way connection (T<->P)

Students made most entries of this nature during phases 4 and 5 as they reflected on their final practice teaching experiences and the subject as a whole. Some entries were of a general nature while others referred specifically to learning but mainly to teaching. Examples of general entries included:

"This experience enhanced my learning at university as it allowed me to make connections between the information taught at university and the real life application of it at schools"; and

"It all started to feel like it had some relevance to me when I came back to QUT after prac. I started to see the connection between what I had been reading and what I had been doing in the classroom. I was able to reflect on my teaching and see how a particular approach was working, or why it perhaps was not working, and what could better be applied".

Entries focusing specifically on teaching are represented by:

"My observations, inquiries, research and interpretations have made me aware of a variety of factors which influence effective teaching and learning. This activity helped me to understand and plan learning experiences for students of varying ages, stages of development, and cultures, with an awareness of their physical and academic abilities and needs"; and

"Prac. teaching focus- Qualitative learning: From my observations, this
class had been exposed to a learning environment which was dominated by the teacher. In my lesson I modelled, then let them work in pairs, and encouraged them to try and work it out for themselves. I moved around the room so that I was not the focus. Outcome: Students felt empowered as though they were just as smart as the teacher— they were constructing their own meaning"; and

"Lately I have been trying to put into practice a few things I have learned— like catering for different learning styles: auditory, kinaesthetic, reading, visual. I have been trying to create more handouts, and am now breaking out of the flow I was in last prac. I have started using OHTs, and am benefiting from it, in that I have more time to talk to the class and monitor them, instead of writing on the board. I can also present material with colourful diagrams which aid more visual learners. I have also been trying to put things in tables, comparing and contrasting, to enhance student understanding".

Distribution of statements representing these three types of connections was determined for each of the five phases. This is represented graphically in Figure 3.

**Figure 3. Connections between theory and practice over the five phases of the subject.**

Examination of figure 3 indicates that most statements relating to connections were made during phase 1 and that most of these exemplified a one way connection as students were introduced to theory relating to learning and teaching, that is, they were attempting to work out how to implement this knowledge. During phase 2, the first practice teaching period, students were concerned with how theory informed practice and vice-versa, that is, two way connections. On their return to university in phase 3 there was a renewed focus on one way connections as students encountered new material in the subject and were concerned with how it related to practice. However, interest in two way connections was maintained and this was the case for the remaining two phases of the subject. Entries during phases 4 and 5 were almost exclusively concerned with reciprocal relationships between theory and practice as students endeavoured to establish workable strategies, particularly for teaching.

**Development as a learner and teacher**

Many of the entries in students' journals related to their learning and teaching experiences. This was no surprise as the major objective of their journal writing was to provide evidence of their growth and development over the course of the subject through entries focusing on these aspects. These entries were examined for evidence of changes in personal beliefs about learning and teaching which would be considered
as indicating development. Furthermore, statements indicating belief changes were of a general nature in some instances, while in others they represented reflections of students in the roles of learner and teacher respectively. In some cases, students provided reasons for their belief changes. Examples are provided for each of these types of belief changes. For example:

**General**

"At the beginning of the year, I had no idea why we had to study HD&L, I truly thought it was a waste of time. Now, when I reflect on those views, I realise that I had them because I did not know the meaning and importance of the information that we were provided with."

**As a learner**

Reflecting on the course material

"In the past I considered assessment as a problem- something which detracts from education. Since learning about the 3P Model, I now appreciate it as a part of the skill of teaching"; and

"When I first came into this subject I was unable to understand a lot of the educational language that was being used- I had nothing to relate the information to and basically felt that the entire subject was a waste of my time and the university's money. It was not until after the first prac. that things finally started to make some kind of sense. Many of the concepts we covered in class were discussed by the staff at my prac. school, and I soon learnt that the language that was used in this subject at uni., was also used in the real world of teaching as well- this was a great relief."

