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ABSTRACT

This study assessed the contribution of training in research methods and post-bachelor's education to explaining teachers' self-reported use of research in their classrooms and their opinions about research. Subjects were 441 teachers from 2 Midwestern states. Significant differences in use of research were found for degree held (bachelor's, advanced degree) and for whether coursework in research methods had been taken. Those with advanced degrees and research methods coursework reported a greater use of research. Significant effects were also found for attitude toward the quality and usefulness of the research methods coursework. No significant interactions were found among independent variables. Results support the provision of research methods courses in either undergraduate or graduate programs if one's purpose is to increase teachers' use of research. (Author)

RESEARCH METHODS COURSES AND POST-BACHELOR'S EDUCATION: EFFECTS ON TEACHERS' RESEARCH USE AND OPINIONS

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ABSTRACT

This study assessed the contribution of training in research methods and post-bachelor's education to explaining teachers' self-reported use of research in their classrooms and opinions about research. Subjects were 441 teachers from two midwestern states. Significant differences in use of research were found for degree held (bachelor's, advanced degree) and for whether coursework in research methods had been taken. Those with advanced degrees and research methods coursework reported a greater use of research. Significant effects were also found for attitude toward the quality and usefulness of the research methods coursework. No significant interactions were found among independent variables. Results support the provision of research methods courses in either undergraduate or graduate programs if one's purpose is to increase teachers' use of research.

In recent years the reform of teacher education has been given much attention as has the reform of the public school system. One suggested reform is to increase the research base of teacher education to promote the application of research findings in classrooms. There seems to be some agreement that a knowledge base that is more reliable, valid, and extensive than ever before is now accessible to teachers (Reynolds, 1989). Robinson (1988) states that "If ever the climate existed for researchers and practitioners to apply measurement, evaluation, and research to the improvement of educational practice, it is now" (p.64). Gage and Berliner (1989) recommend that we teach beginning teachers to be intelligent users of educational research. This means increasing the technical knowledge base that teachers have in basic research competencies.

Scholarship is held to be an essential element of good teaching; teacher educators without a commitment to scholarship "contribute to education's second class status" (Wisniewski, 1986). Just as scholarly activity is held to be essential at the university level, it is also argued that the practice of engaging in research and critical inquiry is essential to the classroom teacher's performance and sense of professionalism as well as to the revitalization of public education (e.g., see Fleming, 1988; Griffin, 1984; Rackliffe, 1988). Those arguing for an increased knowledge and use of research by teachers state that teachers with an understanding of research can evaluate the products of research and identify their applications and limitations--"consumer protection" (Lanier & Glassberg, 1981). Conduct and knowledge of research allows for greater understanding of the school as a workplace, informs development of a technical core of teaching, promotes questioning and reflection, and helps articulate one's views of teaching by provision of counterpoint (Griffin, 1984). Teachers can compare their own understanding and experiences with the "truth" of research. With attention to critical thinking and research, the teacher ideally is scholar as well as clinician. Also, public accountability demands increase the need for research-based teaching and learning strategies (Robinson, 1988).

Programs that have been developed to link researchers and practitioners are in part a response to the perception that classroom teachers are untrained in research methods, have negative attitudes toward research in general, and underutilize research (Adams, 1976; Brown, 1976; Green & Kvidahl, 1989; Kaplan, 1976; Rudduck, 1985; Rumstein, 1972; Zahorik, 1984). Clemson et al. (1989) found students entering a research-oriented program to have more positive attitudes toward research than students entering field-based program. This suggests the presence of a self-selection bias in applicants to teacher education programs.

One reason offered for the perceived failure of teachers to use educational research is that research is not usually part of undergraduate training and teacher education is predominantly an undergraduate program. Many teachers lack basic skills in understanding and interpreting research, much less skills to conduct research (Fleming, 1988; Rackliffe, 1988). Research skills are not generally considered to be among the survival techniques preservice teachers need to learn (Kaplan, 1976). Research methods courses <u>are</u> required by graduate programs, however (Doak, 1982) and so involvement in research by teachers with advanced degrees should be greater. The National Council for the Accreditation of Teacher Education (NCATE) has a standard requiring the study of research methods and findings in advanced programs. A 1965 survey of 76 institutions awarding the doctorate showed that a research methods course was required

in all but 11 (Kratwohl, 1965). A more recent survey found an introductory course in research required by master's programs in 21 of 31 universities in a 13-state region (Doak, 1982). Eaker and Huffman (1981) reported that 75% of the teachers they sampled agreed that research findings, if not methods, should receive greater emphasis at the undergraduate level; 64% believed graduate programs in education are the most appropriate place to learn about research methods.

