

The Role of Research and Inquiry in Undergraduate Teacher Education

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The Problem

For some time, the University of Wollongong's Faculty of Education has offered compulsory subjects in research and inquiry during the fourth year of the undergraduate Bachelor of Education program. Student evaluations in 1993, however, indicated that many students felt ill-prepared to undertake their Honours thesis or school-based inquiry studies because of their late exposure to formal studies in research and inquiry. Subsequently, a working party was established to examine the logistics of the teaching of research methods earlier in the undergraduate program. The questions that faced us were whether research methods should be taught as a separate subject or whether they should be integrated through all subject offerings throughout the four-year program, and if a separate subject were to be offered, in which year would the subject best be located.

In order to address these questions, an extensive survey of student and staff perceptions was initiated by the working party along with a thorough examination of the research literature. In this paper, we present our findings from the survey and the research literature in order to argue that the teaching of a compulsory subject in research and inquiry is a crucial part of any undergraduate teacher education program. It is particularly critical in the current educational climate when there are increasing calls for the professionalisation of teachers and for greater accountability in schooling generally.

Literature Review

There is a paucity of literature that specifically addresses the issue of the teaching of research methods in undergraduate teacher education programs. Over the last decade, however, a number of governmental reports have indicated the importance of teachers' skills in research methods as an agent of change. For example, The Joint Review of Teacher Education (Commonwealth Schools Commission, 1986) recommended that the core of teacher education courses include studies in "methods of inquiry and research". A more recent report noted the need for novice teachers to reflect critically on their practice, to have knowledge of current educational issues, to regularly update

their knowledge of research, and to initiate, contribute to and facilitate research (NSW Ministerial Advisory Council, 1994). Other reports provide similar suggestions (The Holmes Group, 1986; Vonk & Van Helden, 1992). In general these reports argue for the need to change the teacher from being merely a delivery agent to one who is an active participant in stretching the boundaries and enhancing the profession (Schools and Curriculum Policy Branch, 1991, p. 9)

Such reports are supported by the growing body of literature in school restructuring and professional development. The recurring themes in this literature are the professionalisation and

empowerment of teachers. Inherent in the rhetoric of empowerment and professionalisation is the role of reflection on and inquiry into the teacher's own practice. A partial solution to the problem of teacher professionalisation, therefore, lies in making teachers researchers of their own practice. Lieberman and Miller (1990), while noting that the notion of teacher as researcher is not new, argue for the importance of teachers developing the skills and confidence to carry out their own systematic investigations, so they are able to understand and improve their classroom practices. Similarly, Elliott (1983) argues that an action research model is the way to create a "reconstructed interpretative paradigm" (p. 12) for the study of educational issues. There is widespread support for the use of action research in restructuring of schools (Holly & Southworth, 1990; Jacullo-Noto, 1992; Lieberman, 1988; Oja & Smulyan, 1989; Sagor, 1992). Additionally, action research has been advocated as a model to support the professional development of teachers.

The picture that emerges from the literature, then, is that school improvement at the macro level will be largely accomplished by the development of professional, empowered teachers. It is our contention that the latter may best be accomplished through the development of reflective teaching, critical inquiry, self-evaluation, and professional dialogue with the teacher acting as both consumer and producer of research (Neubert & Binko, 1986).

It has been widely reported that teachers are wary of research, questioning its relevance and its contradictory findings among other perceived shortcomings (see Green & Kvidahl, 1989, 1990; Elliott, 1983; Cochran-Smith & Lytle, 1990). But teachers who have had some training in research methods, either at an undergraduate or graduate level are far more likely to use research in their classrooms. Green and Kvidahl's (1989) research with 441 teachers in the USA, for example, demonstrated that

teachers were more likely to read, use, conduct, and present research findings if they had experienced some training in research methods. In fact, 77% of the teachers in their survey believed that training in the reading of research should be included at the undergraduate level, while 66% thought training in conducting research should be included in all initial teacher-education courses.

The exposure of student teachers to research methods is endorsed by Smagorinsky and Jordahl (1991) who, based on their findings from a collaborative research study between themselves as student teacher and co-operating teacher, posit that such exposure could serve to inculcate habits and attitudes that will enable the aspiring teachers to continue to grow in their professional lives. Kleinfeld's (1991) study of her university students, demonstrated that students taught by the case method, as opposed to traditional lecture/tutorial presentation, developed superior abilities to identify a range of issues in educational problems, to analyse these issues in a more sophisticated manner, and to identify many more potential solutions to educational problems. The students taught in this way also regarded the teacher as an autonomous professional rather than a practitioner.

Regardless of the logistics of the design and delivery of research methods courses, there is clearly a strong case in the literature to support the existence of explicit education in research methods at the undergraduate level. The studies cited

above demonstrate a strong link between the student teacher's exposure to principles of research and their later professional orientation toward reading and applying research, and to conducting reflective inquiry on their own teaching practice and broader educational issues.

