"Just tell us what to teach":

Preservice teachers thinking about teaching

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Abstract

I investigate the impact of an Australian preservice teacher education program in educational psychology designed to promote preservice teachers’ intellectual development, as described by the Perry schema of intellectual and ethical development. Relatively advanced intellectual functioning is characterised by, for example, awareness that agency is within oneself, critical and reflective thinking and judgement, tolerance of doubt and ambiguity, the capacity to build and evaluate competing legitimate theories, and a view of authorities as sources, not of Answers, but of expertise. The research includes a quasi-experimental repeated measures comparison of experimental and control groups’ scores on the Measure of Intellectual Development (MID), and analysis of questionnaire and semi-structured interview data. The results indicate that the program promotes preservice teachers’ intellectual development as manifested in movement away from dualistic and absolutist thinking, increasing realisation of self-agency and the value of supporting learners’ autonomy, and enhanced critical and reflective thinking.

Introduction

"Well, you asked us 'What is 'normal'?' If there are lots and lots of things all similar, then you can ask the question 'Is this one normal?' But if there's only one of a kind, you know, it's kind of unique, then you can't ask whether it's normal, can you? I mean, there's only one. Take possums, for example...." The well-meaning teacher listened to the Year-three boy with kindly and interested attention, but despite his clear explanations, she did not appear to understand his struggle to come to grips with the concept of normality, and did not respond to him in any meaningful way.

(Author's observation, primary school classroom 1998.)

In this article I describe a teacher education program in educational psychology at an Australian university and its success in promoting primary and secondary preservice teachers’ intellectual functioning in terms of developing their critical and reflective judgement, tolerance of doubt, ambiguity, and complexity, awareness of self-agency, and so forth. The findings are relevant to teacher educators generally because the intellectual functioning of
Preservice teachers is a determining factor in the quality of their learning and teaching in all areas. Programs resulting in gains in intellectual functioning are significant because traditional instruction rarely achieves such gains (Shearn & Davidson, 1989).

In visiting perhaps 100 primary classrooms over more than a decade in Australia, I have witnessed innumerable interactions between teachers and children in which the teacher appears not to have grasped the meaning or consequence of a child's intellectual offering. I speak not of the inevitable moments when distraction or preoccupation interferes with a teacher's ability to listen and respond adequately to a child, nor of situations when the child's meaning is unclear, but of interactions in which a child's expression of thinking is clear, unambiguous, and significant, yet falls into the void, uncomprehended, unacknowledged, and unused. That particular opportunity to engage the child in further learning is lost. In the short term, the child may not appreciate his or her own achievement; in the longer term the child may question whether the effort required to engage intellectually with a teacher is worthwhile. I do not believe that these teachers deliberately neglect children's interests. We do not educate our teachers to engage with children intellectually. Like Splitter and Sharp (1995, p. 65), I distinguish between schooling and education. Unlike education, schooling is not renowned for its attention to inculcating reflective and critical thinking and judgement in its learners. Most teachers, I hazard, are more schooled than educated. Consequently, most are not practiced at joining in thoughtful dialogue about substantive issues. Sadly, many appear disinclined toward it. Schooling has left its mark.

Intellectual development is a journey requiring effort; it is not an inherent gift one does or does not possess. One chooses whether or not to embark on the journey and applies one's intelligence, among many other personal qualities, to the journeying. Teachers must embark on that journey with reclaimed intrepidity and gusto if they are to meet their learners in genuine intellectual endeavour. If we want teachers to be educators then we must educate them. We must provide them with opportunities, support, and challenge to become reflective, critical, and creative thinkers, to grow intellectually, to engage in a process of constant transformation.

I use the term intellectual development to mean that process of adult post-formal-operational development theorists including Perry (1981); Belenky, Clinchy, Goldberger and Tarule (1986); King and Kitchener (1994); Baxter Magolda (1992); and Kuhn (1991) describe. The phenomenological research of Perry and others gave rise to models presenting a complex picture of adult epistemological development. Although these models differ in matters of emphasis—on gender issues, for example—substantial commonalities exist between them.

The above developmental models describe adult intellectual development as a process of growth from a state of relative psychological rigidity towards increasing flexibility. Perry (1988) describes adult intellectual development as a "visible, even explicit broadening of the mind" (p. 150). It is a reorganisation of intellectual structures stimulated by cognitive disequilibrium resulting in increasing awareness, comprehension, and ability to deal with the complexities, uncertainties, and ambiguities of one's intellectual and social life (Hofer & Pintrich, 1997).