The effectiveness of introductory research methods taught at any level has rarely been empirically assessed. Todd and Reece (1987) surveyed teachers, administrators, and other professionals who had taken an introductory research methods course at master's level between 1980 and 1985. The course was perceived as most helpful in providing familiarity with research terminology and developing the background needed to critically evaluate research reports. Just over half of the sample perceived the course as useful in their jobs.

The major purpose of this ex post facto study was to assess the main and interactive contribution of coursework in research methods, education beyond the bachelor's degree, and gender to an explanation of teachers' reported use of research. In this process, opinions regarding the place of research coursework in the curriculum were solicited as were opinions regarding the quality and usefulness of research methods courses and behaviors such as conference attendance, journal subscription, and membership in professional organizations.

METHOD

Subjects were inservice teachers from two midwestern states. Six hundred names were randomly selected from the State Department of Education lists of inservice teachers in the fall of 1987, 300 from each state. Response rate to the survey was 73.5% after two follow-ups with a total of 441 usable responses. Table 1 provides a description of the sample.

The authors constructed a 54-item questionnaire (two pages double-sided) eliciting demographic information, information oncoursework in research methods and perceptions of training (5 items), conduct of research activities (12 items), and opinions about research (23 items). A six-point Likert scale was used for opinion and use of research items with higher values indicating more positive opinions/greater use of research. Also included were open-ended questions asking about membership in professional organizations, journal subscriptions, and research projects conducted by the respondent. Of these items, 46 were fixed response items and 5 were open-ended. Length of time for survey completion was estimated at approximately 10-15 minutes.

Internal consistency reliability estimates were calculated for the four opinion and conduct of research measures which were multi-item indices. These estimates were .81 (research literature review, 5 items), .65 (research observation/data collection, 3 items), .76 (research presentation, 3 items), and .76 (attitude toward research, 23 items). Examples of items included in the first three measures are, respectively: (To what extent you have in your teaching career) reviewed the research literature on a topic, worked with other teachers on a local/district research project, written a research report. Three examples of opinion items are: Research results suffer from a lack of specificity. Research done by teachers would be taken seriously. Research reports are hard to understand.

These four multi-item measures were used as dependent variables in this study. Other variables treated as dependent were conference attendance, number of journal subscriptions, and number of professional organization memberships.

RESULTS

College coursework in research methods was reported by 40% of the sample (n=174). Of these, 69 (15.6%) had a research course in their undergraduate program, 149 (33.8%) had a course in graduate school, and 14 (3.0%) had inservice training in research methods. Teachers with no coursework in research methods viewed their training in research as inadequate (80%) somewhat more than teachers with coursework in research methods (69%: $\chi^2 = 22.15$, $p<.01$). Most teachers agreed that undergraduate programs should provide training in reading research (77%) and in doing research (66%).

Research use by teachers was low on average. Teachers reviewed the research literature on average at least once a year but very rarely conducted or presented research findings. Opinions about the usefulness and desirability of research were, however, generally positive.

Nearly all (81.6%) of the respondents reported at least one membership in a professional organization, with a mean number of memberships of 2.5; 61.5% of the sample subscribed to at least one professional journal (mean number of subscriptions = 1.4); and 65% have attended an educational convention or national/regional meeting in the past two years.

The following relationships were found among the independent variables used in this study. The relationship between education and coursework in research methods was significant ($\chi^2 = 81.44$, $p<.001$) with greater numbers of teachers with advanced degrees reporting coursework in research methods. The relationship between research coursework and gender was significant ($\chi^2 = 16.64$, $p<.001$), with a greater proportion of males having taken a research course. The relationship between education and gender was also significant ($\chi^2 = 0.67$, $p<.001$), with more males than females holding advanced degrees.

Four separate multivariate analyses of variance were conducted. The first used graduate education (bachelor's versus advanced degree), coursework in research methods (coursework versus no coursework), and gender as the independent variables. Dependent variables were the four multi-item summary measures described in the method section. Significant main effects were found for education and coursework with no significant main effect for sex. No significant interactions were found. Table 2 presents the results of the multivariate and univariate tests with means for each group. Teachers with advanced degrees reported a greater use of research and more positive opinions about research. Teachers with coursework in research methods reported a greater use of research and more positive opinions about research.

Table 3 presents the results of a similar MANOVA using individual items rather than aggregate measures as the dependent variables. This MANOVA overlaps the first MANOVA conducted and described in the preceding paragraph. It was performed to identify more specifically for which items effects would be found.