Reflecting on theory and practice

"The goal I was originally pursuing in this subject was to pass- now I have been focusing on gaining an understanding of the subject matter and how it relates to the way I teach"; and

"During the beginning stages of this course, I felt that I was not being told anything new and that I was learning very little. But now, at the end of it all, in hindsight, I realise that I have understood an incredible amount of information, learnt new skills, and find myself relating things that I have learnt in theory to prac. school situations as well as real life";

"Many of the concepts now make sense and are able to be related to the classroom, and I think for me, that is the biggest success. I never thought any of this would have a place in the classroom, and I never thought that I would be able to practically implement what I have learned at uni.- I was proved wrong"; and

"While it is very hard for me to let go of it, since it is all I have
known and it has worked well for me, I am beginning to realise how
detrimental an effect assessment can have on some students- on their
feelings of self-worth, their self-efficacy, and their whole opinion of
themselves and their place in the world."

As a teacher

Reflecting on the course material

"Until this year I really didn't know that such a variety of learning
styles existed- I thought that it was like you see on the label `one
style suits all'- how naive I must have been. I now have the skills to
cater for everyone";
"The point about it being unethical to assess in a method different
from the one you use to teach, came as a bit of a shock to me I must
admit, as I had never thought about it before"; and
"Learning difficulties were something I had never given much thought to
before today- the seminar really opened my eyes and presented a much
wider view of teaching than I had ever thought possible, or to be
honest, necessary. Suddenly, a whole set of barriers to learning has
been presented to me which I am going to need to incorporate into my
philosophy of teaching."

Reflecting on theory and practice

"My third lesson was one which resulted in a conclusion as to what
strategies worked best with regards to the class and myself. I realised
it was not necessary for the teacher to be the only one talking for the
whole lesson and providing information";
"Learnt the difference between unproductive and productive noise from
the LD teacher- I had been confusing the two and was disrupting good
work. This was an important lesson";
"I did not see the necessity of having rules before prac., however,
during prac. I quickly became aware of the necessity to create rules
and guidelines, particularly for years 8 to 10";
"Today, I was interviewed by Jo about the lesson and my preparation,
methodology etc. It was a very worthwhile experience. For the first
time I really stopped and thought extensively about how things I
learned at uni. related to my prac. I discovered that in fact most of
what I did in the classroom was based on theory. Some of it was quite
unconscious and was only something I could recognise in hindsight, but
most of my decisions and actions were firmly based on theory- more than
I had realised at the time of teaching."

One student had entries through the first four phases that illustrate
clearly his development as a learner and teacher. These entries were:

"It was through learning about constructivism that I realised how much
I have yet to learn as a teacher, which silenced my thoughts about
being ready to teach now" (phase 1).
"This is an important lesson to learn, that most teaching points take much longer than anticipated, once questions and worked examples are considered" (phase 2).

"I suppose I did get a lot out of prac. after all- understanding what not to do is just as useful as understanding what to do. It seems that prac. is useful for the former, and uni. for the latter" (phase 3).

"I know I am ready to become a teacher and am looking forward to next year immensely" (phase 4).

Other observations

It is also possible to examine students' journal entries from a perspective of the types of reflection involved. The majority of student entries in their journals were indicative of reflection on action, mostly of teaching experiences while they were at their prac. school. However, other entries illustrated reflection on their own learning experiences. This finding is not unexpected as it is at practice school that students get the opportunity to put theory into practice and to test their embryonic understandings of subject content related to teaching and learning. The journal provided the scope for students to recreate experiences, to analyse and evaluate these, and integrate their thinking and experiences in the process of sense-making. It is likely, however, that reflection in action occurred as students took responsibility for teaching their classes, and thought about what was happening and why it was happening as it happened and responded to the unexpected events that are characteristic of classroom life. For example:

"I should not ask 'who did not understand?' - no one will own up";

"I was most annoyed with myself when, in my first physics lesson, I relapsed into doing/not doing things that I had gotten over last semester. I was forgetting simple things I had learnt before: use of voice- boring monotone; gaining attention; aimless gestures; order of lesson- homework first, did not catch interest. It takes a conscious effort to maintain a new style, and is very easy to fall back on old ways";

"So many times during prac. I could see how the students were moulded by the teachers' expectations. It's like the self-fulfilling prophecies we talked about in class. I was aware of the students who wouldn't even try for fear of failure, and conscious of those students who had reached a learned helplessness stage. I was also aware of those with low self-efficacy."

