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ABSTRACT

This is one component of an in-depth, longitudinal case study investigating the deliberate attempt to infuse a science multicultural perspective throughout an elementary teacher education program at a major research university. Intending teachers' perspectives of being inducted into a profession overtly signifying its commitment to multicultural awareness and action were documented during their methods experience, their student teaching experience, and during the first few years of their teaching practice. The focus in this paper is the student teaching component for 40 prospective science teachers. Data sources were individual semi-structured audiotaped interviews. Data were analyzed through standard qualitative techniques to generate insights for science teacher educators. Implications for science teacher education focus on the assertions that intending teachers bring multiple perspectives to their teaching and that these perspectives face a commitment test during the student teaching experience. In addition, intending teachers discovered during student teaching that the schools in which they were placed did not really value science teaching. (Contains 2 figures and 16 references.) (Author/SLD)

Researching The Induction of Intending Elementary Science Teachers In Multicultural Settings: The Science Student Teaching Component

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Abstract

This is one component of an in-depth, longitudinal case study investigating the deliberate attempt to infuse a science multicultural perspective throughout an elementary teacher education program at a major research university. Intending teachers' perspectives of being inducted into a profession overtly signifying its commitment to multicultural awareness and action are documented during their methods experience, their student teaching experience, and during their first few years of teaching practice. The focus in this paper is the student teaching component. Data sources were individual semi-structured audio-taped interviews. Data were analyzed through standard qualitative techniques to generate insights for science teacher educators. Implications for science teacher education focus on these assertions:

Introduction

Induction is the planned and organized orientation to the demands and responsibilities of teaching (Ashburn, 1987). Typically, the focus of the induction of teachers is the first year of full-time teaching (Burden, 1982) or the first few beginning years of employment (Huling-Austin, 1988). However, inducting new practitioners into the teaching of elementary science (a subject identified by the majority of intending elementary teachers as being exceptionally threatening due to their lack of content confidence) (Baker & Saul, 1994, p.1023) while also inducting them into multicultural settings (another area intending teachers perceive as threatening due to their lack of cultural confidence) can begin during the teacher preparation program. In this study, the argument is made that a more complete documentation of the "induction" of elementary teachers of science *into multicultural settings* begins by examining their beliefs and attitudes during their science methods course which focuses on the teaching of science to diverse young learners. Subsequent on-going studies will document intending elementary teachers of science development in this area of interest during their student teaching and their first few years of full-time employment. This type of research study is of considerable current interest as researchers strive to document intending teachers movement from "peripheral" participation (Lave, 1992) to full-fledged participation in teaching, particularly in multicultural settings (Larke & Bradley, 1990; Nel, 1993; Reed, 1993).

Methods

The interpretative research methods employed in this study were guided by Erickson (1986). The intent was to focus on "the meanings of actions, as defined by the actors' points of view " (p.119). It was conducted within a constructivist paradigm which was guided by an associated set of ontological, epistemological, and methodological beliefs (Guba & Lincoln, 1989). Namely, as principal investigators, we assumed that there are multiple realities which can be socially constructed, ours would be but one. And, we believed that our findings would be knowledge claims or constructions which

would we would negotiate among ourselves by using the data we collected in the setting in which we worked.

Study Site and Participants

The site of this investigation into the perspectives of a sample of forty intending elementary science teachers on their preparedness to teach multicultural education was an elementary teacher education program science methods course at a major American research university in the Mid-Atlantic Region of the United States. The participants' science methods class was taught in the spring, 1994 and in the fall, 1994 by one of the principal investigators of this study (McGinnis) and field supervised by the other principal investigator (Davis) A smaller sample of three, continued as research participants in the fall, 1994, and a sample of 4 continued as research participants in the spring 1995 during their student teaching experience. Participants were invited to continue in the study due to their diverse points of view regarding multicultural education (supportive and non-supportive) and due the diversity of their backgrounds and ethnicity. The researchers were not involved with the teaching or supervision of the student teaching experience.

In their method class, the participants were enrolled in the course, one of five required methods courses which the intending teachers take as a "Block" during the same semester. The course included university instruction twice a week on campus and a two-day a week internship in public elementary schools. The elementary schools in which the science methods interns were placed were selected for use by the university upon consideration of many criteria, one being that they included significant representation of students of diverse backgrounds (African-American, Euro-American, Hispanic).

In their student teaching experience, the participants were assigned to cooperating teachers who worked in elementary schools in geographic proximity to the university.

