

## Implementing Professional Experiences to Prepare Preservice Science Teachers

Prasart Nuangchalem

Department of Curriculum and Instruction, Faculty of Education,  
Mahasarakham University, Mahasarakham 44000, Thailand

---

**Abstract:** In the correlation between professional experiences of preservice science teacher and classroom managerial skills, professional experiences were designed to prepare science teacher in the future. The effects of program were described the result of implementing professional experiences of 67 preservice science teachers. Data were collected by using a set of questionnaire and post professional experiences seminar. The results showed that most of preservice teachers had gained more professional experiences, adapted instructional theory into practice and learn how teach science. They need to prepare themselves in terms of pedagogical understandings and learn how to be a good teacher. Pre professional experiences seminar, workshop for learning innovation, classroom management, best practice for science teaching and instructional media development were required.

**Key words:** Professional experiences, preservice science teacher, seminar, managerial skills, preservice teacher, opportunities

---

### INTRODUCTION

Teacher development acts as a major role in the way of growing up quality of education. The professional experiences, arguably the most powerful influence in preservice teacher education (Bullough *et al.*, 2002). Teacher preparation has been continually searching for the best possible ways of preparing teachers to be most effective in their classroom delivery. It is increasingly being urged to focus on developing in future teachers. The concept of professional experiences recognizes preservice teachers as key elements in their own professional growth, knowledge constructors and agents of change in science learning (Cochran-Smith, 1991; Cochran-Smith and Lytle, 1999; Darling-Hammond, 1994).

In the current instructional culture, questions are posed regarding the content of teacher education program, concerning vision, knowledge and necessary skills required and expected new teachers (Pultorak, 1996). The framework for preservice teacher reflection based on cognitive apprenticeship, interpersonal skills, collaborative problem-solving, coaching and supervision, which served as a beginning for professional experiences (Campbell-Evans and Maloney, 1997; Mitchell, 1996). Real school situations where empowering preservice teachers have proven successful and provide a basis for further guidance. Teaching is perhaps only activity where preservice teachers bring with them a history of observed practice. We believe, if change is truly important for the growth of education. They must be given the skills and knowledge to develop a pedagogical content knowledge, to critique practice and challenge traditional pedagogy.

The Faculty of Education, Mahasarakham University has been established for 40 years, responsible for education development, produce teachers and person relevant to educational services. Preservice teacher development encourages and supports the reflective practice in school science. It is partially teacher development program, needs to have fulfillment in content, responsibility, moral, ethics and skills. Such a conceptualization is in direct contrast with more traditional views of learning to teach (Britzman, 2003). The study aims to explore the reflection on professional experiences of preservice science teachers. The result of study can help educators prepare the professional experience environments, allows them learn how to be a good teacher, reflect needs of learning support in school science and some criteria for teacher preparation.

### MATERIALS AND METHODS

In the second semester, 2006 academic year, 67 preservice science teachers registered course 0506336 Curriculum and Instruction in Science. A part of this course was standard form of the professional experiences offered at the university and involved student teaching for 8 weeks in collaborated school. The phenomenological case study design was preferred for this study. It emphasizes on inductive of data as well as subjects' perspectives and the meanings that preservice science teachers construct of their own professional experiences. Qualitative data were collected by questionnaire listed on the opinions and needs of professional experiences. Also, the post professional experiences seminar, peer sharing

and classroom discussion were examined. Data were compiled in separate folders for each participant. It was used to conceptualize the data. Some of each case were developed after reading and rereading the data.

## RESULTS

Preservice science teachers reflect their own experiences in terms of school science attraction. Teaching reflection can be described that professional experiences as a first chance transferred pedagogical theory into practice. Most of preservice science teacher had anxiety with school practicum, aware of role model and supervisor and response expected behavior in school hours. Such instructional environment needs learning objectives, pedagogical methods, learning activities, instructional media and assessment. They had learned how to prepare learning scientific concept in a different environmental contexts, incorporate indigenous science to school science, act as role model, write scientific inquiries lesson plan and search for effective instructional media.

