Thai Student Teachers' Beliefs about Science Teaching and Learning

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The Asian Conference on Education & International Development 2016
Official Conference Proceedings

Abstract

Teacher's beliefs have played an important factor which influence how science teachers teach. This study intended to explore the student teachers' beliefs on science teaching and learning in a teacher preparation institution in Southern Thailand. The study was conducted during their field experience in the second semester of, academic year 2014. Common aspects of teaching and learning, teacher roles, and teaching strategies were taken into account to reveal teachers' beliefs. Semi-structured interviews were used to explore the beliefs about science teaching and learning by using Teacher Belief Interview (TBI) (translated version). The respondents of the study were 18 Thai student teachers that were selected by using purposive sampling technique. Categories present within each question were identified. Categories that emerged from the transcription of the interviews resulted from the constant comparative method. Teacher-centered responses were identified as "traditional" or "instructive" beliefs. "Responsive" and "reform-based" answers were identified as student-centered beliefs. The findings indicated that their beliefs about teaching and learning distributed evenly between teacher-centered and student-centered responses.

Keywords: Thai student teacher, beliefs, science teaching, learning

Introduction

Teaching and learning management of teachers is the key to improving the quality of students. Effective and successful teaching, teachers must have the necessary knowledge and can put the knowledge to use appropriate teaching in the classroom. In addition, the teacher used teaching process based on the concept that they held. These are causing the teacher expresses the teaching behavior and determine the direction instruction of teachers.

Teachers' beliefs represent individual teacher's ideas about what they think is true and reflect their own prior experiences with science. Undeniably, teachers' beliefs about teaching and learning play an important role in affecting the nature of teachers` intentions in the classroom and in influencing their professional work, like lesson planning, assessment, and evaluation. These beliefs have an impact on teachers' decision making during classroom interaction with students (Nespor, 1987; Pajares, 1992)

Over the years, researchers have paid more attention to the area of teacher practices, attitudes, and knowledge. The concern about how little we know about how teacher beliefs about science teaching and learning, and how they relate to teacher practices have been recently elevated in learning about the development of science teachers. A recommendation for future research includes the area of science teacher preparation programs with a focus on their beliefs related to their teaching and practices (Fullan, 2001).

The ultimate goal is to improve the quality of teacher preparation programs by better understanding the role the beliefs of teachers and their crucial components in the pre-service development of science teachers. Therefore, the focus of the research is to examine Thai Student Teachers' beliefs about science teaching and learning.

Literature review

Beliefs have been receiving a great deal of attention from educational researchers and widely discussed in the literature. Bandura (1986) stated that beliefs are considered to be the best indicators of why a person behaves, handles information, and makes decisions in a certain way. In educational research, beliefs about teaching and learning are categorized into two dimensions-Traditional and Modern. These two belief dimensions are variously termed as direct vs. indirect; conventional vs. contemporary; teacher-centered vs. student-centered approach of teaching-learning process. (OECD, 2009; Wolley *et al*., 2004).

Objective

This research intended to explore the student teachers' beliefs on science teaching and learning in a teacher preparation institution in Southern Thailand.

Methodology

Research design

An interpretative research was chosen. Researcher collected and interpreted qualitative data about student teachers' beliefs on science teaching and learning. It focused on the in-depth meanings that participants ascribed to the emphasized on nature of teaching and learning aspects.

Participants

There were 18 student teachers who participated in the research during their field experience in the second semester of, academic year 2014 were selected by using purposive sampling technique. They were student in a teacher preparation institution in Southern Thailand. All of them was female. They had previous training experiences that they had enrolled in professional subjects with specification in Science (Biology, Chemistry, Physics, Geology, and etc.)

Method/Research instrument

In this research, the instrument was a translated version (in Thai) of Teacher Belief Interview (TBI), originally designed by Luft and Roehrig (2007). It was used to explore the beliefs about science teaching and learning. The TBI utilizes semi-structured interview questions to elicit the beliefs of each participant, allowing the interviewer to probe the thoughts of the teacher in order to understand his/her beliefs. Teacher Belief Interview (TBI) comprises of the following questionnaire items (see table 1).

