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Terence Lovat
University of Newcastle

Margaret Davies
University of Newcastle

Ronald Plotnikoff
University of Newcastle

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Ronald Plotnikoff

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ABSTRACT

For most of this century, and increasingly in modern times, teacher educators have been impelled to consider ways in which a greater level of reflectivity, especially through enhancing research skills development, might be integrated into the teacher education program. The paper reviews the recent history of such attempts, pointing to the relative paucity of experimentation designed to implement such components in teacher education. It then describes a longitudinal study designed to effect, and evaluate the effects of, one program of research skills integration in preservice teacher education.

Reflectivity and Research Skills Development

The goal of producing reflective, inquiry-oriented researcher teachers is not a new one. Indeed, Tom (1985) traced the notion to the turn of the century. In recent times, there has been no shortage of conceptual plans for developing reflectivity and a research-orientation in vocational training programs in teaching and allied professions (Kolb, 1984; Schon, 1987; Jackling et al., 1990; Boud & Feletti, 1991; Sultana, 1991; Hughes, 1992; Feletti, 1993; Yaxley, 1993). In spite of an apparent conviction that modern teacher education should produce this kind of practitioner, there has been only modest experimentation involving curricula which might be effective in achieving the goal. Champion (1984), in a study of teacher education institutions ten years ago, asserted that teacher educators demonstrated little awareness of the need for instilling a reflective approach to teacher training. The repercussions on their respective courses were such that it was seen as the responsibility of the teacher educator to seek out and sift information in order then to instruct, rather than stimulate the student teacher to reflect. According to this study, a startlingly low 53% of teacher educators enforced the most fundamental of research methodologies, that of library research using a range of sources. Much less was there any indication of the much fuller researcher teacher training for which Stenhouse (1975) provided such a convincing conceptual plan, and which more recent works, like that of Tamir (1992), indicates as essential to the development of reflectivity.

In their own study, Wedman, Mahlos and Whitfield (1989) recognised the fact of a lack of precedent of research components in the teacher education program and went on to recommend that change in this regard, including much-needed experimentation, must lie with individual program designers. As fortification of this view, Green and Kvidahl (1989), while suggesting an overall lack of research orientation in their own sample of teachers, nevertheless noted that, where it was present, it seemed the impetus had come from a specifically targeted research component in the teacher education program. Tamir (1992) agrees with the assertion that research skills development is a rare feature in preservice teacher education, but goes on to illustrate the benefits of such a program in his own study. What then should be the precise goals of such a program?

Defining Research Goals for Teacher Education

Rudduck (1985) argued that the primary aim of promoting research in teaching was to sharpen the professional curiosity and insight of teachers. Through the reflectivity which was attached to research competence, student teachers would go on to become skilful in ongoing evaluation of their work, and so would gain the benefits of analysing situations otherwise forgotten. In promoting research components in teacher education courses, Brent and Hodges (1988) advocated the adoption of the scientist-practitioner model used in the training of clinical psychologists. This model aimed at the development of research skills, with the eventual application of these skills to practice. Brent and Hodges proposed that the scientist-practitioner model built a strong knowledge base upon which teachers could draw, and, as a consequence of understanding research interpretations, they could more readily incorporate research findings in their classes.

Tom (1985) saw the processes of generating models of inquiry in the student teacher as ranging from low guidance, common sense approaches, to high guidance, discipline based models of research. Most common among the former was the "action research" model, where each teacher is viewed as needing to study his or her own situation in order to understand better the teaching process. A study by Wedman, Mahlos and Whitfield (1989), involving 375 students in their final year at university, incorporated hands on research in an action research framework, and provided an example of Tom's low guidance approach. Other studies which offer instances of more high guidance approaches include those of Blackbourn and Baum (1986), Thomson and Handley (1988), and Peseau (1988). A study which bridges the two approaches is seen in the work of Tamir (1992) who recommends introducing student teachers to research through 'minisearch' projects but with the ultimate goal of producing reputable research papers for publication with collaboration between student teachers and their educators.