Most of them feel that teaching preparation is very important and it can be understandable. The concept of scientific inquiries, backward design and student-centered approach are adopted into science classroom with standard-based curriculum. Thus, they know and understand the entire concept that can help them to consider. Although, instructional preparation needs more inquires, learn to be a master teacher is not easy to do than those they think. However, several students acknowledge difficulty in giving an opinion about professional experience issues due to lack of information and some actually experiences for the school science.

I need more information relevant to pedagogical knowledge, instructional preparation and more direct experiences in school hours. Also, I need to share my opinion about teaching practicum in both the same and different field of teaching.

Before intern, I think, I need to prepare myself in terms of teaching paradigm for teacher i.e., pedagogical knowledge, school-based curriculum, science curriculum, educational assessment, educational innovation, learning media development, classroom psychology. Hence, teaching will be effective, preservice teacher might want to have knowledge and understanding in such professional teachers done.

Preservice science teacher had raised the issue on learning activities. The 5e instructional model can be

generalized in science classroom. They had no skills to enough in science teaching, student cannot be engaged, but questioning method is fruitful for classroom. Also, demonstration method is more effective in case of poor school. They will use peer discuss, write something on the blackboard and explore school environment.

In case of lesson plan preparation, I need to learn more and decide to attend in inquiry-based teaching. 5Es inquiry lesson plan is need, but it not enough.

Supervisor can help them learn how to manipulate classroom which can allow science into classroom. Preservice science teacher need supervisor, who believe in their own ideas and competency, occasionally observed in some cases, propagate inquiry science. School should be purposive selecting supervisor who is the best practice, ready to advice, act as an expected role model and decide to do some things based on scientific habit. Some preservice teachers raised their opinions on supervisor in school that they have professional experienced as follow:

Supervisor, is a mentor, should have too much experiences in teaching profession. He/she enables preservice teacher to gain more knowledge and experiences in both academic and professional applications. Also, he/she can clarify lesson plan and classroom management to preservice teacher in appropriately.

Supervisor should act his/her roles with preservice teacher as colleague, provides some recommendations that is to lead me in terms of a good teacher and best teaching classroom. Teacher values and attitude towards teaching profession should be fulfilled as much as supervisor can do. In my wish, I would like to have master science teacher or national science teacher becomes a role model for supervision.

The criteria based on preservice science teachers' need on professional experiences are relevant to possibility that school and university should be considered. The preservice science teachers' need on professional experiences raised many criteria for preparing one year experiences in school. The needs of preservice science teacher on professional experiences were summarized.

Faculty of education and collaborated school should be having more cooperation during the professional experiences. The school and university collaboration should be raised competency in terms of learning together. Information about professional experiences plan

and school details should be prepared before practicum. Also, university instructor should have schedule for proposing lesson plan, it will allow time to prepare and consider the effective scientific thinking as shown in lesson plan.

The faculty of education should provide them all about pedagogical technique and science learning media development. It is very important knowledge that they have to use for non-science school, which located in rural and insufficient materials to teach science. Supervisor can advise preservice teacher as relevant to field of their studies, high teaching skills, best practice of science teacher and act as mentor friendly. Supervisor should believe in their abilities, allow them learn with maximize competency.

Preservice science teachers need to gain more knowledge and understanding in terms of incorporating indigenous science into classroom, diverse activities in science classroom, socio-scientific issues and challenges students' idea about science. Also, students should have been learning based on integrated science learning, ethics and moral in science and student-centered approach. They also need promoting of self-confidence, knowledge and understanding in various field of study should be made and information technology in terms of educational technology are purposed. They need to have professional experiences in school at ready, safety, close to home town and flexible schedule for supervision.