Although there is a substantial body of work concerning reflective teaching (e.g., Schon, 1991), there are relatively few attempts to explore and monitor intervention programs designed to enhance reflective and critical thinking among preservice teachers. In evaluating the impact of one such program, the present research constitutes a useful contribution to the field. The research also is important because teacher educators must develop programs which enhance the cognitive functioning of preservice teachers.
The teacher education program I describe stimulates intellectual growth in preservice teachers, in particular their proclivity towards supporting learners’ autonomy, by providing the “ingenious blend of support and challenge” Perry and others describe fostering intellectual development (Kegan, 1994, p. 42). A teacher’s motivating style may be identified on a continuum from "highly controlling" to "highly autonomy-supportive". Controlling teachers essentially aim to control learners' goals and behaviours toward teacher-prescribed ends; autonomy-supportive teachers on the other hand aim to strengthen each learner's sense of individual agency, helping learners set and pursue their own agendas. Autonomy-supportive teachers promote learners' intrinsic motivation, initiative, self-discipline, capacity to think and judge for themselves, and meaningful participation in classroom decision-making. Learners benefit markedly from autonomy-supportive teaching, demonstrating higher academic performance, higher mastery and intrinsic motivation, greater conceptual understanding and creativity, preference for optimal challenge, positive emotionality, and lower drop-out rates than learners taught by controlling teachers (Reeve, 1998).

Pedagogical approaches associated with higher levels of intellectual functioning that foster reflective judgement and tolerance of uncertainty, democratic leadership, and autonomy-supportive style are not learned easily. For many teachers, schooled and trained in authority-centred, control-oriented institutions, these are unfamiliar and difficult notions. Even when teachers value these ideas, implementing them is often difficult. The notions are practised minimally in mainstream schooling, and autonomy-supportive teachers may face a lack of collegial support, even resistance and hostility. Also, intellectual growth is a process of accommodating to new ideas, a process of ongoing conceptual change, and accommodation generally is a difficult, even psychologically painful process.

A critical review of research findings in teacher education (Wideen, Mayer-Smith & Moon, 1998) reinforces the commonly held view that many teacher education programs barely scratch the surface of preservice teachers' entrenched beliefs. Teacher educators must find ways of encouraging preservice teachers to encounter, engage with, practice, reflect on, value, and commit to new ideas such as autonomy-supportive approaches despite reluctance to relinquish the familiar and comfortable. Conceptual change theory throws some light on the problem. Strike and Posner's (1992) revised theory of conceptual change is largely epistemological in nature, is concerned with the parameters of rational belief, and accepts the notion of a conceptual ecology as a basis for investigating learners' beliefs. Influenced partly by sociocultural and situated cognition traditions, the theory sees learners' beliefs as historically and culturally conditioned and significantly influenced by social and motivational factors. The theory posits the following set of necessary and sufficient conditions for change. Before learners will commit time and energy to change, they must be aware of and dissatisfied with their current ideas and see that the new idea is intelligible and plausible and that taking it on is a fruitful proposition. In other words, before accepting that change is necessary, learners need to first have lost faith in the capacity of their current notions to solve their current problems; second, be able to understand the new ideas; third, believe that the new ideas will solve the problem; and fourth, feel that it is worthwhile to put time and effort into learning the new ideas. Reeve (1998) shows that the autonomy-supportive teaching style is teachable, but that its plausibility and applicability must be demonstrated clearly if control-oriented teachers are to accommodate the information.

Strike and Posner's (1992) theory posits a set of necessary and sufficient conditions for change; it does not purport to prescribe methods by which the conditions might be established. Acknowledgement of relevant cognitive, motivational, and sociocultural factors must underpin such methods. What might it take, for example, for preservice teachers to lose faith in their current pedagogical notions? What might it take for them to find unfamiliar and complex ideas plausible and fruitful? Why should they value and practice approaches which demand a great deal of thought and effort, particularly initially? This study connects
revised conceptual change theory with an instructional model which incorporates such factors, and aims to promote learners' intellectual development via a blend of challenge and support. I describe these links in the next section after a brief overview of the Perry schema and the present educational psychology program.

The Perry schema of intellectual and ethical development emerged from William Perry's phenomenological research into students' beliefs about learning and knowledge, and the meanings they made of their educational experiences (Perry, 1981, 1988). Perry posited a schema consisting of nine positions within four major categories: Dualism (Positions 1-2), Multiplicity (3-4), Contextual relativism (5-6), and Commitment within relativism (7-9) (Moore, 1994).

According to the schema, persons operating from a dualistic perspective tend to view knowledge as a set of Absolute Truths held exclusively by Authorities. Persons functioning at the higher levels are less prone to dualistic and absolutist thinking, accept that agency is within themselves and that they are responsible for their own decisions and behaviour, and bring analytical and critical thought to their judgements. From positions two to five, characteristic thinking about learning is as follows: At position two learners tend to focus on what to learn (i.e., Right answers), thinking tends to be dualistic and rule-driven, and agency is seen as external (i.e., vested in Authorities). At position three the focus shifts to how to learn (i.e., how to find Right answers), thinking is multiplistic and focused on relevance. At position four, thinking is still multiplistic but the focus is on how to think independently. At position five, thinking is relativistic and one learns how to judge, that is how to think in context, weigh alternatives, and seek adequate solutions based on evidence. Agency is seen as internal (Moore & Taylor, 1991).

