Learning to Become a Mentor: A Case Study of a Group of Science Teachers

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Abstract: The purpose of this study was to describe three elementary science mentor teachers' mentoring process and their own development during a year-long professional development intervention in the form of a mentor teacher study group directed toward fostering educative mentoring for student teachers. The collaborative action research was utilized to involve the mentor teachers to inquiry their mentoring. The database consisted of field notes of weekly meetings, interviews on mentor teacher, and copies of mentor and student teachers' written works on mentoring. Triangulation was conducted to enhance the validity. During the mentoring, the mentor teachers interviewed student teachers to know their background and experience for planning mentorship, provided observation schedules for student teachers to observe mentors' science teaching, discussed student teachers' science lesson plans, and observed student teachers' science lessons and gave feedback. The mentor teachers reported that serving as mentors enhanced their collaboration with other members of this study group and added new instructional strategies to their teaching repertoires. The mentor teachers reflected and discussed on both their science instruction and mentoring that were beneficial to mentors, student teachers, and their students. This study contributed to the research on educating student teachers to become real practitioners and on the mentor teachers' development.

Keywords: Collaborative Action Research, Professional Development, Mentoring for Science Teaching

Introduction

Mentor teachers play a central role in the development of student teachers (Podsen & Denmark, 2000). Mentoring can not only have an effect on the development of the student teacher but can have an effect on the mentor's development (Hawkey, 1997；Huling, 2001). Mentors can build a knowledge base about how to work effectively with the student teachers (Kerka, 1998). After watching the student teachers implemented research-based repertoire of teaching strategies and seeing the response of their own students to these methods, mentors may try out some of the methods themselves (Elliott, 1995).

If there is not a well-developed mentoring, the development of student teachers and mentor teachers may be problematic. In our country, student teachers had a period of

school-based experience prior to receiving their teaching certificate. However, there is little role for the university supervisor or, even less of a role for the new, research-based ideas that the student teachers might want to use. Many student teachers found themselves learning-on-the-job with a narrow repertoire of teaching strategies and even less experience in making the connection between theory and practice through reflection (Lin, 2005).

The science education department in our college applied a new program and mandated a change in elementary teacher education. Student teachers must work with mentor teachers and be supervised by university faculties. Mentor teachers assess the needs of their student teachers and develop a plan for sharing their expertise based on these needs. Theses needs often relate to helping those student teachers to inquiry science instruction with setting up experiments, sharing lesson plans, and giving feedback on performance for inquiry science. Mentors are encouraged to promote their reflection regarding the effectiveness of science instruction and mentoring. Obviously, this new model requires a different role for the mentor teachers and this model was not the way these mentor teachers themselves have been educated to become teachers. The purpose of this mentoring program is to leverage the investment made in these mentor teachers by supporting their efforts to share the knowledge and skill they have gained with students teachers in their schools. In this paper, we are focusing on the description and explanation of these mentor teachers' mentoring process and their own development.

Design

Collaborative Action Research: The collaborative action research was utilized to involve the mentor teachers to inquiry their mentoring. The steps included the ongoing practice of the teachers and defining problems, the actions to solve the problems, changes in practice, and new actions resulting from participation in the collaborative group. The collaborative action research allowed participant teachers and researchers to learn more about their practices and providing a forum in which to try new strategies, receive feedback, and reflect on what was learned in the process.

Collecting and Analysis Data: The database consisted of field notes of weekly meetings, interviews on mentoring, student teachers' written works, and the data from questionnaire of student teacher's perception on mentoring. By comparing the above data sources, field notes of weekly meetings were important because mentor teachers were able to express their concerns and successes in working with the student teachers. In combination with the meeting notes, interviews, related documents, and result from survey provided a reliability check for the findings.

Findings

For convenience in the discussion, the overall research process was divided into five chronological phases.

Preparing Phase: The participant school was located in a rural area about twenty minutes east of the university. It consisted of about 1500 somewhat homogenous middle-class students. The school provided an extended 5-week field experience and a 10-week student science teaching experience for interns. The four teachers taught science at this elementary school were invited to conduct this research after being contacted by the university researcher. All of the participants involved had a variety of questions and concerns on mentoring for student teachers. The university researcher's major role in this group was to provide new trends of teacher education, theory of teacher learning and development, literature on mentoring, and some support for the teachers in this group both as a source of ideas and suggestions during the study. Tai familiar with the action research process and the mentoring process from prior studies acted as a consultant in this study. Lin, Liu, and Din had taught science for 6 to ten years and had mentoring experience for student teachers for at least three years in their school. All the members agreed that the major purpose of this group was to make a more effective science mentoring in the school in the initial meeting in September of 2004.

The group meetings were scheduled every week throughout the study. During group meetings, participants could make plans, asked and answered questions, discussed problems, and expressed reflections. The group setting was conductive to the generation of new ideas, strategies, and techniques used to initiate actions, direct the research, solve problems, and ultimately achieve the purpose of this group. Through the process, the mentor teachers adjusted their practice through reflectively informed changes in their behavior.

Baseline Data and Defined problems: Baseline data answers the question, "What is the current situation in regard to science mentoring for student teachers in the school?" The participants gathered information on what was currently being implemented, what plans were already in place, as well as the feelings of participant teachers and administrators toward the science mentoring for student teachers. This information constituted our baseline data and would be used for comparative reflection at the end of the cycle. The following were problems they defined from the baseline data:

- Involvement: Student teachers were not fully involved in science internship.
- Communication: There was not a good communication channel between mentor and student teachers.
- Student teachers teaching quality: The problems identified included managing class time, running out of materials or activities before the end of class, misconception of science, and setting up, managing and assessing science investigation.
- Feedback and assessment on student teacher performance: Mentors did not provide timely, descriptive, and specific feedback on student teacher's performance.

