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IDENTIFIERS	George Mason University VA

ABSTRACT

This paper presents a collaborative action research partnership model that involved participation by graduate school of education preservice students, school and university teachers, and administrators. An elementary teacher-research group investigated what would happen when fourth graders worked in teams to research and produce a multimedia presentation. The project examined how students would exhibit team roles (idea person, architect/designer, explorer/tinkerer, builder, information organizer, or lost soul). University students entered the classroom periodically to observe student partner groups completing various project tasks. They acted as observers and evaluators, taking notes on interactions. An attitudes survey examined pupils' attitudes about the project. Most of the fourth graders fell into two or more role categories: builder (80 percent) and information organizer (72 percent). About half exhibited architect/designer roles. When students needed to decide who had control of the computer, they demonstrated one of three turn-taking behaviors. There was no relationship between students' attitudes toward paired work and project achievement. Most students had positive feelings about teamwork. A field experience research model at one graduate school of education formed partnerships between a high school and university to improve teachers' ability to work effectively with language minority students. Graduate preservice teachers worked collaboratively with inservice teachers on projects representing their professional interests, allowing preservice teachers to be active participants in the schools. This paper lists benefits of such partnerships to those involved. (SM)

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Partnering the University Field Experience Research Model with Action Research

Donna Schnorr. Ph.D. and Diane D. Painter. Ph.D.

Abstract

The action research partnership model presented in this paper demonstrates the necessity of viewing scholarship as advanced by the Carnegie Foundation: the four overlapping dimensions of the scholarship of discovery, the scholarship of integration, the scholarship of application and the scholarship of teaching. This partnering model developed by a public school teacher-researcher and a university education faculty member demonstrates an overlapping of service with action research by university and school educators. The model is collaborative in nature and interdependent upon the direct participation of graduate school of education pre-service students, school and university teachers and administrators. The model also fosters a recursive process by which there is the initiation of inquiry within the school environment that prompts discovery and integrates the research findings as new ideas into the practice of teaching. This recursive process, in turn, generates new inquiries which lead to new discoveries and ideas. Because the action research conducted within this model stems from the personal and professional goals of the teacher practitioners, the findings from the research support their practice, foster inquiry that is unique to their population and culture, and promote personal transformations as applied within the educators' communities. As a result, research and practice are integrated in that research is not conducted without the notion of how it will effect and transform the participants' practice and contribute to the literature as a model for others. Because pre-service students and university teachers also engage in action research with school educators, they are provided unique opportunities to recognize and participate in authentic research that transforms practice in an immediate and tangential fashion. This partnership, therefore, embeds educational research theory with actual practice and empowers the pre-service students' knowledge of and interest in authentic research.

INTRODUCTION

Action research enables teacher practitioners the opportunity to generate an inquiry within their own particular area(s) of interest and discover implications for change or development related to their teaching environment. This paper describes how one Teacher-Research group in an elementary school investigated what happened when their fourth grade students worked in student learning teams to research and produce a multimedia presentation on the solar system. The group's findings helped generate and infuse new ideas into the school's practice of integrating technology within the curriculum. The paper also describes the collaboration of one pre-service student research group with technology expertise and their university instructor, who worked with the elementary school Teacher-Research group. This field experience research model within a graduate school of education formed a partnership with school and university practitioners, and graduate school of education pre-service students who are involved and interested in similar personal inquiries related to the educational environment.

Benefits of the Partnership from the Educational Practitioner's Point of View

Teacher-Research began at Deer Park Elementary School, located in the suburbs of Washington, D.C. in Fairfax County, Virginia, during the 1996-97 school year. The technology resource teacher, Diane DeMott Painter, a member of the Teacher-Research Network in Northern Virginia with several years of teacher-research experience, started the school's Teacher-Research Team (TRT) with five other teachers. Because the school is a technology focus school, there were several members of the team interested in studying what happens when students use technology integrated into the curriculum. During that first year, Painter teamed with a fourth grade teacher, Patrick McInerney, to study the roles children take when working together to create multimedia presentations. They expanded their study during the 1997-98 school year to further document the roles children display in partner groups, the turn-taking behaviors

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they exhibit, and to determine how the children felt about working in student learning teams to research and create the multimedia presentations.