Examining the schema's relevance for today's educators, Moore (1994) locates Perry's research within a developmental psychological framework. Although the Perry schema generally is interpreted and criticised as a post-Piagetian model of adult intellectual development, Perry does not claim that the schema represents a formal or universal developmental sequence, and the schema should not be interpreted as a rigid stage model. For the purposes of the present study, the Perry positions are assumed to indicate only roughly the levels of students' cognitive functioning in limited aspects. According to Moore, recent factor analyses suggest an alternative perspective on the schema, that is, that it reflects several related dimensions—dualistic and absolutist thinking, issues of personal agency, and critical thinking being the main three factors.

The program

The present program is an experimental version of the educational psychology tutorials in the teacher education courses at an Australian university. The 16-week program addresses theories of learning, intelligence, cognitive development, personality, psychosocial development, and pedagogy. Henceforth I use the term "program" to refer to the experimental version of the tutorials, and "students" to refer to the primary and secondary preservice teachers participating in the program. Students attend a school each week for a two-hour tutorial which incorporates the philosophical community of inquiry approach to discussing problematic issues within educational psychology. For a third hour each week, supervised by their university tutor, students teach philosophy to groups of 15 primary or secondary school students using the community of inquiry approach. Splitter and Sharp (1995) describe the community of inquiry as a cooperative attempt by a group to inquire into problematic issues to create deeper meanings and enable informed judgments. Through its emphasis on dialogue, the community of inquiry encourages its members to become more analytical, reflective, critical, and articulate, to offer their opinions and reasons with clarity and goodwill, and to progress towards making sound judgements. The community of inquiry
puts inquiry itself at the heart of the educational process. Asking one's own questions and pursuing answers is a highly effective way of learning; that learning is often amplified and extended when it occurs within a community of learners similarly motivated to inquire into the problematic issues at hand.

In the program community of inquiry students tackle difficult and contentious issues in educational psychology and begin to understand that the aim of inquiry is to further understanding and create meaning in a world of conflicting perspectives and interpretations. From the tutorial material the group formulates questions to be addressed in the inquiry, for example, “to what degree should children participate in classroom decision-making?” Students articulate, analyse, and defend their opinions, and take personal responsibility for learning. They also must meet the challenge of implementing the community of inquiry with their own learners using philosophical material.

The program is designed in accordance with the Developmental Instruction Model (Moore & Taylor, 1991) based on the Perry schema, and aims to promote students' intellectual development via a blend of challenge and support. Four key variables in the Developmental Instruction Model—diversity, experiential learning, personalism, and structure—respectively represent the number and complexity of perspectives offered, the degree of active personal involvement in learning, the degree of cooperation, risk-taking, and critical and evaluative discussion, and the degree of direction given. These variables are present in any university program, but if not deliberately organised according to students' developmental needs, they may have a neutral or even detrimental effect. Too much structure, for example, can be stifling; too little structure or too much diversity may provoke anxiety. For learners operating at position three, high degrees of experiential learning and personalism and a moderate degree of structure provide support, whereas a high degree of diversity provides challenge.

An earlier study (Hill, 1997) had revealed that the four Perry variables contribute to the establishment of the four conditions for conceptual change. The three support variables tend to establish three of the four conditions for conceptual change—intelligibility, plausibility, and fruitfulness—whereas the provision of diverse pedagogical contexts, philosophies, and methods provokes the fourth—dissatisfaction with existing levels of knowledge and understanding (Hill, 1997). The program is designed to encourage students operating at position three to progress towards adopting position-four or position-five perspectives. Fours value self-expression, independent learning, and autonomy-supportive teaching styles, and Fives value the notion of a community of inquiry as a shared way of questioning, building, and evaluating alternative theories, analysing issues, and exploring values (Moore & Taylor, 1991).

The program is based in primary and secondary schools so that students consistently link theory and practice and reflect on the outcomes in an on-going cycle of theory, practice, and reflection. The high degree of personalism in the program encourages students to support each other in asking questions, taking risks, and voicing opinions. The program challenges designed to foster intellectual development in Threes include the community of inquiry format, the diversity of perspectives and choices offered in the program, an emphasis on independent learning, autonomy-supportive approaches, and the opportunity to collaborate with peers and tutor.

The program includes multiple and often conflicting perspectives on pedagogical issues. I encourage students to appreciate their own understandings and opinions of the theories presented; how they experience the theories in practice; the need to refer to context and personal values when evaluating and making decisions; and that effective teaching-learning relationships are collaborative rather than authority driven. Students have substantial choice regarding assessment topics and material for teaching, and many experience this as a
considerable challenge. The community of inquiry also presents the challenging notion of teacher and students participating on an equal footing. Threes tend to feel more comfortable with the notion of teacher as Authority than teacher as co-inquirer and source of expertise. Each week the students are exposed to this challenge both as learners and as teachers collaborating in a community of inquiry with their learners.