The intending elementary teachers voluntary participating in the methods component of this study represented diverse groups (ethnic, gender, religion, and SES). In cohort #1 (those enrolled in

the spring, 1994 class) there was one male student and nineteen female intending teachers. They described themselves as members of a range of religions (including Judaism, Christianity, and Islam) and representing a range of socio-economic levels. In cohort #2 (those enrolled in the fall, 1994 class there were twenty female intending teachers. Once again, the students described themselves as diverse in ethnic, religious, and socio-economic backgrounds. The white male science methods instructor and the female African American doctoral student in education were the principal investigators and data collectors in this research study.

Student teachers who continued to participate in the study from cohort 1 included three females (1 African-American and 2 Euro-Americans). Student teachers who continued to participate in the study from cohort 2 included four females (2 Hispanic-Americans, 2 Euro-Americans).

Data Sources

The participants of the student teaching component of the study engaged in semi-structured interviews with one of the principal investigators (Davis). Figure One contains the questions protocol administered at the beginning of the semester. Figure Two contains the questions protocol administered at the end of the semester.

During the methods portion of this study (McGinnis & Davis, 1995) participants wrote their responses (reflections) to instructor directed journal questions concerning the importance of infusing multicultural education into the elementary science curriculum throughout the semester. The participants also engaged in a mandatory beginning of the semester multicultural education workshop which took as its focus a sharing of their heritage, diversity, and personal interest in science. Participants were asked to complete a survey at the beginning of the workshop. During the workshop, participants responded to questions asking them to share information on their backgrounds. They presented their responses in small group poster displays that were collected for later analysis.

Upon completion of the workshop, participants completed another survey.

During the methods semester, a sample of the participants (individual and small group) were interviewed at the beginning, middle, and end of term. The interviews used three semi-structured protocols and were audio-taped and transcribed. The questions focused on their perspectives of infusing multicultural education throughout the science curriculum. In addition, ongoing comments made during discussions and during science microteaching experiences in the science methods class were noted and recorded by the instructor and another researcher invited into the class by the instructor. These notes were included in the analysis of data. During a class session on "Multicultural education and science teaching" participants drew their individual vision of a "scientist" and described that drawing to the class. These drawings were collected and included in the analysis of data. Participants also were observed throughout the semester in their two-day a week elementary school placements. Field notes of those observations were also included in the data analysis.

Data Analysis and Interpretation

Data were analyzed throughout the study by the principal investigators. The analysis and interpretation process consisted of reading and examining collected data (survey responses, journal entries, field notes, and participant artifacts) and formulating tentative assertions that were negotiated among the principal investigators. These tentative assertions were then tested by many sources in the data set. This iterative process of phases of interpretation, critique, and re analysis became a hermeneutic cycle that resulted in the emergence of joint constructions of one possible view of the intending teachers' discussion and actions during their student teaching experience.

Preliminary analysis of the wealth of data indicated that there were regularities in the participants' attitudes, beliefs, and performances related to multicultural education. In the sections

below, selected participants' voices are presented in support of two assertions emerging from this study:

(a) *Multicultural awareness among intending elementary teachers of science proceeds in an evolutionary fashion. In the student teaching experience, the intending teachers became aware that it requires a personal commitment.*

(b.) *To enact science instruction in school settings that includes multicultural considerations, there is a need for a multicultural resource center*

Assertion One: *Multicultural awareness among intending elementary teachers of science proceeds in an evolutionary fashion that requires personal commitment.*

Multicultural education is an educational initiative that is viewed through lenses of need by intending teachers of science. Easy entrance to multiculturalism, a concept for which exists no univocal definition at this time (see, Grant & Sleeter, 1985; Garcia & Pugh, 1992; Green, 1992; Atwater, 1993) for the intending elementary teacher of science initially involves a non-discriminatory notion in their methods classes--no learner is overtly discriminated against by the teacher in social actions. Moving toward the need to reflect on how one's teaching practice impacts students differently depending on their backgrounds, an awareness of the importance of individual student learning preferences, and the development of an interception body of teaching practice that combines science content with an understanding and appreciation of learners' diverse backgrounds is a slow and arduous journey for the majority of intending elementary teachers of science. For many, the process just started by the end of their science methods course.

During the student teaching experience the student teachers found that the school environments, while paying lip service to multicultural education, relied on individual teacher actions to enact it. This required a personal commitment to multicultural education since the extra effort was borne by the individual teacher. It was

observed that teachers who made no efforts to include student diversity in their science instruction received no sanction by school officials or by their colleagues.