Most journal entries exemplified descriptive reflection, similar to the findings of Hatton and Smith (1995). Some examples of this are represented by the following:

"I do believe part of the problem may have been the teacher's
expectations of this class. I don't think he expected much achievement from them and that is what he got. Perhaps these students had been trained to be lethargic because of lack of teacher expectations. In comparison, my art supervisor constantly lifted expectations of student achievement and the result was a high proportion of students achieving excellent outcomes and marks"; and

"There were no problems with 8I over homework- I believe it was this non-confrontational approach that led the students to choose to do the work on time, when they saw I would check it, I cared if they had done it, and instead of asking them to stay in to do it, they were asked to stay in and explain why they had not done it. For them, this seemed a much less desirable situation than simply doing the homework";

"It may have been good to have gone through the paper first, to clarify the questions. This would save the constant questioning which occurred. Again, this comes down to knowing the level you are teaching. You will need to ask yourself- have I clarified it enough?";

"This was where I learnt that effective teaching involves the effective facilitation of learning, and the management of learning in the classroom. By keeping the students busy in the form of interesting activities and responsible for their own learning, it created a better learning environment and students were less tempted to talk."

The following is an example of dialogic reflection. However, there were few of these.

"Difficulties on prac. with how and when to respond to kids asking for help. I was sometimes unsure as to when I should provide help and when to say 'no-do it yourselves.' There were three possibilities: give them what they want- but they don't learn anything; carefully guide them- but this takes time; say 'work it out yourselves'- but am I then teaching?"

As well as examples of various types of reflection, there was extensive evidence also of metacognitive thinking throughout the learning journals. Student journal entries illustrated their developing knowledge of themselves as a learner and teacher, as well as of the tasks of learning and teaching. In addition, other journal entries demonstrated students' regulation of their learning and teaching through the processes of awareness and control. Examples of metacognition are presented within these subcategories.

Knowledge

Self as learner

"I am an achievement oriented student";
"I like working by myself, not worrying about other people letting you down, having different opinions"; and
"I learn more from talking/listening experiences."

Self as teacher

"Next year I will be a teacher, but I will see myself as a student learning how to teach better, refining, reflecting and capitalising upon the good ideas that I come across";
"I aim to establish a classroom setting where I am merely a 'tour guide' taking the students along a path of learning experiences";
"As a teacher...I would accept students for who they are and respect them";
"I respond to different learning styles by presenting information in different forms";
"I consider myself to be a facilitator- giving students tools they need to learn, by way of encouraging intrinsic motivation";
"I have now proved to myself that language can be taught using a constructivist approach, using it in one lesson was successful."

Task of learning

"Learning should be a collaborative process where both teachers and students take an active role in the task";
"To enhance student learning I provide relevant and real life connections between the information taught and its impact on society, and actual examples of such content."

Task of teaching

"Teacher is not a provider of knowledge like an encyclopaedia, but a facilitator of learning- stimulate their minds, get them thinking and asking questions, make things relevant and enjoyable";
"Teaching and learning are synonymous, we are always in a continual cycle of giving and taking from each other, teaching is a mutual experience of learning";
"Teachers have to be flexible and understand students have their own particular learning styles."

Regulation

Awareness

"What are we doing? Teaching or thinking? Are we filling students with information about certain areas? Or are we teaching them to think for themselves?";
"How am I as a teacher going to encourage these students to put in major effort to allow themselves to experience real success? I have noticed some students who display achievement behaviour which seems to breed more and more successes and self-esteem seems to be very strong."
Why do some students start off from an achievement base and some from a failure base?"

"What is happening to me? Has my way of thinking changed? I have only been in this course three weeks and already my way of life is undergoing a transformation. Teaching is no longer just a job, it is a way of life".