In sum, student teachers need pre professional experiences seminar for discussion in the appropriate way to do together among faculty of education, school policy and preservice teacher roles. To fulfillment in teaching knowledge and experiences, preservice science teachers eager to learn. Best practice in instructional approaches and dramatically teaching are required. However, they try to be a master teacher by learning inquiry. They made worksheet, mind mapping, photograph, picture and etc. to help student scientific concepts. Moreover, preservice science teacher found that most of in-service teacher abandoned the importance of media. Lecture method is familiar and frequently used in science classroom. Experimentation is a little component of instruction, student is not challenged and science classroom did not allow inquiry.

## **DISCUSSION**

Teacher development can be adopted in the current study, professional experiences in school should be done and teacher students will be learned how pedagogical understanding. Preservice science teacher, a school apprentice, will change their paradigm in workplace based

on real situation. They can learn instructional innovation by adopting educational theory into practice (Good, 1973). Inquiry science is engaged (Lotter, 2004; Mule, 2006), decision making in science classroom is made in appropriate ways (Kosnik, 2001), preservice science teacher to be empowered as reflective practitioners while on practical teaching experiences (Ussher, 2001).

The professional experiences needs to be developmental in approach, achieve on the learned skills, knowledge and attitudes towards science. The faculty of education should be aiming to develop student's responsibility for their own professional development. The extension of the goals into teaching practicum experiences will be of benefit to students they teach in the future. Also, inquiry-based teaching argues the need to professional experiences (Darling-Hammond, 1994).

In an inquiry-based practicum the mentor teacher and preservice science teacher relationship may change to diminish the power differences (Poetter *et al.*, 2000). They understood reflecting on self, instructional strategies, children learning, as well as the curriculum to be an important tool for professional development (Burbank and Kauchak, 2003). Preservice science teachers reflect the critical interest in their inquiry it is not always clear if social-reconstructionist based teacher education (Liston and Zeichner, 1991). Present study suggests that a practicum founded on university-school collaboration can be beneficial to preservice teachers (Graue and Brown, 2003).

The studies led to initial observations that preservice science teacher have to practicum in one year school science in next semester. Pres-service science teachers perceptions of inquiry it seems to them that learning to teach (Britzman, 2003). Also, faculty of education should increase collaboration between mentors and preservice teacher, lead student teacher into deeper levels.

Reflection, they will reveal a preoccupation with mainly the problematic and personal interest areas. They are concern in scientific mind and inquiry-based approach about learning to teach. The learning environment emphasize on collaboration with others in the practicum (Beach and Pearson, 1998; Burbank and Kauchak, 2003).

The coaching and supervision phase gives positive encouragement to the idea of reflective practice during teaching practice. It may be difficult to distinguish between the ideas and practice of the associate teacher and the evaluative visitor in this section. Preservice science teacher should be fulfilled their own responsibility and ability to teach science. However, some of them give us an idea that student-centered approach is very difficult to transfer. Nature of science and inquiry teaching should be introduced for preservice science teacher

(Chalie's *et al.*, 2004), it will assist them meet goal the pedagogical content knowledge (Loughran and Berry, 2005) and lead construction body of scientific knowledge into classroom (Fairbanks *et al.*, 2000; Sandford and Hopper, 2000). The professional experiences reflect practice through mentor and supervision, school discussion based on problem-solving in different contexts can promote interpersonal quotient (Pence and Macgillivray, 2008). The pre professional experiences seminar should be considered before sending preservice into school science.

### CONCLUSION

The study pointed that faculty of education should structure teacher development based on possibility and suggestion of preservice science teacher. Facilities of school practicum and others related professional experiences i.e., school collaboration, pedagogical development information, university newsletter and etc. Also, mentor and student teachers need to have meeting and work task decision. School allows best practice in science teaching as a mentor. Preservice teacher should have more opportunities to reflect their own ideas in science classroom as much as they create.