The Deer Park TRT also formed a partnership with Dr. Donna Schnorr, then an assistant professor of Educational Research at George Mason University, and five students in her masters level educational research class. The purpose of the partnership was to involve the graduate students in an actual school-based study designed and carried out by teacher-practitioners wanting to learn more about their technology-based educational program. Unsure of what would actually be gained by such a partnership, The Deer Park TRT had hoped for help in collecting and analyzing data, as well as an opportunity to gain feedback about their study from the university participants' points of view.

Painter and McInerney each kept a journal log of observations and reactions to what they saw happening when fourth grade students worked in partner groups to research the nine planets of the solar system and create informational hypercard stacks on Macintosh computers using HyperStudio, a multimedia presentation tool. Painter also kept a checklist of observable behaviors that contained categories of roles that she had observed with the fourth grade students the year before. She wanted to discover to what extent the next year's fourth grade students exhibited those roles. The roles were: 1) the idea person (visionary) sees the big picture but is not too detail-oriented in terms of content or design of the stacks; 2) the architect/designer is mostly concerned with the layout or design of the stack rather than the content; 3) the explorer/tinker is a risk-taker, exploring and tinkering with the program to figure out how things work; 4) the builder knows how to create the stack and is methodical about putting it together; 5) the information organizer tends to rely on the partner to construct the stack, preferring to gather and organize information for the content of the stack; and 6) the lost soul shows no effort to gather information, build or design the stack but seems content to observe the partner doing most of the work.

In order to determine if there was a correlation between students' attitudes toward paired work and their achievement on their HyperStudio stacks, Painter devised a likert-scale attitude survey consisting of twelve questions. McInerney devised a rubric scale to grade the components of the HyperStudio stacks. McInerney also video-taped partner groups to determine their interactions at the computer. He was most interested in knowing how students determine who would control the keyboard and the mouse when constructing the stacks. The school's librarian was interested in determining how the students conduct their research for projects and what extensions to their learning may take place as a result of their research.

The five university students each came into the elementary school on one or more mornings to observe the thirty-six partner groups in the four fourth grade classes completing various tasks such as using the Internet and trade books to gather information on the planets; taking notes on index cards; and constructing their stacks. The university students served as unbiased observers and evaluators. Their notes on the interactions were most valuable in the collection of the multiple sources of data such as determining the roles students took in stack development, and the types of turn-taking interactions that occurred between partners while working at the computers. The university students also scored the stack rubrics to determine an unbiased achievement score which could then be compared to the fourth graders' attitude scores on the likert-scale. The attitude surveys' scores were obtained by Painter who used a spreadsheet program to tally the responses to obtain an attitude score for each student.

Data analysis determined that the majority of fourth grade students fell into two or more role categories: the builder category (80%) and the information organizer category (72%). Just over half the students exhibited architect/designer roles (58%) and to a lesser degree, students demonstrated the roles of explorer/tinker (22%); idea/visionary (17%) and lost soul (14%). It was also determined that when students needed to decide who would be in control of the computer, they demonstrated one of three turn-taking behaviors: 1) productive-turn taking (students take turns "driving" the computer, but the non-driving student stays actively involved in the work at hand by offering suggestions and intellectual support); 2) unproductive turn-taking (students go through the motions of taking turns without true collaboration taking place); and 3) flexible collaboration (students are not so concerned with who is

driving the computer, they switch tasks as necessary while both are constantly vested in the development of the project. The librarian found several extensions of research behaviors among partner groups. She noted as an example, that one partner group became interested in asteroids as they were researching the planets and chose to include that information in their stacks.

Because the university students were being trained by Dr. Schnorr to run statistical tests, they used the attitude and rubric scores to run a Pearson correlation to determine the relationship between attitude toward paired work and their achievement on the Hyperstudio Stacks as measured by the students' rubric scores. No correlation was found between the students' attitudes toward paired work and their achievement on the HyperStudio stacks. It was found that most of the fourth grade students had strong positive feelings about working with a partner on the project and that those feelings had no bearing on whether the partner group obtained a high or low score on the project itself. The university students' insights about these findings were helpful to the teacher-researchers because they suggested ways that they may improve the scoring of the stacks. The university students suggested that the stacks were too subjective. For example, the university students had to give a score to such statements as 'the facts are significant and meaningful' and 'the stack is imaginative and catches the reader's attention.' What constitutes "significant" and "meaningful" information? What makes a stack "imaginative" and "catchy?" The university students concluded, "This is a major area that can be controlled in future research by more narrowly defining the definitions by which the stacks will be graded to make the rubric less subjective."

