

EFFECTIVENESS AND QUALITY OF ALTERNATIVELY PREPARED MATHEMATICS TEACHERS

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Through this discussion group on effectiveness and quality of alternatively prepared mathematics teachers, we will provide a forum for discussing ongoing research studies in this area. Focal discussion points of interest to participants will be use to guide the direction of the session. After the organizers of the session share their ongoing research, the working group will engage the participants in discussion based upon the participants' research and interests. It is expected that major themes will evolve. These themes will guide the future directions for the continuation of this group within PME-NA.

Introduction

Given the influx and impact of alternatively prepared teachers in K-12 mathematics classrooms across this nation and the documented lack of research on the effectiveness and quality of these teachers (Goldhaber & Anthony 2003; Wilson, Floden, & Ferrini-Mundy, 2001; Zeichner & Schulte 2001), we are initiating a discussion group to explore research efforts with respect to alternative preparation of mathematics teachers. Within this discussion group, researchers in mathematics education who are interested in conducting studies or have ongoing research with respect to the preparation of mathematics teachers through alternative pathways will have the opportunity to share and receive feedback on their research. It is expected that a critical mass of researchers coming together in this area holds the promise of becoming a formal working group within the Psychology of Mathematics Education-North American (PME-NA) chapter.

We, the organizers of this proposed working group, have been involved in the alternative teacher preparation program in our institution and are conducting research on alternatively prepared teachers for urban classrooms. Our research is longitudinal and includes focused studies across various stages of the continuum--from recruitment into the preparation program through induction into the profession. While the context of our work is focused on urban environments, this discussion is open to all environments and contexts of alternatively prepared mathematics teachers.

Rationale for Research and Working Group

According to Wilson, Floden and Ferrini-Mundy (2001), there are higher percentages of alternative certified teachers teaching in urban settings or teaching minority children than in other settings. There is also a mixed record of the quality of teachers recruited and trained. Research about the impact of alternative certification of teachers is also limited. As a result, Wilson et al (2001) found a need for studies that are designed to include more sensitive measures (e.g. content and quality) that describe specific features (e.g. subject matter, pedagogy and clinical experiences) of alternative teacher preparation programs. Among the gaps identified, they suggest need for research across:

Pedagogical Preparation:

- For systematic and comparative research on the content of pedagogical preparation beyond lists of course titles and on the instructional methods best suited for professional teacher preparation;
- To know more about the preparation of teachers to teach diverse student populations, including those in urban and poor rural settings;
- To know more about the actual knowledge and skills that teachers acquire in their education coursework and associated experiences;
- To know more about what teachers learn in subject matter education courses and how that professional knowledge compares to subject matter preparation of an academic major;

Clinical Experiences:

- To know more about the impact of innovative field experiences on new teachers' effectiveness;
- To know more about the relative impact of various types of field experiences: early field experiences, field experiences integrated into particular university courses, student teaching, and yearlong internships;
- To know more about the relative contributions of coursework and fieldwork to a teacher's progress in learning to teach, more about the ways in which the coursework integrates into the fieldwork, and under what fieldwork conditions the novice teachers are most likely to continue to learn productively;

Alternative Certification:

- To describe the content and components of high quality alternative certification programs;
- To document and analyze the professional knowledge (both of subject matter and of teaching) that graduates of alternate routes acquire, and how they acquire it, and relate that knowledge to teaching practice;

Teacher Preparation:

- To know much more about how to prepare teachers for urban and poor rural areas and how to create policies that ensure that those children get highly qualified teachers; and
- To assess the impact of teacher preparation programs to include designs that examine impact longitudinally.

Goldhaber and Anthony (2003) claim teacher quality is the most important educational input predicting student achievement. Further, they claim that teacher quality has historically been synonymous with personal traits, such as high moral character and intellectual curiosity, while today it tends to encompass structured standards developed by the Interstate New Teacher Assessment Support Consortium (INTASC) and National Board for Professional Teaching Standards (NBPTS). The National Council for the Accreditation of Teacher Education (NCATE), INTASC and NBPTS, though they differ in some respects, share common themes about teacher quality. However, despite thinking of teacher quality as an immutable characteristic, Goldhaber and Anthony (2003) state that it is possible for a teacher who is highly effective in one setting, say a highly structured environment with explicit standards and accountability measures, to be ineffective in a more flexible environment.

In the report, *No Dream Denied: A Pledge to America's Children* (2003), "highly qualified teachers" have been benchmarked by a set of criteria that are aligned with the Interstate New

Teacher Assessment and Support Consortium (INTASC) and the National Board for Professional Teaching Standards (NBPTS). The report has also indicated “American students are entitled to teachers who know their subjects, understand their students and what they need, and have developed the skills to make learning come alive” (p. 7). Despite these claims, the report states that the nation is far from providing every child with quality teaching.