Integrating Research in the Teacher Education Program

It would appear that, although research is largely recognised as a necessary educational component, there remain problems in implementation. For Desforges and McNamara (1977), the skills of library research alone are inadequate in the quest to establish reflective thinking skills. For them, research methodology must be integrated into student programs in such a way that the 'student-as-researcher' paradigm becomes a reality. Only in this way is the 'teacher-as-researcher' paradigm likely to ensue. Fortifying the notion of an integrated component, a study cited by O'Hanlon (1988) indicated that discrete curricula employed to teach research skills to students proved to be dry and boring, leading to low and unenthusiastic student participation. A possible counter-measure to this may be to incorporate research components within coursework, thereby creating an environment wherein research skills are needed for task completion. It is this kind of thinking which has acted as inspiration to the authors of the 'integrated research component' described in this paper.

The long-term goal of the foundations strand of the teacher education program in question involves each prospective teacher in an Independent Study during the final year of the program. The parameters of the Independent Study assume that a range of skills related to research are in place by fourth year. In order that this be successfully tackled and accomplished, it is necessary that the work of developing the requisite research skills begins early. The first, second and third years of the program centre, therefore, around the logical and sequential integration of a range of research skills, beginning with basic skills related to literature searches and reviews (see Table 1) and culminating in more sophisticated skills, including situational analyses, case studies, interviews and the writing of research reports (see Table 2). This is done through an 'integrated research component', consisting of small and large research tasks related to the students' coursework.

During the introductory phases of the first year program, the students are given an orientation tour of the Library and instructed in the use of the computerised filing system and the various indexes to literature within the Library. It is believed that this is a vital first step in the process of producing the competent researcher. Many of the research tasks which are given to the students relate directly to locating specific information and presenting it in the forms of annotations, precises, summaries and reviews.

In the first year of the program, much of the literary focus concerns developmental psychology. Research is presented as that set of instruments which allows the developmental psychologist to test and extend theories relevant to her/ his field of inquiry. Beyond this, the students are challenged to uncover their own tacit assumptions about the nature of human development and processes of learning. Forms of empirical research are then presented as ways in which they, themselves, are able to test, in order to verify or disverify, their own assumptions, as well as the theories of the macro-researchers. By this, the students are at least taking the first tentative steps towards developing a comprehensive set of skills related to research.

In terms of the verification or disverification of the theories of the macro-researchers, numbers of research tasks are available. For instance, Piaget's theory of cognitive development (Piaget, 1958) can be explored, stages specified, and a series of tasks set which challenge the students to confirm or disconfirm, from their own experiences, the veracity of the macro-theory. Such tasks could include the students asking children at different ages about situations involving the conservation of number, length and volume. Other tasks might involve the confirmation or disconfirmation of other macro-theories which challenge the Piagetian macro-theory (Borke, 1983; Hughes & Donaldson, 1983). Similar empirical investigations can be arranged which focus on other macro-theorists which the students will confront in their developmental psychology strand.

By the end of the first year of the program, the intention is that the students have laid essential foundations for their careers as researcher teachers. Hopefully, they have developed skills especially related to the technical side of research. For instance, they are able to locate and summarize vital information from books, journal articles and audio- visual sources, and provide accurate bibliographical details. As well, they are able to manage the technical aspects of research strategies, such as questionnaires, participant observation and interviews. Much of this, at this stage, will be conducted on a group basis, and move towards individual action only when greater confidence and competence in research is in place. Similarly, much of the movement into the more interpretive aspects of research is done on a group basis, at this point. Precisely, the movement into interpretive research takes the forms of presenting data in tabular and graphic forms, interpreting the data, interpreting statistical information, disseminating information and compiling a research report.

The second and third years of the program see an extension of the research skills, both in type and in autonomy of each individual as researcher. The focus of content in the second year program concerns patterns of learning and, in particular, difficulties related to learning. This provides a fertile field for the movement into a greater use of interpretive research skills, as students are challenged to identify problems in learners and to organize curriculum opportunities which can overcome these problems. In order to accomplish these successfully, their powers of observation, empathic listening and interviewing have to be maximized. While they are still encouraged to employ the support of their own peer groups, they are challenged, in some tasks, to engage in independent research as well.