The university students also extended the study by posing a follow-up question of their own on whether gender had any impact on attitudes toward paired work or quality of the product. Although they found no correlation when rubric scores were compared in relation to gender, they did find differences between certain classes on attitude and rubric scores. For example, in one fourth grade class when females were paired with females and males were paired with males, the class obtained the most positive attitude scores for both females and males as compared to females and males in the other three fourth grade classes. However, it was noted that although the males in that class had the best attitude scores when compared to males in other classes, they also had the lowest rubric scores. The university students suggested that the males in that class may have enjoyed the socialization of working with a partner, but may have had trouble staying on task to complete a well-developed product. In another class the teacher had paired boys with girls to form the partner groups. In that class both boys and girls had lower attitude scores when compared with boys and girls in the other classes and their rubric scores were also weaker. The university students concluded that "students in fourth grade may prefer working with a partner of the same gender" and the fact that they were paired in different gender groups may have affected their attitudes and the quality of their projects.

The university students' review of the literature gave the teacher-researchers additional information about the benefits of cooperative learning groups that they may want to consider when pairing students in student-learning teams. Points made by the university students in their research paper for their graduate class were based on the findings in several studies that suggest students working in cooperative groups perform significantly better on achievement and interaction. Their literature reviews included Vygotsky's theories of situated learning (both social interaction and cultural context are integral to cognition); the relationship between constructivism and cooperative learning as noted by the theories presented by Piaget and Bruner; and attitudes and cooperative learning as noted in studies by Kirk and Barfurth.

When reviewing the benefits of involving the university students in the school-based teacher-research project, the TRT members concluded that the model:

- Enhances the research process by interactions between and feedback from pre-service students who serve as participant and non-participant observers.
- Provides a comprehensive point of view associated with the research process, data collection, and analysis that is supported by an unbiased, outside observer.

- Facilitates the ability to comprehensively collect data, and analyze and synthesize information for conclusions and implications for further research and program development.
- Enriches educational research by specific areas of expertise and time that can be devoted to such tasks as developing a literature review, scoring rubrics, conducting teacher interviews, transcribing data, and collaborating in statistical analysis.

Benefits from the Teacher Education Faculty's Point of View

The Field Experience Research Model (FERM) began at George Mason University (GMU), Graduate School of Education (GSE), located in the suburbs of Washington, D.C. in Fairfax County, Virginia, during the 1996-1997 school year. The co-coordinator of the secondary education program, Dr. Schnorr, and research instructor, started FERM with the support of other faculty members and the Director of Teacher Education, Dr. Mary Ann Lecos. Because the GSE teacher education program was selected as a Professional Development School (PDS), formal partnerships for teacher preparation at the high school level began in 1993 with federal funding of the Language Minority Project. A major purpose of this grant was to improve the ability of English, Mathematics, Social Studies and Science teachers to work effectively with the growing number of Northern Virginia high school students who speak English as a second or third language. In 1993, the Secondary Education faculty worked with teachers and administrators from the five high schools in Arlington and Fairfax having the highest numbers of language minority students to review and revise the Secondary Education coursework, field experiences and internships. Under the guidance of Dr. Lecos, a variety of partnership activities were established between the Secondary Education program and these local schools. FERM was established as an additional partnership activity that produced continuity within the teacher pre-service graduate students' field experiences by providing experiential and on-going opportunities to work with teachers on real professional school-based projects throughout pre-service teacher education students' course preparation. The various service-based projects would lead to inquiry driven research and assessment of middle and high school learner outcomes based upon project implementation. That is, the service projects are not designed and developed without the view of how research will both support that design and assess the intended learner outcomes after the project has been implemented in the school or classroom.