For the last two MANOVAs, only subjects reporting research methods coursework were included in the analysis. The next MANOVA used the four aggregate measure dependent variables with perceived quality of research methods coursework as the independent variable. A significant overall

main effect was found, with higher perceived quality associated with greater presentation of research and more positive attitudes toward research. The last MANOVA used perceived usefulness of research methods coursework as the independent variable. Again, a significant overall main effect was found, with greater perceived usefulness associated with greater use of literature review, presentation of results, and attitudes toward research. These results are presented in Table 4.

Effects of education, coursework, and gender on conference attendance were assessed. More women than men reported conference attendance (^{2} = 6.51, $p<.02$). Holding an advanced degree had no relationship to conference attendance nor did coursework in research methods. Effects of the three independent variables on number of organizational memberships were not significant. There were also no main effects of gender, coursework, or educational level on number of journals subscribed to, but there was a significant ($p<.05$) gender x education interaction. This interaction is graphed in Figure 1.

DISCUSSION

Consistent with Fleming (1988) and Rackliffe (1988), teachers reported feeling inadequately prepared to understand and conduct research, including those with some research methods courework. Less than half of the teachers reported any training in research methods. Consistent with previous studies, teachers were found to report little conduct and presentation of research, though opinions toward research were generally positive. This low reported use of research is not surprising. Teachers do not receive the rewards for doing research that university faculty receive nor do they have the same resources or time allocation to research.

Teachers with advanced degrees reported a greater use of research. This is, again, not surprising. Since a research project is generally a required part of an advanced degree program, teachers must have completed at least one research project. The mean scores for research presentation suggest that on average teachers have not gone beyond that.

The finding of significant differences between those with and without a research methods course is encouraging (and hopefully represents more than a reporting or self-selection bias). The difference could have been an artifact of required course research. But, differences were found aside from university class presentation (see Table 3). This result suggests that a research methods course may potentially contribute to greater use of research by teachers. Consideration should be given to the place of explicit education in research methods in the teacher education curriculum.

Of those who had a research methods course, 60% reported the usefulness of the course as good or excellent, and those rating the usefulness of the course higher were more likely to engage in research review and presentation. Again, this result could be due to a true effect or to self-selection or reporting bias. It is possible that a clear demonstration of the utility of research by instructors may encourage greater use of research by teachers. That is, the link to everyday classroom life may need to be explicitly drawn. Similar conclusions can be drawn regarding perceptions of the quality of the course.

If a research methods course were to be offered in preservice teacher education programs generally, it would require a somewhat different focus and design from that offered in master's and doctoral programs. Gable and

Rogers (1987) present examples of how they demystify research in their classes and make the course meaningful to teachers' classroom lives. This includes greater discussion of observational and qualitative methods than might be the case in many research courses, application in class projects of dta gathering and sorting, use of statistics packages on microcomputers, and a general rephrasing of research methods in applied terms. The instructor for such a course may wish to reinforce concepts with a greater use of examples from school classrooms and also make greater use of "case studies" of research actually conducted by inservice teachers.

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Table 4

MANOVA of Use of Research and Opinions About Research by Quality and Usefulness of Coursework (n=158)

Quality of Coursework: Wilk's Lambda = .85, p<.002					
Variable	Excellent	Good	Fair/Poor	F	p
Review of literature[a]	4.16	3.60	3.74	2.02	.14
Conduct of research[a]	2.33	2.04	2.08	.81	.45
Presentation of research[a]	2.41	1.81	1.97	4.45	.02
Opinion about research[b]	4.24	3.92	3.71	9.12	.001
n	25	89	44		

Usefulness of Coursework: Wilk's Lambda = .85, p<.004					
Variable	Excellent	Good	Fair/Poor	F	p
Review of literature[a]	4.61	3.76	3.56	5.05	.009
Conduct of research[a]	2.49	2.17	1.92	2.40	.10
Presentation of research[a]	2.49	1.88	1.87	3.39	.04
Opinion about research[b]	4.26	3.95	3.74	7.90	.002
n	17	74	59		

[a]Rated on 1-6 scale with 1=never, 2=once, 3=about once a year, 4=more than once a year, 5=1-2 times per year, 6=3+ times per year. [b]Rated on 1-6 scale with 1=strongly disagree and 6=strongly agree.

Figure 1.