Control

Processes of planning, monitoring and evaluating are evident in the following examples.

"Plenty of opportunities for trialling strategies in classroom management. My main strategy was to give one warning, then if this was ignored write the name of the offender on the board...this method was partly effective, it required a lot of with-it-ness from me. I tried moving students who were talking which was probably most effective, except they complained and I tended to find myself in a debate. I had talkers stand up and spot someone else talking before they could sit down- this was a dreadful failure since this was used by the talkers to pick on the quite and well-behaved students."

"I need to check and if necessary explain the concept differently, I could have another student explain the information to ensure it is in the student's own words or on their level. It could also mean that the student might require explanation on a one-to-one basis"

"I thought the lesson was really boring- when they had to answer a question about southern justice, the class could have had a really good discussion about it"

"Students were more motivated to do a task when I outlined the lesson tasks and objectives on the board at the start of their lesson"

"I tried to place more importance on effort rather than outcomes- I found that students worked more consistently and on the whole the class was more focussed."

Conclusion

For most students, learning experiences in the subject, Human Development and Learning, were evaluated favourably and were considered to have contributed positively to their personal development as a learner as well as to their professional development as a teacher. In particular, the maintenance of a learning journal aided reflective and metacognitive thinking as well as providing opportunities for the reconstruction of experience. However, a small number of students found the approach to learning that was encouraged in the subject somewhat difficult to adopt and expressed negative evaluations of journal writing.
Students reported considerable change in their beliefs and knowledge relating to learning and teaching. These were expressed initially in phase 1 of the subject in naive terms, but even as early as towards the end of this phase there was an increase in theoretically-informed statements, which referred somewhat equally to declarative, procedural and conditional knowledge of learning and teaching. For the remaining phases of the subject the focus of student entries was on theoretically-informed knowledge, with an increasing emphasis on conditional knowledge, that is, students were concerned with the 'why' of such knowledge. What is important from Figure 2 is the predominance of informed over naive statements relating to learning and teaching in phase 3, and to a lesser extent, phase 5. Both phase 3 and phase 5 represent student learning at the university. As such, this provides positive support for the learning experiences presented from a constructivist perspective in the subject.

Entries in students' journals indicated deliberate attempts from the beginning of the subject to connect theoretically-informed information presented in the subject with how to apply this in their own learning and teaching. There was also some concern with how these practical experiences informed theory in phase one. Thereafter, this two-way relationship between theory and practice predominated in student comments, except for phase 3 where there was renewed interest in how to apply new theoretical knowledge presented in this phase to their teaching in the upcoming practice session in phase 4.

While students' beliefs appeared to change during the subject, one cannot claim that these changes were solely attributable to this subject. Although the learning activities and assessment items of the subject were designed specifically to facilitate constructivist approaches to learning and development of qualitative conceptions of learning, other subjects in the programme and practice teaching experiences are likely to have had some influence. Furthermore, even though students' beliefs about learning and teaching have changed and evidence of their attempts to translate these into practice is provided in their journals and in interviews of selected students reported in an earlier paper (Brownlee et al. 1996), one can only speculate whether these will persist in their teaching careers. Many educators have referred to socializing influences on neophyte teachers and their effects on teacher behaviour in the classroom (Connell, 1985; Doyle, 1977, 1979, 1986; Hargreaves, 1988; Nigris, 1988).

It could be claimed that since the journals were assessed students might have written what they thought we wanted them to say. However, the changes described in their learning journals supported changes reported in their pre- and post-subject statements relating to learning and in interviews of selected students in relation to their practice teaching experiences (Brownlee et al. 1996).

The results of this study suggest that by deliberately addressing
teacher education students' beliefs about learning and teaching in their pre-service course through designing appropriate learning activities and assessment tasks, richer and more elaborated conceptions develop which become the springboard for action in their practice teaching experiences and hopefully, their professional careers.

References


B. Dart et al., AARE-ERA Conference, Singapore 1996.