Pre-service students work collaboratively with teachers in the field on projects that represent professional interests and expertise of both the teachers and the pre-service students. It is particularly important to align the service and research projects with the goals and objectives, projects, programs, and/or trends that are already occurring within the school culture. For example, pre-service students have worked with one school assessing the benefits of their conflict mediation program. This line of inquiry was requested by the team of teachers who developed the conflict mediation program within this school. Another example comes from an evaluation of a school's integrated Biology and Algebra 1 course called the PRISM (Promoting Research by Integrating Science and Mathematics) project, which was developed by a team of teachers. This pre-service education student utilized both quantitative and qualitative data to comprehensively explore learner outcomes and attitudes of those high school students who participated in PRISM. A third example can be found when a pre-service student worked with a team of teachers on assessing the best way to use extra time at the end of the school day to support language minority students. A fourth example, as outlined in this case study, can be seen with the original line of inquiry brought about by the teacher-researchers who posed the question "what happens when elementary students work together to research a topic and produce a multimedia presentation?" The connection between teachers and pre-service teacher education students was established by distributing surveys to the teachers that ask such questions as "what are your professional interests?", "are there professional projects on which you are currently working?", "would you be interested in receiving support from and collaborating with a GSE student on such projects?". Pre-service students are then able to select the teacher(s) with whom they are interested in working. This represents a component of constructing a motivational environment in that the personal goals of both parties have been considered and aligned (Ford, 1994).

Pre-service students become active participants within the schools as a result of the collaboration on service and research projects, as opposed to passive observers in the traditional Field Experience model. As a result, students are able to learn about the culture of the schools because of their intimate involvement with teachers and administrators on significant and authentic projects. Secondly, pre-service students are able to gain professional identities as a result of their expertise, authentic product development, and collaboration with teacher practitioners. Thirdly, through participating in FERM and while collaborating with classroom teachers, pre-service students have the opportunity to develop an authentic product, one in which they will actually be able to implement and modify as a classroom teacher. As one pre-service student involved in FERM stated "as I got more involved in the [FERM] project, as my perceptions opened up I started to view the school setting differently. I started reevaluating some of my assumptions about teaching, time and learning. I began to see the connection between theory and real life, between reform trends in general and the specific needs of one school....In many ways I think I learned more by doing this than any of the other things I had initially considered." Additionally, as a result of the collaboration with teachers and local agencies, pre-service teacher education students' products were enriched and the level of professionalism and practical value enhanced. Finally, because of the ongoing partnerships and collaboration associated with FERM, teachers and pre-service teacher education students develop relationships that support such areas during their field experiences as mentorships, team-teaching opportunities, real teaching practice, and, ultimately job opportunities within the schools where the pre-service students are intimately working. Pre-service teacher education students, while working within FERM, gain perspective and actual problem solving practice as a teacher while utilizing classroom theory.

Teachers benefit in that they are provided support by the pre-service students because of the students' current interaction with educational theory through participation in graduate coursework. Moreover, pre-service students have the opportunities and resources to analyze the literature on any given topic, and collect current and comprehensive information as it relates to the professional project on which the teacher and student is working. Teachers are impressed with the amount of time that pre-service teacher education students are willing to give toward their field experience when working within FERM. This extra effort and motivation on the part of the pre-service students seems to occur because the goals of both the teachers and students are considered, and the products developed from the partnerships are meaningful and serve a unique purpose to the school or community. This creates a motivational environment for both the pre-service students and the mentor or cooperating teacher. As noted by a teacher working within FERM with a pre-service teacher education student, "[name of student] spent well over the required time at [name of school]. It was a wonderful experience to share ideas and learn from each other. Thank you for the opportunity to work together. I enjoyed working with [name of student]! Additionally, teachers working within FERM noted that the pre-service students with whom they collaborated developed products that were useful to them as teachers and demonstrated ways that pre-service teacher education students were engaged in typical teacher preparation activities. Finally, teachers working within FERM were better able to assess pre-service students' teaching skills as opposed to the passive observational model that typically occurs during field experiences when relationships are not established between the teacher and pre-service student.

The pre-service teacher education technology research group began its work with the teacher-researchers during their participation in the research course. The teacher-researchers were looking at "what happens when Elementary students work in teams to construct multimedia projects on the solar system?". The pre-service technology research group truly began to engage in disciplined inquiry generated by the social-cognitive modeling of the teacher-researchers' own reflective practice. As a result, the technology research group began asking its own research questions as an extension to the questions posed by the teacher-researchers. The technology research group began exploring research conditions and inductive reasoning in a direct and active fashion as they were exposed to the impact and utility of research on the teacher-researchers' own professional practice. A key component of FERM is that pre-service students recognize that the creation of such innovative projects and teacher activities as "having elementary students work in teams on hyperstudio projects", should not be done without the understanding of how learning theory supports those activities. Furthermore, the students learn how research provides the

means for assessing learner outcomes and reflecting upon one's professional practice. This type of exposure for pre-service students will solidify their coursework theory in a way that demonstrates its purpose through teacher application while increasing the analytical, synthesis and evaluation skills as they ask such questions as "what am I trying to accomplish?", "how does learning theory support this?", "what are the outcomes?", and "what do I need to modify within my own practice as a result of what the research has shown me?".