Table 1. Questions used for teacher beliefs interview (TBI)

Teachers' beliefs about teaching and learning
1. How do you maximize student learning in your classroom?
2. How do you describe your role as a teacher?
3. How do you know when your students understand a concept?
4. How will you decide what to teach or what not to teach?
5. How will you decide when to move on to a new topic in your class?
6. How do you think students learn best?
7. How will you know when learning is occurring in your classroom?

Source: Luft and Roehrig (2007)

Data collection

Researcher used Teacher Belief Interview (TBI) (translated version) to interview student teachers' beliefs on science teaching and learning. The data was collected during their field experience in the second semester of, academic year 2014. Each interview followed the semi structured interview protocol which was open ended in nature. Each interview was audio taped using a digital voice recorder. Field notes were also compiled during the interview.

Data analysis

The researchers analyzed data by from the transcription of voice recorder interviews of each student teacher. In data analysis, the researcher used data classification; it is called micro typological analysis which analysis phrases or sentences then grouped of words or coding keywords that were shown in teachers' beliefs about teaching and learning. After that, the summaries were searched for pattern and/or categories. The emergent categories used for the questions were Traditional, Instructive, Transitional, Responsive, and Reform-based. The researcher checked the consistency by data triangulation, then interpretation and conclusion by analytic induction.

Results and discussion

This part describes how the beliefs about teaching and learning. Table 2 shows the results of the survey of student teachers' beliefs on science teaching and learning.

Table 2 The frequency of Thai Student Teachers ' beliefs about science teaching and learning.

(N=18)

Teachers' beliefs about teaching and learning	**Teacher-centered beliefs**		**Transitional**	**Student-centered beliefs**	
	Traditional	**Instructive**		**Responsive**	**Reform-based**
Beliefs about Teaching					
How do you maximize student learning in your classroom?	2	3	6	7	
How do you describe your role as a teacher?	2	6	7	3	
How will you decide what to teach or what not to teach?	1	7	7	2	1

Table 2 (Continued)

(N=18)

Teachers' beliefs about teaching and learning	Teacher-centered beliefs		Transitional	Student-centered beliefs	
	Traditional	Instructive		Responsive	Reform-based
How will you decide when to move on to a new topic in your class?	2	7	5	3	1
Total	7	***23***	***25***	***15***	2
Beliefs about Learning					
How do you know when your students understand a concept?	1	2	11	3	1
How do you think students learn best?		4	9	4	1
How will you know when learning is occurring in your classroom?		1	10	6	1
Total	1	7	***30***	***13***	3

The eighteen participants for this study were selected**.** In Table 2 the Teacher Belief Interview (TBI) seven central questions are displayed based on whether they held beliefs about teaching or beliefs about learning. The individual questions were coded along the Teacher-centered to Student-centered continuum which includes the categories of: Traditional, Instructional, Transitional, Responsive and Reform-based. This study identified several frames of reference to conceptualize the complex interplay between beliefs on science teaching and learning.

Beliefs about teaching

Total of the study indicated that their *beliefs about teaching* were between teacher-centered and student-centered beliefs. The transitional category was the most frequently scored category. For example, when the interviewer asked, how do you describe your role as teacher? They responded,

"I am responsible for guiding students in their development of understanding and process skills."

Transitional category belief about teaching reflected that the main focus was on the teacher's relationship with students. A Transitional teacher organized the classroom around students' needs by providing students science activities. In the transitional classroom, teacher involved with designing activities that builds a positive supportive environment.

Beliefs about learning

Participant *beliefs about teaching and learning* are summarized (Table 2). Their *beliefs about learning* are more transitional to responsive than his *beliefs about teaching*. For example, how do you know when your students understand a concept? They responded,

"Students can apply what they've learned."

This was an example of a reform-based response because the application of concepts to new situations to demonstrate scientific understandings.

There might be a few explications why the beliefs about learning are a little more student-centered than their own beliefs about teaching. This might present that the *beliefs about teaching* are more grounded to their own prior experiences, while the *beliefs about learning* are more grounded in the coursework of a teacher preparation institution.

Conclusion and Recommendations

The present study indicated that their *beliefs about teaching* were between the categories teacher-centered beliefs and student-centered beliefs. Their *beliefs about learning* were more transitional to responsive than his *beliefs about teaching*.

A teacher preparation institution and university science teacher education should dedicate continuous efforts to change student teachers' beliefs about teaching and learning by mostly model constructivist teaching approaches.

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