The Wollongong Context

In order to determine the need for, location and nature of a subject in research and inquiry at the undergraduate level, a working party was established. The subsequent investigation entailed the audit and assessment of the current teaching of research methods in the Faculty of Education's undergraduate programs. This was undertaken by: (1) a review of the subject outlines of all research subjects taught in 1993; (2) the development of an Inquiry/Research Skills Inventory [Appendix A]; and, (3) an evaluation of student and staff perception of the coverage of the inquiry skills and research knowledge that had been developed in their respective research subject(s).

The Inquiry/Research Skills Inventory was developed initially

from an analysis of the 1993 research subjects' outlines and subsequently validated by "expert" input from the research subject coordinators and the working party personnel. The final Inventory included 54 individual skill or knowledge components [eg referencing via the electronic indexes and CD Roms: ERIC or ethics in inquiry] which were grouped under the following eight subsections:

- defining the problem;
- information location and library skills;
- knowledge about aspects of research;
- data gathering skills;
- data organisation and analysis;
- writing process;
- presentation and communication of findings; and,
- group work skills in joint inquiry.

The Inquiry/Research Skills Inventory was then used to review the subject outlines of the five research and project/thesis subjects available in 1993 by the respective subject coordinators. It was also used as the basis of a student evaluation instrument of third year PE/Health and final year BEd primary students in late November, 1993. Response rates from the mail-out survey were: PE/Health 8/16 - 50%, Research and Inquiry Methods for B.Ed. Pr 21/60 - 35%, Inschool 7/18 - 39%, Honours group 8/17 - 47%.

Additionally, all new 1994 fourth year primary students' perceptions of the coverage of research and inquiry skills in their first three years were surveyed using the Inquiry/Research Skills Inventory. They were asked how adequate do you feel the subjects were in your first three years in developing your research methodology skills ? The survey was undertaken in their first class in 1994 and attained a response rate of 81%. In November, 1994, a follow-up survey was undertaken with these students and 62% responded. The students were asked to assess their confidence in their research skills and knowledge [using the Inventory] and to estimate on a four point scale the "... extent you have used the knowledge and skills covered in research methods and other areas of your work at university this year." In addition, the students were asked to indicate the value and timing of the research and inquiry methods subject in the four-

year program.

Finally, all subject coordinators of the core subjects in the first three years of the Primary and Health/Physical Education programs were requested to complete the Inquiry/Research Skills Inventory and indicate: (1) the extent that the skills are currently covered in their subjects; and, (2) the extent to which

they could be covered if an across-the-curriculum approach to research methods were taken. Despite follow-up reminders, the response rate was low with only nine staff responding with data from 15 of approximately 90 subjects available in the program.

Interpretation of Survey Data

The majority of third year PE/Health and final year BEd primary students, commenting on their experiences of research methods, indicated that they had only experienced an introductory level of knowledge on the 54 items on the Inventory. The student perception was generally matched by the perceptions of the coordinators of the research subjects, with only eight of the 54 items being rated slightly higher by the staff. The items rated higher by the staff than students included: Problem Definition; Range of Inquiry Paradigms; Qualitative Research; Action Research; Ethics in Inquiry; Overview of Instruments and Instrumentation; Ethnographic and Participant Observation; and, Classroom Teacher as Participant Observer. Each of these items is drawn from the first three components of the Inventory. Total accord was attained on the other five components of the Inventory. Thus, staff and students were generally in accord regarding the level of coverage of the various components of the research methods subjects. Two other results from the data are of interest. Third-year PE/Health students generally rated their level of coverage more highly than the fourth-year Primary students. It must be noted, however, that the PE/Health students undertake the subject as an elective and have high levels of motivation in gaining understanding from the subject for their thesis projects in the following year. Nevertheless, the PE/Health sequence was used by the Working Party as an alternative model of delivery. Primary students rated the level of coverage in their practical experiences (either in the In-school Project or the Honours Thesis) more highly than the subject ratings.

Analysis of the 1994 cohort's perceptions of the coverage of research methods in the subjects from their first three years indicates a similar pattern of response with the majority of items receiving the rating of introductory coverage only. Again, the responses of the staff endorse the student perceptions with the majority of staff rating the 54 items in their core subjects as introductory level only. More importantly, though, these staff members strongly indicated a lack of willingness to change the emphasis in their subjects in future years.

The follow-up survey conducted with the 1994 cohort asked them to indicate whether or not the subject in Research and Inquiry should be compulsory and if so, in which year of their program it should be located. They were also asked to comment on how useful they thought the subject would be in their future teaching

careers. Sixty students responded to the survey. With regard to the issue of compulsion, 87% of the students indicated that they felt the subject should be compulsory while only 3% indicated that it should not be compulsory. Although the majority of students (87%) selected the third year of the program as the

preferred location for the subject, there was some support for even earlier location-viz 63% in favour of and 13% against second year location; and, 42% in favour of and 32% against the subject being conducted in the first year. It is clear that while there is strong support for earlier study of research methods, a sizeable group believes that the first year is too early.

Finally, the follow-up data from the 1994 cohort demonstrated a high level of perceived usefulness of the research and inquiry subject. Seventy-eight percent of the students indicated that they thought the subject would enable them to be more reflective practitioners as well as more informed consumers of research. Additionally, 65% indicated that the subject would enable them to experiment more in their own teaching approaches. These data support the close relationship between the study of research methods and reflective teaching practice that we have derived from the research literature.