Intending teachers' voices presented in telling episodes:

Episode 1
Student Teacher:
When I first went into 372, I thought that multicultural science was, uhm, teaching science, ...And when I left 372, thought that teaching multicultural science is really, uhm. changing the way you teach, changing the way you teach, changing the way you view science, and how you present science to meet the needs of multicultural students.....especially because I think it's such an important....it's an important issue (Euro-American female)

Episode 2
Student Teacher:
Well, I mean, I consider it, like, almost every lesson I do now. It's one thing that I didn't recognize in the past because I don't consider multiculturalism,..., so now I consider it and I try to incorporate it (Euro-American female).

Episode 3
Student Teacher:
I would tell then, Don't think...don't fool themselves into thinking that you're gonna have one clone students. and that all of your....the 30 students are gonna meet this one clone image that you have in your head, because the students are diverse, and that as a teacher it's your responsibility to have all areas this diversity, and if you're not willing to do that for your students, then maybe you should reconsider now before you actually go into the classroom and do more harm than good (Euro-American female).

Episode 4
Student Teacher:
I would tell them that there is a great emphasis here...but when you actually get out there you really don't see a lot of it. And maybe try to, you know, get them to think about the same things, about how they can, you know spur that in their, take the initiative, because its gonna have to be the new teachers coming out, uhm, that actually get it started because it's not there. It's never existed, and unless you have inservices or whatever, you're not (Euro-American female).

Episode 5
Student Teacher:
I may have heard about and stuff, but it never really hit me until methods, and especially in teaching at the schools...Well, in the school I was in there really, uhm, the theme is there, and you can see it...and if you can get it into your classroom, then it's a very positive reinforcement (Hispanic female).

Assertion Two: *There is a need for a multicultural resource center to enact multicultural science education in school settings*

During their student teaching experience, the intending teachers realized that even if they maintained a commitment toward including multicultural considerations in their science teaching, they needed readily obtainable multicultural resources They found that these resources did not currently exist in the schools in which they were placed, but needed to in order to enact a multicultural science focus. The student teachers advocated a multicultural resource center to fulfill this need.

Intending teachers' voices presented in telling episodes:

Episode 1
Student Teacher:

You know, uhm, our school, I guess as far as the multicultural aspect is concerned...I got most of my resources on multiculturalism just from the course that I had taken at the university...But as far as the actual; school setting, uhm, did they have a multicultural lab, no. And if they did, or maybe they did, and I just wasn't exposed to that area (Euro-American female).

Episode 2
Student Teacher:
I mean, I have some books on it, but other than that, I don't really know...it shows that there is a lack there (Euro-American female)

Episode 3
Student Teacher:
Uhm....Because there's nothing! I mean, there's this one pamphlet I saw in the front office ...I really couldn't see anything. I mean, you couldn't see these multicultural pamphlets, and there was only like two (Hispanic female).

In Conclusion and Implications

The research presented in this study focuses on one component (the student teaching experience) of a longitudinal study that has its goal to document and interpret the preparation of intending elementary teachers of science in their science methods class, their student teaching semester, and their first few years of teaching. This kind of study can meet several needs that exist in science education. The first need is to systematically document the attitudes, beliefs, and performances of intending elementary teachers of science toward teaching diverse students. The second need is to systematically document the impact of efforts to infuse multicultural education in the preparation of elementary science teachers.

The foremost concern that the beginning intending elementary teachers of science brought to their science methods course was the need for science content enhancement. The importance of studying

how to teach students of diverse backgrounds, if it existed at all, was subsidiary to that driving need. To legitimize the additionally important need to gain skills and knowledge to successfully teach students of diverse backgrounds, the impact of the science methods instructor was crucial. Intending teachers looked to the instructor as a standard-bearer of science education. Because the instructor held the belief that the successful teaching of science requires a multicultural awareness and knowledge base, the intending teachers were willing to acknowledge the issue as legitimate and tentatively consider it as a meaningful factor in their acculturation of science teaching that is effective and research-based.

During the student teaching experience, that role of the science methods instructor and the field-based supervisor declined. Instead, as researchers, the methods instructor and the field-based supervisor served to keep paramount the concept of multicultural education in student teaching school contexts that did not acknowledge multicultural considerations. The researchers did this by engaging in a conversation with the participants that focused on science teaching and diversity considerations. In their conversations, the students teachers revealed their awareness that there is lip service paid to multicultural education which is not realized in school contexts. They determined that if multicultural education is to continue, then the students must make a personal commitment to continue the fight.