The community of inquiry requires an autonomy-supportive approach to class management and discipline, another challenge for Threes who tend towards controlling rather than autonomy-supportive styles. In summary, the program provides opportunities for students to engage in a continuing process of theorising, practising, and reflecting on the immediate outcomes, and to undergo powerful emotional and intellectual challenges within a supportive context. The aim is to bring about the four conditions for accommodatory change in order to encourage students to value and adopt position-four or position-five perspectives. Only if students value these perspectives will they form a commitment to acting according to them. Only if they find the approaches worthwhile will they be enduring.

Research design

The research questions are: "what is the nature of the impact, if any, of the program on students’ intellectual development?" and "will students’ participation in the program result in a significant increase in their intellectual growth compared with that of the control group?" The participants are 57 undergraduate and 62 postgraduate students enrolled in the educational psychology subject. The undergraduates are in the third year of a four-year course; the postgraduates, the final year of a two-year course. Of the sample, three-quarters are women and 90% report English as their first language. Three-quarters of the undergraduates are under 25 years of age. Half the postgraduates are under 25; another 40% are between 25 and 30. 59 students attend the experimental program, and 60 serve as the control group. The program is similar to the control course in duration, content, and assessment but is organised according to the Developmental Instruction Model. The four tutors who teach the students in the control group are not involved in the research project.

I analysed the qualitative and quantitative data from questionnaires, semi-structured interviews, and the Measure of Intellectual Development (MID) that I describe below. A colleague not involved in the research validated my categorisation of the interview data. The repeated measures design is quasi-experimental because university constraints preclude random selection and assignment of participants; the students enter the experimental and control tutorials depending on their university timetable and personal preferences. I address the relevant problems of this design in the results section. During the final weeks of the program, I collected responses to a questionnaire investigating students’ experiences of the program and audio-taped one-hour semi-structured interviews with a representative sample of 11 students from the program. The questionnaire and interview questions probe students' experiences of the program and self-reported changes, if any, in their views about learning. The questionnaire items are: "what is the most important thing you have learnt from [the program] and what effect, if any, has [the program] had on your ideas about what constitutes an ideal learning situation?" and "please offer any suggestions for improvements in tutorials. The interview question is: "in what ways, if any, are your ideas about what is a good learning experience for you changing, and what effect, if any, has the [program] had on those ideas (describing both negative and positive experiences)?"

The program focuses on many educational issues apart from intellectual development; students are unaware of the main research focus. This reduces—at least partially—the likelihood of students responding to the questionnaire and interview items with what they think I want to hear. Because of their experiences in the community of inquiry, most students seem prepared to disagree openly with me on educational issues without fear of being
penalised. Finally, questionnaire and interview items are open-ended, the questionnaire elicits spontaneous responses rather than choices among given responses. I ask students to describe both negative and positive experiences. The participants complete the MID and questionnaire anonymously.

Prior to the beginning of the program in March 1998, I administered the MID pretest to the participants. Posttests were completed in August 1998. The MID pretest asks respondents to describe a course of study they enjoyed in the past; the posttest, an ideal course. I told participants I was gathering data to report on their learning preferences; I did not tell them I also would be using the MID as a measure of their intellectual functioning because this knowledge might have influenced their responses and undermined the validity of the research. I compare differences between pre- and post- scores from the control and experimental groups using one-tailed t-test analysis.

The MID is a validated essay-format instrument designed to reflect respondents' underlying cognitive structures relative to positions two to five on the Perry scale (Moore, 1988). In the interests of brevity I describe students assessed as operating at position three as threes, for example. Relative to interviews, the MID is a conservative indicator (Moore, 1998), and I return to this issue in the findings section. Accredited raters assign the MID scores according to the following structure. Students rated as functioning at position 2, for example, usually are assigned one of three common scores: 222 indicating a stable position 2 perspective; 223 indicating a dominant position 2 opening to position 3; and 233 indicating a dominant position 3 with a trailing position 2. In the present study, students' scores are converted for use as continuous data as suggested by Moore (1991): for example, 222 = 2.0; 223 = 2.33; 233 = 2.67.

Results and discussion

The data in Table 1 summarise students' spontaneous responses to the questionnaire item regarding the effect of the program on their ideas about what constitutes an ideal learning situation. Three distinct themes emerge which I categorise as: Autonomy-support; Personal agency; and Teaching approaches. The latter category includes a small number of nondescript responses.

Table 1

Students' Spontaneous Responses about the Effects of the Program on their Pedagogical Views (Percentages of Total Responses; N = 52)

<table>
<thead>
<tr>
<th>Autonomy-support</th>
<th>Responses here indicate increasingly autonomy-supportive pedagogical views, e.g:</th>
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<tr>
<td>50%</td>
<td>*My ideas were for absolute control and respect; I now realise that if the students have a certain amount of freedom the class works better;</td>
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<td></td>
<td>*It is really valuable to allow students to have choice about their learning;</td>
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<td></td>
<td>*All students have a right to voice ideas;</td>
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<tr>
<td></td>
<td>*I'd like to be able to encourage dialectical thinking;</td>
</tr>
<tr>
<td></td>
<td>*Democracy, MAN, democracy!!</td>
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Half of the respondents spontaneously report a shift toward more autonomy-supportive approaches. Such a shift signifies movement away from an Authority-centred, controlling notion of pedagogy to a more flexible, democratic outlook. 24% of respondents report an increased sense of personal agency. These responses are characterised by growing commitment to thinking for oneself and making decisions based on personal judgements rather than on rules laid down by Authorities. Many of the remaining respondents emphasise their discovery of pedagogical methods such as the community of inquiry and democratic classroom management. Students’ reporting of this effect may also indicate a shift toward more autonomy-supportive views, but I cannot assume this is the case. Nevertheless, three-quarters or more of the responses suggest some movement towards higher level perspectives.