Interactive Effects of Education and Gender on Journal Subscriptions

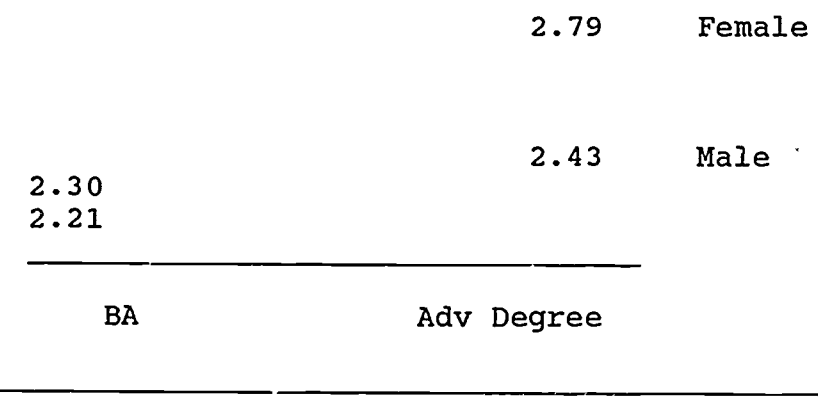

Table 1

Description of the Sample (n=441)

Variable	%	Variable	%	Variable	%
Age: 20-29	8%	Sex: Male	45%	Level Taught:	
30-39	41%	Female	55%	Elementary	35%
40-49	35%			Jr H/M S	22%
50-59	12%			High S	28%
60+	5%			K-12	15%

Usefulness of Research Course:		Quality of Research Course:	
Excellent	11%	Excellent	16%
Good	49%	Good	57%
Fair-Poor	40%	Fair-Poor	27%

Table 2

MANOVA of Use of Research and Opinion About Research by Education, Coursework, and Gender (n=374)

Education, Coursework, Gender Interaction: Wilk's Lambda = .995, p>.77
Education, Coursework Interaction: Wilk's Lambda = .994, p>.69
Coursework, Gender Interaction: Wilk's Lambda = .984, p>.20
Education, Gender Interaction: Wilk's Lambda = .982, p>.16
Gender Main Effect: Wilk's Lambda = .983, p>.18

Education Main Effect: Wilk's Lambda = .96, p<.008

Variable	Mean Adv Degree	Mean BA	F	p
Review of literature[a]	3.78	3.23	7.27	.008
Conduct of research[a]	2.09	1.66	3.34	.07
Presentation of research[a]	1.91	1.37	11.75	.002
Opinion about research[b]	3.86	3.74	.26	.62
n	140	234		

Coursework Main Effect: Wilk's Lambda = .91, p<.001

Variable	Mean-Course	Mean-No Course	F	p
Review of literature[a]	3.77	3.20	10.93	.002
Conduct of research[a]	2.13	1.59	16.97	.001
Presentation of research[a]	1.93	1.32	31.60	.001
Opinion about research[b]	3.89	3.70	7.63	.007
n	156	218		

[a]Rated on 1-6 scale with 1=never, 2=once, 3=about once a year, 4=more than once a year, 5=1-2 times per year, 6=3+ times per year. [b]Rated on 1-6 scale with 1=strongly disagree and 6=strongly agree.

Table 3

Means, Standard Deviations, and Differences for Education and Coursework by Items Relating to Use of Research (n=371)

Education, Coursework, Gender Interaction:	Wilk's Lambda = .967, p>.45
Education, Coursework Interaction :	Wilk's Lambda = .961, p>.29
Coursework, Gender Interaction:	Wilk's Lambda = .963, p>.34
Education, Gender Interaction:	Wilk's Lambda = .967, p>.45
Gender Effect:	Wilk's Lambda = .962, p>.30

Education Main Effect: Wilk's Lambda = ,94, p<.04

Variable	Mean Adv Degree	Mean BA	F	p
Written a research report.	2.45	1.68	17.85	.01

Coursework Main Effect: Wilk's Lambda = .88, p<.001

Variable	Mean Coursework	Mean None	F	p
Reviewed the research literature on a topic.	4.16	3.56	12.11	.001
Discussed research literature with colleagues.	4.36	3.81	8.39	.005
Gathered data about whether a method, project, etc. worked.	3.10	2.39	9.65	.003
Worked with other teachers on a local/district research project.	2.61	2.03	7.93	.006
Worked with other teachers on a regonal research project.	1.78	1.38	9.19	.004
Worked with college or university colleagues on a research project.	1.96	1.34	24.85	.001
Written a research report.	2.41	1.59	25.84	.001
Presented research findings to a college or university class.	1.89	1.27	20.71	.001
Presented a research paper at a professional meeting.	1.40	1.05	17.85	.001
Published a research paper in a professional journal.	1.18	1.00	11.68	.001

Note. Items were rated on a 1-6 scale with 1=never, 2=once, 3=about once a year, 4=more than once a year, 5=1-2 times per year, 6=3+ times per year. Only items with differences significant at p<.01 are listed.

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