The third year of the program focusses on sociological issues and curriculum theory. The students are introduced to the critical theories of such social philosophers as Habermas (1972, 1974), Apple (1974, 1979), and Giroux (1981, 1989), and to the curricular application of such theories in strategies like `action research' (Kemmis & McTaggart, 1988). No longer is the small, regular and shared task considered to be adequate on its own. The emphasis, now, is on complementing these with a larger, more integrated, and decidedly more independent research project. Use is also made of the fact that, by the completion of the third year of the program, each student has engaged in at least three extended practice teaching sessions and many smaller explorations into the classrooms. Students are challenged to make use of these ses-

sions, especially their third year one, in order to engage in a measure of action research.

Typically, third year will begin with the student being directed to an area of interest to sociology or curriculum theory. An extended literature review will preface the practice teaching session, and insights and assumptions drawn from this review will then be complemented and tested by an instrument or strategy, probably a species of action research, when the student moves into the school. In the period after the practice teaching session, findings will be disseminated and presented in report form. In some instances, the third year research project will form the basis of the much larger and more ambitious fourth year Independent Study. Even if this is not the case, the third year project has normally established the kinds of methodological processes which are necessary for the Independent Study.

Researching the Research Component

In the interests of verifying or disverifying their own assumptions, the authors of this paper engaged in a longitudinal study, the subjects of which were a cohort of students moving through the first three years of the teacher education program, including the 'integrated research component'. Baseline measures were taken on 227 students during the first semester of First Year. Subsequent testing was conducted at the end of First Year, Second Year and Third Year. One hundred and fifty-one (66.5%) of these students completed the last testing (loss of the sample was caused by a combination of withdrawals throughout the three years and absenteeism on the day of final testing). The cohort was constituted of student teachers in Early Childhood (N=16), Primary (N=45) and Secondary (N=90). Of this sample, 106 (70%) were female and 123 (81%) were under 21 years of age.

The perceived competence of research skills was measured by a five-point Likert-type scale (1=not at all well, 2=not very well, 3=moderately well, 4=very well, 5=extremely well). The instrument assumes some belief in the validity, if not the formative power, of self-checking and self-evaluation. According to Table 1 and Table 2, students reported low levels of competence in all research skills, but reported significantly higher competence after three years of following the program of the integrated research component.

CONCLUSION

The results highlight a number of important points concerned, first, with the perception of these students towards their own research capacity, and, second, with the effectiveness of the 'integrated research component'. In summary, it would seem that these students have entered teacher education lacking basic skills deemed necessary for eventual research competence. This was predictable. More significantly, at least according to student self- perception, these skills have been developed to a reasonable extent by the time they are required to engage in their Independent Study. While it was not possible to test by means of a control group, anecdotal comparison with earlier cohorts of students would seem to indicate that the 'integrated research component' has had some impact in assisting with the development of these basic skills. Further evaluative work is in progress.

TABLE 1: Differences in student perceptions of competence in literature skills			
	PRE mean (sd)	POST mean (sd)	t
Locate literature through CIJE	1.77 (1.05)	4.26 (.69)	-23.71*
Locate literature through library computer facilities	1.67 (.89)	3.45 (.89)	-17.61*
Locate information to support argument	2.71 (.97)	3.37 (.65)	-7.28*
Precis journal articles and book chapters	1.97 (1.03)	3.33 (.77)	-12.85*
Annotate journal articles and book chapters	1.81 (.99)	3.44 (.82)	-15.67*
Draw up a reference list using an approved system	1.36 (.84)	3.57 (.97)	-20.35*

* p<.001

TABLE 2: Differences in student perceptions of competence in research methods, data collection and research reporting

	PRE mean (sd)	POST mean (sd)	t
Construct survey instruments	1.74 (.87)	2.64 (.69)	-9.97*
Develop a questionnaire	2.60 (.80)	3.00 (.74)	-4.65*
Conduct an interview	2.75 (.75)	3.15 (.77)	-5.25*
Interpret graphic data	2.24 (.81)	2.78 (.94)	-5.71*
Present information in tabular form	2.68 (.99)	3.34 (.87)	-7.11*
Compile a document using word processing	2.26 (1.01)	3.34 (.99)	-11.09*
Disseminate research results	1.81 (1.25)	3.11 (1.23)	-12.08*
Compile a research report	1.90 (.85)	3.00 (.70)	-12.13*

* $p < .001$

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