55% offer no response to the item asking for suggestions for improvements to the tutorials. The otherwise positive response from this 55% suggests that the lack of response is not due to indifference or hostility, but a question about negative reactions may have yielded more useful data. Nine responses (17%) I categorise as “Desire for more structure”—for example, More handouts; More overheads; More time to copy overheads; More discussion of assessment requirements. These responses indicate a desire on the part of these students for more structure in the form of more focused information, particularly regarding assessment. This is not surprising given that most students have become accustomed to and have achieved success via transmission modes of teaching and learning in the past. Regarding other categorisable data, no more than three responses fall into any one category. Three responses are teaching-related, for example, a request for me to talk more about my teaching experiences in schools, three complain that discussions are sometimes
too long, and three express frustration with peer side-talking. Overall, the responses to the questionnaire item suggest relative satisfaction with the program, but also that a substantial minority of students want more information, particularly regarding assessment requirements. I believe it is possible to provide this kind of support without compromising the program aims, but it is also important not to do students' thinking for them.

Following are pertinent extracts from the interview data given by 11 interviewees in response to the following question: "in what ways, if any, are your ideas about what is a good learning experience for you changing, and what effect, if any, has the school-based tutorial had on those ideas (describing both negative and positive experiences)? I select the excerpts to demonstrate the essence of the interviewees' perceptions and categorise the data according to the three Perry dimensions described earlier:

* Dualistic and absolutist thinking: appreciation of complexity; eschewing of dualistic and absolutist thinking; appreciation of the legitimacy of diverse persectives; tolerance of uncertainty and ambiguity, and so forth.

* Issues of personal agency: acknowledgment of personal agency and of the need to establish criteria for making personal judgements; appreciation of the collaborative nature of the teaching-learning process; interest and confidence in thinking for oneself; taking personal initiative and responsibility for learning, and so forth.

* Critical and reflective thinking

Perry dimension: Dualistic and absolutist thinking.

Nine interviewees indicated that their experiences in the program facilitated or reinforced their increasing appreciation of the complexity of many pedagogical issues. Comments such as the following indicate their development away from dualistic and absolutist positions: "I don't think I had that complexity of analysis before". The community of inquiry acts as a crucible for ideas—diverse opinions are discussed and more complex understandings emerge—and is thereby likely to promote complexity of thought.

Interviewee 1:

I think the differences in my thinking are really about not making such blanket statements about things. I think that almost all the methods that are out there have their place and value and purpose, it's choosing when and where. I don't think I had that sort of complexity of analysis before.

Interviewee 5

What I find interesting is the amount of chalk and talk that occurs in our classroom. In a sense I always thought it was an either-or, and I've come to realise that it's not, that essentially it is a good way of teaching, but it can't be the only way. So instead of trying constantly to fit into one mould, you really should just go with what feels right for that particular situation.

Interviewee 7

You've got to step out of that comfort zone to be able to move forward. I'm trying to work towards that idea of being the leader rather than the boss. The reason that my opinions and views and philosophies have changed is that I've been given the
opportunity to think about things in a much broader context. Now I realise that I can provide the opportunities for them, but I don't have to know everything. And that's a big relief. [Teaching philosophy for children] makes you realise that there is no right and wrong and that you just do the best you can with the situation you've got.

Educators expect adult students to analyse and criticise competing theoretical perspectives and methods. Twos and Threes meet such expectations often with shock and dismay. Whether students advance or retreat in the face of the challenge is influenced significantly by how well educators support them in their attempts to make sense of this new terrain. Our recognition and acknowledgement of their struggle may make an important difference. Future challenges may cause interviewee 7 to re-examine her statement: "There is no right and wrong", and to realise that there are a few clear strokes of black and white among the grey. Interviewees 9 and 11 comment on the way the community of inquiry approach dissolves the traditional divide between teacher and learner:

Interviewee 9

Because the community of inquiry tends to informalise teaching, you cease to become the teacher and you're just a participant in the conversation. They are forced to think about issues and think about thinking.

Interviewee 11

Within the class we were questioning values as well, we were questioning very individual, almost moral issues when it came to teaching. I think it's hard to design it beforehand to fit the way you want it to. If anything like this is going to be effective you have to tailor it with that freedom in mind. It's like exercising a way of being more than anything else. I think that it's a powerful place for students to be.