### REFERENCES

- Beach, R. and D. Pearson, 1998. Changes in preservice teachers' perceptions of conflicts and tension. *Teaching and Teacher Educ.*, 14 (3): 337-351.
- Britzman, D.P., 2003. *Practice Makes Practice: A Critical Study of Learning to Teach*. Albany, State University of Press, New York.
- Bullough, R.V. Jr., J. Young, L. Erickson, J.R. Birrell, D.C. Clark and M.W. Egan, 2002. Rethinking field experiences: Partnership teaching versus single-placement teaching. *J. Teacher Educ.*, 53 (1): 68-80.
- Burbank, M.D. and D. Kauchak, 2003. An alternative model for professional development: Investigations into effective collaboration. *Teaching and Teacher Educ.*, 19 (5): 499-514.
- Campbell-Evans, G. and C. Maloney, 1997. An alternative practicum curriculum: Exploring roles and relationships. *Asia-Pacific J. Teacher Educ.*, 25 (1): 35-52.
- Chalie's, S., L. Ria, S. Bertone, J. Trohel and M. Durand, 2004. Interactions between preservice and cooperating teachers and knowledge construction during post-lesson interviews. *Teaching and Teacher Educ.*, 20: 765-781.
- Cochran-Smith, M., 1991. Reinventing student teaching. *J. Teacher Educ.*, 42 (2): 104-118.
- Cochran-Smith, M. and S.L. Lytle, 1999. The teacher research movement: A decade later. *Educ. Res.*, 28 (7): 15-25.
- Darling-Hammond, L., 1994. *Professional Development Schools: Schools for Developing a Profession*. Teachers College Press, New York.
- Fairbanks, C.M., D. Freedman and C. Kahn, 2000. The role of effective mentors in learning to teach. *J. Teacher Educ.*, 51: 102-112.
- Good, C.V., 1973. *Dictionary of Education*. 3rd Edn. McGraw-Hill, New York.
- Graue, E. and C.P. Brown, 2003. Preservice teachers' notions of families and schooling. *Teaching and Teacher Educ.*, 19: 719-735.
- Kosnik, C., 2001. The effects of an inquiry-oriented teacher education program on a faculty member: Some critical incidents and my journey. *Reflective Practice*, 2 (1): 65-80.
- Liston, D. and K. Zeichner, 1991. *Teacher Education and the Social Conditions of Schooling*. Routledge, New York.
- Lotter, C., 2004. Preservice science teachers' concerns through classroom observations and student teaching: Special focus on inquiry teaching. *Sci. Educator*, 13 (1): 29-38.
- Loughran, J. and A. Berry, 2005. Modelling by teacher educators. *Teaching and Teacher Educ.*, 21: 193-203.
- Mitchell, J., 1996. Developing reflective teaching: Negotiation in the practicum. *Asia-Pacific J. Teacher Educ.*, 24 (1): 47-61.
- Mule, L., 2006. Preservice teachers' inquiry in a professional development school context: Implications for the practicum. *Teaching and Teacher Educ.*, 22: 205-218.
- Pence, H.M. and I.K. Macgillivray, 2008. The impact of an international field experience on preservice teachers. *Teaching and Teacher Educ.*, 24: 14-25.
- Poetter, T., B. Badiali and D.J. Hammond, 2000. Growing teacher inquiry: Collaboration in a partner school. *Peabody J. Educ.*, 75 (3): 161-175.
- Pultorak, E., 1996. Following the developmental process of reflection in novice teachers: Three years of investigation. *J. Teacher Educ.*, 44 (4): 288-295.
- Sandford, S. and T. Hopper, 2000. Mentoring, not monitoring: Mediating a whole-school model in supervising preservice teachers. *The Alberta J. Educ. Res.*, 46: 149-166.
- Ussher, B., 2001. Reflective practice: Evaluative lecturers empowering students during teaching practicum interviews. *ATEA Conference-Teacher Education: Change of Heart, Mind and Action*, Melbourne, Sept. 24-26, pp: 1-11.