Planning: During the weekly meetings, the participants reviewed related literature on mentoring. Some of the information included: research findings of mentor and student teachers, professional standard of science teaching, and mentoring for student teacher. After

reviewing others work, the mentor teachers spent lots of time to figure out the possible strategies for the problems they defined in the first phase, for example,

- Increasing involvement: The mentors tried to clarify the purpose of mentoring and sequence the student teaching experiences.
- Promoting communication: The mentors created a connection, promoting communication strategies and skills, and increased understanding and mutual respect.
- Improving student teachers teaching quality: The mentors discussed the student teacher's plan in advance of the lesson for checking the understanding of student teachers and pointedout the potential problems before they happened.
- Assessing and giving feedback on student teacher's performance: The mentors collected data on observation, gave feedback in the post observation meeting, and encouraged novices to reflect on their teaching in the mentor-mentee interaction diary.

Intervention strategies/Baseline data: In intervention Actions, mentor teachers set aside time for a short private interview to get to know their student teachers at their first meeting. They also centered on discussing specific goals and objectives about the novice's performance. The mentors sequenced the student teaching experiences. They provided student teachers with lesson plans, related books, and other materials so the novices could begin to become familiar with the science curriculum and invited student teachers to observe the mentors' classes. The student teachers were required to complete a set of written activities based on observation and discussions with the mentor teachers.

For minimize the harmful effects on pupil learning and monitoring the quality of student teachers teaching, mentors asked the mentees to plan detailed lesson before teaching and reviewed it carefully. All the mentors believed planning gave the beginner the needed structure to design a lesson, and they ensured that no essential parts have been overlook. Some mentees did not meet the requirement. The reasons were that the planning and reviewing were time-consuming and that mentor teachers would not develop detailed plan in real teaching practice. Not surprising, maintaining learning environment became difficult and their students messed around in the student teacher's class.

During the classroom observation, the mentor teachers recorded patterns of teaching and learning, analyzing data to identify teaching strengths and growth areas. The mentor teachers held meetings to enable the student teachers to reflect on the teaching performance based on the classroom observation.

Time was the significant factor that hindered communication between mentors and mentees. The mentor-mentee meetings often held after class until 5:00. E-mail was one solution that the mentor teachers considered, but the student teachers was too busy to complete the written activities based on teaching and discussion with their mentor teachers

with reflection until the end of the internship.

Regardless of the time difficulty, the mentor teachers had established a positive relationship with their student teachers. Mentors were willing to share ideas freely and they were able to adopt some of mentees' ideas as well. The student teachers asked many questions, took time to observe mentor's science class, and received resources from mentors that they could learn from. The student teachers also reported that the mentoring is beneficial to them, saying it helped them to grow professionally, develop a clearer idea of real science teaching.

Reflections and planning for next cycle: Reflection began in March of 2005 and provided a summary of the situation at the end of the cycle. The experience had been a positive one for mentor teachers. For example,

> ” After serving as a mentor, I returned to my classroom with a renewed attitude. Working with the mentees helped me to reflect on what I did as a teacher and why. This reflection led to better ideas to learning and teaching for my students.”

> ” In mentoring student teachers, I have learned that I have effective teaching skills and I can share them to help student teachers and that I need to be open to new ways of teaching in order to keep my own teaching fresh. I am happy to attend the group that I can learn from other mentors to share positive though, skills, and ideas on science teaching and mentoring that are valuable resources.”

Some of the reflections on future science mentoring on student teachers followed:

> ”We mentors always do not develop detailed plans. Rather we plan and record activities in a “shorthand fashion”. These planning processes become embedded and the concrete reminders are no longer necessary. To assist novices, especially to those student teachers who do not understand the importance of planning for novices, we might demonstrate how to plan and prepare for the lesson, plan a lesson with mentees together, or review a lesson the beginner has already developed. This interaction processes make we mentors to check the understanding of a lesson and more important give the interns the benefit of seeing an experienced teacher move from plan to implementation. ”

> ”Both mentors and mentees played equally important roles in making mentee's teaching experience productive and meaningful. The challenge for both novice teachers and their mentor was to work as a team, managing differing viewpoints and building on shared perspectives. As mentoring various interns, we confront the values and beliefs of a diverse group of young adults. We know that an effective mentor know that people skills are very important skills in the mentoring process. Next cycle, we need to increase

understanding and mutual respect and acknowledge the needs and feelings of mentees. ”

”For making a more effective mentoring program, we need a framework to restructure our science mentoring for student teacher. Without a framework of professional practice in hand, both mentors and mentees cannot have a common ground and a common language for setting goals and objectives to improve performance. ”

Conclusion

In summary, we were pleased with the general and specific strategies and techniques that were established to maintain a more positive mentoring experience for both the mentor and the mentee. The collaborative action research on mentoring helped mentors to be prepared to assist their mentees in a more positive way. The effective internship gave mentees a more realistic view of the science curriculum and more important that their students were the real beneficiaries.

School accepting student interns might consider creating support groups of mentors. The support group of mentors become part of a induction team to guide interns into the profession. The purpose of these groups is to discover, discuss, refine, and formalize their growing knowledge about mentoring practices. School administration could then use this information to design staff development opportunities for both novices and mentors.

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