Although breaking down traditional divisions can enhance the autonomy of both teacher and learner, it also brings uncertainty. Yes, it is a powerful place, but also a vulnerable one. In the following quotations, interviewees 6, 8, and 4 describe their increasing openness to new ways of thinking, the discomfort of the ambiguity that accompanies the puzzling, and the exhilaration experienced when some new pieces fall into place with the formation of deeper connections and understandings. Comments from nine interviewees signify that broadening of the mind of which Perry speaks, the deepening of perspective, and the process of opening up to new ways of thinking.

Interviewee 6:

Maybe before I was so driven by my own way of thinking, whereas now I'm thinking "I have my own opinion and that's justified, but I can still listen to everybody else's and that can change my thinking". Has anything happened [in the tutorial] where you've thought: "That's different from how I think"? I find that I'm thinking like that all the time. I'm quite exhausted at the end of the day.

Interviewee 8

It's a great feeling—that feeling of connecting is really a positive experience. So for me that's my ultimate learning experiences; when those connections are made and you can feel a piece go in the jigsaw puzzle and you just feel your perspective alters and becomes broadened and deepened. That, for me, is learning. It's a definite feeling.
Interviewee 4

You're urging the students on to think through things. There's a bit of a dilemma here, two things they need to weigh up, is questioning what's going on in the class and what the material is, and also trusting in the teacher [to take] the students in a particular direction which is hopefully the goal that they want. There's been a fundamental realignment of my thoughts of what a teacher was. My concept has become more pointed and more understanding. I've just done an essay: it's definitely broadened my horizons to consider that there are alternatives. Take the most closed view of things—that there is no alternative to how I've been educated myself. There's just so many more alternatives. Instead of just assuming that the children are going to understand what we're talking about, it was clear [to me] that at points they needed to have a different point of view of things. It's something within me that's challenged me during this last year and a half, how my delivery to the students and how the students can interact with each other can change as well.

Weighing up alternatives, managing dilemmas, thinking to the point of exhaustion—something is going on here. Both challenge and support are required for students to put in the effort required to develop intellectually. The benefits speak for themselves and encourage students to face new challenges.

Perry dimension: Sense of personal agency

Nine interviewees highlight their valuing of collaboration and negotiation with their peers and tutor and/or a growing sense of personal ownership and regard for the legitimacy of their own understandings. They realise that agency is within themselves, that their ideas and experiences matter, and that they are all grist for learning. The community of inquiry fosters the expression of opinion, and in so doing, the hearing of one's own opinions and how others respond. Those opinions, for good or ill, are available for comparison and contrast with others. One begins to understand what and how and why one thinks and to recognise how this drives one's practice.

Interviewee 1

At the moment I'm thinking a lot about empowerment in that community [of inquiry]. Empowerment in the community I take to mean negotiation of everything. So I have thought about myself as a learner being able to participate in influencing the environment in which I'm learning as it's happening and how I'm interacting with the tutor to help that be a better experience for me.

Interviewee 4

I'm realising that I need to become more responsible, in the sense of being responsible to the class isn't doing these last minute preparations. And it's not being responsible to myself either because I'm failing myself. I'm also definitely not providing the students with as much as they could get. This whole thing to be responsible is also reflected elsewhere within my life.

Interviewee 6:

I've really been able to start to own what I'm writing. I had to do [an] assignment and I read it and I thought [to myself] "Wow, that is really yours, that's just you in that paper". I probably feel more like an adult than I ever have, going through this course.
Interviewee 7

I felt that I could virtually say whatever I liked. Even though the whole class might have disagreed with you, it was a very safe environment to be able to discuss. We were discussing issues that are fairly full-on. That's why the essay was really valuable for me because I was able to locate my own views within some sort of theoretical context.

A maturing of mind seems to be occurring here, including a growing realisation that agency and responsibility for one's learning and development is within oneself.

**Perry dimension: Reflective and critical thinking**

The following responses highlight the interviewees' increasing use of metacognitive processes—critical analysis, reflection on practice, and questioning and clarification of pedagogical beliefs and how they arise in practice. There are difficulties and discomfort associated with such growth, but also hints of the intellectual exhilaration experienced. The community of inquiry forces participants to think and to question their and others' taken-for-granted assumptions. In response, they can either retreat or move forward, but things cannot remain as they were.

Interviewee 1

I'm changing more as a learner than as a teacher because if I'm teaching I've got to be a good learner. To me an essential part of critical thinking is being able to think about how to think, because it's all these internal 'What If' scenarios that go on, playing epistemic games so that you can develop your understandings or critique your knowledge.

Interviewee 7

I really think about things a lot more now. I put myself in the position of how I would prefer to learn that, and how can I own it myself and make it far more relevant? [Now I] make [my] own informed decisions. I think I've been given the ability to make those informed decisions by having the opportunity to think for myself.

Interviewee 9

[The tutorial] brought to my attention what I'm not doing and what I need to change. Now I understand you need to construct [the curriculum] so that people can build their knowledge. So it's back to the community of inquiry. It's got me thinking about thinking which has been great.