When reviewing the benefits of partnering pre-service students with the teacher-researchers, the University Professor and students concluded that the model:

- Brings an authentic context to the research course by combining theory with practice.
- Expands the faculty's and students' awareness of school/teacher needs and goals.
- Gives meaning to the partnerships and to research in the sense that students and faculty become involved with transformations within the community.
- Creates enriching and exciting research products that add to the literature and benefit the community.
- Encourages teacher education students to publish their products, thus enabling them to have ownership of their work.
- Expands the walls of the classroom and the research audience beyond the university teacher and course.
- Creates situations by which pre-service students actually engage in inductive and deductive reasoning associated with research methodology and data collection, rather than learning about this form of reasoning in theory.
- Provides growth in research skills because the authentic research inquiry catalyzes a variety of research methodologies and designs, rather than imposing specific research methodologies upon the students participating in the research course.
- Transforms the school and university faculty and students in that multiple perspectives help broaden and enrich the research process.
- Enables an interchange of skills among school and university teachers and students that enriches the research process.
- Enables the pre-service students to recognize and understand the importance of being reflective practitioners as modeled by the Teacher-Researchers.
- Provides the opportunity for the teacher education students to establish a connection in the schools, and be seen as professionals and leaders. These students may have an area of expertise that can enrich the process for the teacher-researchers.
- Takes students beyond the superficial elements of research to a more advanced skill level because the data and findings increase analytical skills.
- Induces a level of enthusiasm for research that leads the students to participation in ongoing action research beyond the scope of the time restraints of the university course.
- Creates increased opportunities for students to actively learn about the nature and climate of the school environment because the research provides a context by which students observe and participate in the school culture.
- Presents opportunities for pre-service students to co-teach in partnerships with teacher-researchers because of the ongoing professional collaboration.
- Provides continuity between students' graduate courses as action research enables students to integrate course theory into a meaningful and applied context while recognizing connections between theories.

Implications for Further Development and Dissemination

When implementing this model, there is a need to address time restraints that occur in a formal university course syllabus and within the educational environment in order to combat artificial research and make it truly authentic. Additional time as required outside of the classroom is often needed for all participants to create change and meet the goals of the partnership. Since research is not separated from transformations to practice in this model, the partnership and research are fueled by time that goes beyond the university course completion.

There is also a need to recognize that authentic research may mean that some of the necessary research skills go beyond the scope of the objectives of the course and necessitate collaboration with other professionals outside of the partnership. Creative ways of communicating within the partnership and between all participants need to be found: (e.g., The university's electronic bulletin board [see examples of dialogue that ensued during this partnership activity through the university's Townhall chat room], e-mail, FAX, mail, face-to-face meetings). Project funding may need to cover expenses such as photocopying, mail-outs, meeting times, and the funding sources may be grants. Clear and definite collaboration among participants needs to be fostered with the understanding of how each participant involved can support and learn from one another. Finally, a new paradigm needs to be created for such reward structures as university and school faculties' tenure that aligns with the Carnegie Foundation's view of scholarship; recognizing activities and accomplishments in the areas of discovery, integration, application and teaching.

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Contributors

Diane DeMott Painter is a technology resource teacher at Deer Park School. Fairfax County Public Schools. Virginia. She earned a Ph.D. in Special Education Technology from George Mason University in 1994. Currently she serves on the Board of Directors for the Society for Technology in Education (VSTE) as the Elementary Director. and she is the acting Research Editor for the VSTE Journal. To contact Dr. Painter. email her at dpainter@fc.fcps.k12.va.us.

Donna Schnorr is Assistant Professor in the Department of Educational Psychology and Counseling at California State University (CSU). San Bernardino. She earned a Ph. D. in Education from George Mason University in 1998. where she initiated the Field Experience Research Model as Co-Coordinator of the Secondary Education Program in the Graduate School of Education. Dr. Schnorr also specializes in interactive web module development for teacher education courses. Currently she teaches Educational Psychology and Instructional Technology courses at CSU. To contact Dr. Schnorr. e-mail her at dschnorr@csusb.edu