Recommendations

Analysis of these survey data support the literature in making a strong case for the teaching of a compulsory subject in research and inquiry in the early stages of teacher training. There is a strong case for the inclusion of research methods at an earlier stage in undergraduate teacher education and it is clear from the survey that an across-the-curriculum approach is unlikely to attain the desired outcome. The current offering of a subject in fourth year, similarly, is not meeting the needs of the students, coming at a time when many are trying to conduct research studies. Thus, we have argued that a subject earlier in the training sequence allows the introduction of the range of issues and skills in research and inquiry that may be consolidated through subsequent practical research activities and other subject offerings. To this end, the following recommendations were made by the Wollongong working party.

Approaches to Teaching and Learning about Inquiry.

At the Faculty level, the Working Party recommends that staff:

1. Identify a variety of research subskills and knowledge for systematic integration/infusion across the curriculum and throughout the subjects in the pre-service teacher education courses.

2. Initiate Faculty discussion of the most appropriate teaching/learning processes to foster the development of an inquiry oriented, reflective teacher and to enhance a culture of critical inquiry within the Faculty.
3. Devise presentation and assessment strategies to ensure the implementation of inquiry oriented teaching/learning approaches within the curriculum.
4. Establish evaluation criteria and develop processes to assess the outcomes (knowledge, skills and attitudes) of the implementation of inquiry oriented teaching/learning approaches.

Course Structure

5. That inquiry approaches be covered as a sequence of two subjects for Primary students, the first to be taught in the Autumn session of the student's third year, and the second for

Honours students to be taught in Autumn Session of the fourth year.

6. Discussions be undertaken with subject coordinators to integrate the teaching of introductory research methods across the Primary and PE/Health programs with a specialist lobe based subject. The curriculum of the subject to take account of specialist inquiry needs of the different program groups within the program.
7. Identify potential Honours students by both self identification and Faculty invitation by the beginning of Autumn Session in third year.
8. Involve potential Honours students in a number of research oriented seminars during Spring Session of their third year.
9. Honours supervisors be given the opportunity to teach in the advanced research methods subject.

Future Developments

Although the investigation described above was occasioned by student perceptions of their readiness to undertake research-based thesis studies, it has highlighted a critical issue in the preparation of teachers generally. Our investigations have underscored the need for practising teachers to be reflective practitioners who are not only cognisant of current research but also able to undertake research in their own classrooms. It

becomes essential, then, for teacher education institutions to respond by equipping all graduates with the skills of critical inquiry. The decision to offer a compulsory subject in research and inquiry in the third year of the undergraduate program is seen as an initial step toward such an outcome. As we monitor the developments in our programs in the future, we anticipate that the compulsory subject may be offered in either the first or second year and that it would be more systematically consolidated through research-based components in other subjects in the program.

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Appendix A: Inquiry/Research Inventory

INQUIRY / RESEARCH SKILL

1. DEFINING THE PROBLEMa. Problem Definitionb. Negotiation of the research question(s)c. Inquiry into the nature of the major varieties of research and then application

2. INFORMATION LOCATION

& LIBRARY SKILLSa. Developing library research skillsb. Understanding & accessing research literaturec. Referencing via the electronic indexes/CD Roms:
ERIC, AEI & CARL (UNCOVER)

3. KNOWLEDGE ABOUT:a. Range of inquiry paradigmsb. Designing Researchc. Ideology & Types of Researchd. Qualitative Researche. Quantitative Researchf. Action Researchg. Designing & Planning a Project h. Planning a Research Timelinei. Ethics in inquiryj. Validity and Reliabilityk. Ethics Committee expectations

4. DATA GATHERING SKILLSa. Overview of Instruments and Instrumentationb. Developing research Questionsc. Hypothesis Testingc. Identifying & Labelling Variablesd. Sampling and Samplese. Defining, manipulating & controlling variablesf. Ethnographic & Participant Observationg. Interviewingh. Survey/questionnaire designi. Data gathering with Video & Audioj. Structured Observationk. Archives & Work Samplesl. Classroom Teacher as Participant Observerm. Journal & Diary Writing

5. DATA ORGANISATION & ANALYSISa. Data organisationb. Data classificationc. Categorisationd. Choosing applicable statistical analysis to determine statistical validitye. Correctional design & analysisf. Statsview & Spread Sheetg. Interpreting Statistics h. Graph Makingi. Analysing Interview & Survey Dataj. Evaluating The Analysis

6. THE WRITING PROCESSa. Writing Stylesb. Drafting and editing - bibliographic skillsc. Word-processing and editingd. Integrating data into written reportse. Report Writingf. Writing Research Proposals

7. PRESENTATION & COMMUNICATION OF RESEARCH FINDINGSa. Negotiation Skillsb. Speaking & listeningc. Seminar Presentationsd. Critical Analysis & reflection - research seminar

8. GROUP WORK SKILLS IN JOINT INQUIRYa. Articulating personal position (value of inquiry)b. Collaborating in inquiry activitiesc. Developing a commitment to Inquiry for teachers