Current Work of Focus Group Organizers

Our current study is situated within the recruitment of students into alternative preparation for secondary mathematics. The purpose of our current research is to develop a research-based recruitment tool that can be used to identify potential teacher candidates who possess attributes or characteristics of becoming high quality mathematics teachers for urban schools. Our research question is: *How can a recruitment tool be developed to facilitate identification of potential high quality mathematics teachers for urban environments?*

Ultimately, our focus is to increase the number of high quality urban mathematics teachers who seek jobs in urban school districts and are committed to remain. In this light, it is vitally important for us to make informed decisions in selecting students to prepare as mathematics teachers for urban schools. Therefore, we need to understand: (1) the characteristics of high quality teachers that are pertinent to the willingness, the stamina and longevity of commitment to the urban classrooms, and (2) how we prepare teachers to acclaim those qualities. Having an understanding of these characteristics in ways that lead to the development of a recruitment tool that will assist us in identifying potential high quality urban mathematics teachers is the goal of our research. We are asking questions such as: *What does it mean to be a high quality urban mathematics teacher? What are the experiences in a typical day for a high quality urban mathematics teacher? What does the high quality urban mathematics teacher do differently from teachers in other settings?*

Focused group discussions addressing these types of questions have facilitated our progress in establishing an initial set of characteristics of high quality urban mathematics teachers. In the acquisition of characteristics of high quality urban mathematics teachers, we chose to focus on individuals who had lived-experiences through which they had developed beliefs and perceptions with respect to the phenomenon under investigation, “high quality mathematics teachers in urban environments.” In particular, this current study engages urban mathematics teachers who are considered to be high quality.

We applied phenomenology using focus groups as the setting for data collection. Researchers who use phenomenology are interested in showing how complex meanings are built out of simple units of direct experiences. That is, a phenomenological study follows the format of explicitly examining one particular phenomenon to allow carefully chosen participants to make meaning out of it (Creswell, 1998). Further, the use of focus groups allows for explicit interactions that produce data and insights that would be less accessible without the interaction (Morgan, 1988). This reliance on interaction between participants is designed to elicit more of the participants’ point of view in the context of the views of others, which would be evidenced in the more researcher-dominated interviewing (Mertens, 1998; Patton, 2002). As a result of this initial phase in the research process, we have produced and categorized a preliminary list of characteristics of high quality urban mathematics teachers.

While the initial step has produced pertinent information that will be used in the design of the recruitment tool, this research study includes several stages that will build upon our initial work over the next three years. Participants are engaged in the research through: (1) focused group

interviews for the purpose of defining characteristics of high quality urban mathematics teachers, (2) collaborative efforts for developing and refining items for the recruitment tool, and (3) validation of the recruitment tool. This study uses a mixed-methodological analysis that began with qualitative methods and will lead sequentially to quantitative methods in the development and validation of the recruitment tool.

Plans for Engagement of Participants

In this first session, the organizers will begin by sharing the background of the alternative preparation program of their research, the research design, and the progress of the current research on recruitment. During PME-NA XXVI Toronto, the organizers engaged in informal conversation with conference presenters whose presentations focused on alternatively prepared teachers. Through informal conversation, we found an interest among the researchers for this discussion group. In this session, researchers will be invited to share their work with the whole groups as well as in small group discussion.

After ongoing research has been shared and discussed, participants will have time for questions and answers. The participants' areas of research and interest will be recorded prior to establishing breakout sessions. Therefore, there will be an attempt to form as best as possible small discussion groups by topics within a manageable numbers. After the breakout sessions, group reporters will share pertinent points discussed, issues raised, and the group's decision for the future directions of this working group. Some of what is expected to be accomplished in the discussion group includes:

- Engagement in a format for rich discussion across common themes
- Sharing descriptions of alternative pathways into mathematics teaching
- Sharing ongoing research and research interest areas of common interest
- Reporting out from the discussion groups
- Examining theoretical conceptual frameworks
- Examining research questions and research designs
- Discussing ways in which research can impact the quality and effectiveness of alternatively prepared mathematics teachers
- Sharing ways in which we can move this discussion forward and establish steps for further dissemination of the ongoing research of this discussion group
- Establishing next steps for the longevity of our work and this discussion group within PME-NA.

Types of question that may be used to open and guide discussions are:

- What is alternative certification?
- What are common components across alternative certification programs for mathematics?
- Should an alternative certification program place more emphasis on content knowledge or pedagogy in the preparation of mathematics teachers?
- Is alternative preparation an effective means to addressing the problem of teacher shortage in mathematics?
- How do alternative certification programs prepare high quality mathematics teachers?
- What examples of effective alternation preparation programs are in existence and what are the features of the effective programs that prepare teachers of mathematics?
- What is the duration of an alternative certification program that prepares high quality mathematics teachers?

- What does research about retention report about the longevity of alternatively prepared teachers?
- Should alternative preparation programs be context specific?

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