Implications for this chapter in the story of the induction of elementary teachers of science in multicultural settings are seen at this point in the research study to be twofold. Firstly, intending teachers bring to their science methods' course multiple perspectives on teaching science to diverse students which evolve during that experience and face a commitment test during their student teaching experience. The intending teachers' beliefs range from treat all kids the same (universalism) to a willingness to acknowledge the impact of diverse backgrounds on the teaching of science (multiculturalism). Intending elementary teachers' attitudes toward the infusing of multicultural education in science teaching range from extremely negative (no need for it) to extremely positive (it is crucial).

Secondly, intending elementary teachers of science looked to their science teacher educator in the methods experience to alert them to the demands of teaching science but during the student teaching experience they faced the realization that the schools in which they were placed did not value science. It was not on the school schedule, and they had to take the initiative to teach it, and, if they decided they wanted to, to include a multicultural focus. Without resources or support, they most frequently did neither although they expressed the commitment to do so once they became full-time classroom teachers.

References

Ashburn, E.A. (1987). Current developments in teacher induction programs. Action in Teacher Education, 8(4), 41-44.

Atwater, M. (1993). Multicultural Science Education. The Science Teacher, 60(3), 32-37.

Atwater, M. (1993). Multicultural Science Education: perspectives, definitions, and research agenda.Science Education 77(6), 661-668.

Baker, L., & Saul, W. (1994). Considering science and language arts connections: A study of teacher cognition.Journal of Research in Science Teaching, 31(9), 1023-1037.

Burden, P. (1982). Concerns of teachers: A developmental conceptualization. Paper presented at the annual meeting of the Midwest Educational Research Association, Des Moines, Iowa.

Erickson, F. (1986). Qualitative methods in research on teaching. In Wittrock. (Ed.) Handbook of research on teaching (3rd Edition). NY: Macmillan Publishing Company.

Garcia, J. & Pugh, S.L. (1992). Multicultural education in teacher preparation programs: A political or educational concept?Phi Delta Kappan, 74(3), 214-219.

Grant, C.A., & Sleeter C.E. (1985). The literature on Multicultural Education: Review and Analysis. Educational Review, 37(2),97-118.

Greene, M. (1992). The passion of pluralism: multiculturalism and the expanding community.Journal of Negro Education, 61(3), 260-61.

Guba, E., & Lincoln, Y. (1989).Fourth generation evaluation Beverly Hills, CA: Sage.

Huling-Austin, L. (1988). A synthesis of research on teacher induction programs and practices. In J. Reinhartz (Ed.)Aspects of learning: Teacher induction(pp.13-33). Washington, DC: National Education Association.

Larke, P., Wiseman, D., & Bradley, C. (1990). The minority mentor ship project: changing attitudes of preservice teachers for diverse classrooms. Action in Teacher Education, 12(3), 5-11.

Lave, J. (1992, April). *Legitimate peripheral participation.* Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA.

McGinnis, J. R., & Davis, R.T. (1995). Researching the induction of intending elementary science teachers in multicultural settings: the science methods component. Paper presented at annual conference of the National Science Teaching Association, Philadelphia, Pennsylvania, March 23-26, 1995.

Nel, J. (1993). Preservice teachers' perceptions of the goals of multicultural education: Implications for the empowerment of minority students. Educational Horizons, 71(3), 120-25.

Reed, D. (1993). Multicultural Education for Preservice Students. Action in Teacher Education, 13(3), 27-34.

Figure One
Student Teacher Interview Protocol #1

1. Please describe your student teaching placement.

Probe: Name of school, county, cooperating teacher, description of faculty and student body

2. What notions of teaching science to all students have you brought with you to student teaching?

3. What would you still like to know about multicultural education as it relates to science teaching and where can you get that information?

4. What evidence do you see in your student teaching placement that multicultural considerations is being considered in science instruction?

5. What are you learning about using students' diversity in your science teaching?

Figure Two
Student Teacher Interview Protocol #2

1. As your student teaching experience comes to an end, what role did you see science play in the classroom in which you were placed?

2. What did you learn about using your students' diversity when teaching science?

3. If you wanted to find out something else about multicultural education or needed some multicultural resources, where would you go/who would you contact to get that information?

4. Please respond to this scenario: Let's say in the first year of teaching you go into a school where there is no acknowledgment of the students' diversity in instruction. How are you going to respond to this?

5. Finally, if you had the opportunity to go back to your university science methods class and talk to in-coming method students, what would you tell them about multicultural education and your observations of how elementary students are taught?