Five interviewees spoke of discovering a controlling tendency in their teaching—a tendency hitherto unrecognised as problematic. For example:

Interviewee 3

The very time spent thinking about perhaps there are different ways people learn is very necessary for me. It's very uncomfortable for me to find how hard it is to unlearn the jug and mug. It's really drenched into me.

Interviewee 8
I've discovered a tendency in myself to probably want to control, which I need to let go of a bit. It's got to do with being a bit passionate about your subject area and wanting people to understand something. And maybe [the children] don't want to go that way. I'm learning to let go and go with them. That's the thing, is understanding them.

Interviewee 5

I've come to examine more, this year particularly, what I do. If I go on thinking that child is totally unacceptable, I immediately leap into the power struggle situation. Now I can think in a more remote way and think "How can I enable them to participate in the class in a way that isn't destructive to the class or to their learning?" I tend then to develop a respect for where they're at instead of thinking they're a total waste of time.

Interviewee 10 describes the inadequacy of his former laissez-faire model of teaching and his need to develop an assertiveness which is simultaneously respectful of learners and of himself.

Interviewee 10

They're hard to do—taking these lessons with these students. I realise how inexperienced I was as a teacher. I mean I walked in and I thought I'd be able to teach in some great way and be cool for kids and everything would be fine, but I've found now that I can't. I've got to be more assertive.

Issues of letting go of control versus asserting more control at first glance may appear in opposition, but in fact they comprise two faces of one coin. To be a democratic teacher means to foster one's own autonomy as well as that of learners. Teachers must be assertive in fostering the goals of education, and must relinquish counterproductive notions about controlling others. Teachers have a responsibility to educate and to protect their learners' right to learn. Learners who feel respected, recognised, and protected are more cooperative and show less resistance to taking responsibility for their own learning. Students see both sides of the coin each week as they engage as both participants and leaders in the community of inquiry and the education process. Given appropriate support and time to reflect on their endeavours, students may deepen their understanding of the democratic balance achieved in a well functioning educational community. In the following quotation, interviewee 4 speaks of his struggle to bring his practice in line with his intentions. Considerable critical and reflective capacity is essential if one wants to practise in ways consistent with one's pedagogical theories.

Interviewee 4

I think there's a noticeable difference between [my] intentions [and my practice]. This is the benefit of the school-based thing, is actually finding out how my intention actually arises in a class, how it's actually portrayed, and comes out in actions. And it's amazing trying to make these two things compatible and get them together, it's a tough call.

In summary, the interview data provide insight into the nature of the interviewees' experiences of the program and their perceptions of changes wrought at least partly as a result of those experiences. Nine of the eleven interviewees spontaneously report increased appreciation of the complexity of the issues they confront in the program. They also report a growing sense of self-agency and of becoming more critical and reflective in their thinking.
The overall MID prescore mean was 3 (range 2.33 to 4), with the majority of students operating around Perry position three. t-test analysis revealed a statistically significant increase in intellectual growth of the experimental group compared with that of the control group \((t(64) = 5.79; p< .0005)\). The mean for the experimental group \((n=39)\) increased \((pre-M=2.9; post-M=3.4)\) whereas the mean for the control group \((n=27)\) remained relatively stable \((pre-M=3; post-M=2.9)\). Generally, little development takes place even during several years of university education \((Hofer & Pintrich, 1997)\), so the half-position increase indicated in the experimental group is important. Ratings of interview material from at least five interviewees indicate higher levels of functioning than levels indicated by their MID ratings. These disparities might be explained by the fact that the MID is a conservative indicator compared with interview data \((Moore, 1998)\). Ratings of interview transcripts suggest that at least five interviewees are operating around position four/five or even beyond, but the MID ratings indicate only two at a stable position four or beyond, and four at a dominant position four \((344)\).

Another unresolved issue is whether many students may be driven to such an extent by their legitimate and strongly felt need for teaching experience that their level three needs dominate. Students' MID scores reflect their focus on experiential needs, perhaps outweighing (in quantity and quality) their references to higher level issues.

I must mention two other problems. Timetable-related student transfers between the program and the control group may have weakened the between-groups difference, because some students categorised as belonging to the control group received some intervention and some students categorised as belonging to the experimental group received less than optimal intervention. Students' questionnaire information regarding their attendance record in the program enabled me to withdraw from analysis data from some of the students who transferred, but because of the ethical requirement for anonymity this process was incomplete. This problem can lead to a Type II error, that is, concluding that the intervention has no effect when in fact it does, but because the problem cannot result in the between-groups difference being strengthened, it cannot lead to the more serious Type I error, that is, concluding that there is an effect from the intervention when there is not.

Second, student error in using a 4-letter codename on pre- and post-essays resulted in my excluding a portion of the data from analysis.

The experimental hypothesis is that the observed increase in intellectual growth is a result of students' participation in the program. Neither maturation nor exposure of the control group to a traditional program resulted in increased ratings of intellectual functioning. The prescore means for the experimental group and control group do not differ significantly, but because random assignment of participants was precluded, I cannot rule out the possibility that the observed intellectual growth within the experimental group is due to a pre-existing disposition towards growth, perhaps through characteristics such as the desire to accept intellectual challenge.

It has been argued that the process labelled as developmental by the Perry schema may be no more than a process of socialisation into the Western liberal education tradition \((Moore, 1994, p. 57)\). Moore argues that even if the process is more one of socialisation than developmental—and perhaps these factors are inextricably linked—it is no less helpful in understanding students' learning processes within our notion of what constitutes good outcomes of higher education. The present program, for example, aims to foster students' adoption of the epistemological and pedagogical attitudes associated with higher levels of the Perry schema. These attitudes also are espoused as desired outcomes of higher education. Are the outcomes described in this paper a result of students' accelerated intellectual development or have the students merely absorbed the new notions—the value of autonomy-supportive and relativistic pedagogical stances, for example? There is nothing
to suggest that the changes reported by students are superficial or transitory. Of course, the test of this assertion will be whether students continue to value and practise these new approaches as beginning teachers. However interpreted, the outcomes of this study indicate students’ adoption of more complex, less absolutist pedagogical attitudes and understandings. By re-interviewing the interviewees over a few years as they embark on their teaching careers, I will address the question of how enduring these attitudes are.

Conclusions

The results indicate that students' participation in the program enhances their intellectual growth. The observed significant increase in intellectual growth in the experimental group may be due to a pre-existing disposition towards growth, but even if the students in the program are thus predisposed, this growth is more likely to occur in a conducive context. The control group showed no gain in Perry level. Students' self-reporting of the impact of the program on their pedagogical views suggests that at least 74% moved towards an increased awareness of the value of autonomy-supportive approaches or an increased sense of personal agency, both indicators of intellectual growth. The interview data support these findings, and offer considerable insight into the nature of these changes, and the accompanying delights and difficulties of meeting the intellectual challenges entailed. The findings are relevant to a current and hotly debated issue in teacher education. University-based teacher education is under fire from several directions. Government bodies and preservice teachers express disaffection about what they perceive to be overly theoretical approaches, inadequate focus on the development of teaching competencies, and insufficient relevance of university-based teacher education. In response to such complaints, governments may argue in favour of returning to apprenticeship models of teacher training. In the present program, students teach in schools each week for the duration of the academic year and thereby the program addresses and seeks to overcome the abovementioned problems. Although the program does resolve these issues, importantly it also maintains an essential focus on the development of students’ reflective and critical capacities and their understanding of the broader pedagogical picture. The program’s emphasis on teaching experience is essential to support students, but experience alone will not challenge level three functioning. As several researchers have observed (Johnston, 1994), experience of itself does not lead inevitably to learning, nor to reflection, nor to improved practice.

The present program is a unique opportunity for students to put pedagogical theory into practice immediately and reflect on outcomes. An unresolved question is whether many students are driven to such an extent by their legitimate and strongly felt need for teaching experience that their level three needs dominate. Preservice teachers’ focus on experiential needs might add to the difficulties of making accurate judgements regarding levels of intellectual functioning according to the Perry schema. The results of this research indicate that, as long as students have the opportunity to engage in consistent, albeit brief, periods of meaningful teaching practice within a challenging, supportive, and reflective context, they will be willing to be more intellectually adventurous. Teacher educators have a crucial role to play in provoking critical thought, enhancing preservice teachers’ reflection on their experiences, and encouraging them to confront the difficulties that inevitably accompany experimentation with unfamiliar teaching approaches.

The results of this study indicate changes in students’ pedagogical attitudes traditionally resistant to change (e.g., Reeve, 1998). Such attitudes and underlying beliefs are complex, subtle, and multi-faceted. Only an intervention process of similar order of complexity is likely to succeed. Intellectual growth in the form of increasing understanding of, and ability to deal with, complexity, uncertainty, and ambiguity is more likely to occur in contexts which allow students to experience powerful emotional and intellectual challenges within a supportive
context, and to engage in a continuing cycle in which meaningful practice is built upon theory and is reflected upon with peers and university tutor within a critical framework. In such contexts, the combination of support and challenge is more likely to foster the conditions for conceptual change, leading to a valuing of the new ideas and manifested in improved practice. With increased use of online teaching, teacher educators must not lose sight of the potential of face-to-face encounter to bring about significant attitudinal change. The community of inquiry appears to be a particularly powerful form of group dialogue with significant potential for achieving change. In the cut and thrust of face-to-face dialogue, views are challenged, alternatives recognised, and minds are changed.

What might flow from students’ increased awareness and understandings? As teachers, perhaps they will be better prepared to support learners’ autonomy, listen to them with respect and informed attention, recognise their intellectual endeavours, and respond by offering appreciation and further challenge, thereby engaging learners in an intellectual cycle of creative and clear thought, reflection, critical appraisal, and refinement of ideas. Similarly I hope they will direct their beam of critical appraisal onto our schooling system itself.


realities of diverse students and a changing society. San Francisco: Jossey Bass.


