

International Conference on Education

Conference Theme: Teacher Education

**Constructing Academic Success by Developing the Attitudes, Perceptions,  
and Philosophies of Pre-service Educators Prepared in a Constructivist  
Methodology.**

Dr. James E. Hollenbeck, Ph.D.

Secondary Science Education Coordinator

Indiana University Southeast

[jehollen@ius.edu](mailto:jehollen@ius.edu)

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Abstract

This is a continued study of the attitudes, perceptions, and philosophies of secondary education science teachers pre-serviced in constructivist teaching methodology over their first five-years of teaching.

The following trends came out on reviewing all of the data concerning the attitudes; perceptions and philosophies of five teachers in were prepared as constructivist teachers. In the first year of teaching only three teachers taught as constructivist teachers. In the third year of teaching, the classroom practices of the teachers converged more closely to their beliefs and pre-service preparation in constructivism. In the fifth year of the study all teachers were ranked in the constructivist teaching methodology and expressed that they were very comfortable in the classroom.

Important factors identified by the teachers as condition to their continued success in the classroom are maturation, experience, and acceptance in the school and community.

## I. Why a Study on Pre-Service Programs?

Several major reports (e.g., Hunt, 1996; Commission; 1996) address serious concerns about the effectiveness of teacher preparation programs. Science teacher preparation programs in particular have come under attack for producing graduates ill prepared to teach K-12 science in the United States. The findings from this study suggest that the efforts and time provided to fostering conceptions about teaching and learning can lead to highly positive outcomes. Teachers entering schools with progressive views on teaching and learning, i.e. e., views aligned with the National Science Education Standards (National Research Council, 1996) will establish a classroom environment where personal relevance of the subject as perceived by the students becomes a focus. A student-centered learning environment becomes a place where students have the opportunity for meaningful learning to occur.

Strike and Posner (1982) pointed out changes in beliefs may result when enter the classroom ready to challenge traditional held paradigms and allow for student inquiry and questioning. Teachers must allow students to construct and assimilate new information so they can understand the nature of science.

Thus the pre-service teachers must be engaged extensively in dialogue and argument, both oral and written, in order to articulate and thereby refine their implicit beliefs about intelligence, knowledge, teaching, and learning, and to reach consensus on appropriate professional research-based practices of teaching and learning. The benefits of a successful pre-service program provide the teacher with learning. The benefits of a successful pre-service program

provide the teacher with the opportunity to self-reflect on teaching experiences in order to articulate their experiences and attempt changes (Hashweh, 1996; Copeland et. at. 1993).

A pre-service science education program must have a significant emphasis on the nature of science. Unless teacher education programs are designed with the qualities that ensure new teachers to enter the classroom prepared with the skills and understandings needed for success, pre-service education programs will continue to be susceptible to the criticism that they are ineffective and should be reduced, if not eliminated all together. However, properly conducted teacher education programs utilizing the national education standards can effect meaningful changes in:

- Teachers' understanding of teaching, learning, content, and assessment,
- The way science is taught, and
- The classroom-learning environment.

Given the traditional indoctrination into the educational system that most teachers have experienced since grade school, teachers must struggle to reach beyond what they have come to know about teaching and learning. They must either replace or support their beliefs about effective approaches toward science education with research-based convictions. Von Glaserfeld (1992) asserts, "We have no reason whatsoever to change what we are doing as long as it produces the desired result". The findings of the present study provide evidence to support the conceptual change approach to teacher preparation by

using constructivist methodology in the classroom as described by Penick and Yager (1988).

## II. Summary/ and Implications of the Study

The present study was designed to obtain and understand how beliefs in terms of teaching, learning, science, and school held by science teachers' change in their first five years of teaching after graduation from the University of Iowa. Next, it was meant to find the relation between those beliefs and the learning environment the teachers establish in the classroom, and the way it is perceived by their students.

The teachers' beliefs were first qualitatively analyzed and then ranked relative to views endorsed by the National Science Education Standards of teaching, learning, and professional development. The ranked data were then compared to test trends.

The significant results reported in this study include the following:

- All teachers in the study cite that the training they received in their pre-service program at the University of Iowa was instrumental in helping them to establish their teaching methods. The pre-service program at the University of Iowa is based on and validated by the NSES.
- Even though the teachers studied all attended the same science teaching pre-service program, variety exists in the degree to which they establish a constructivist-teaching environment, as their students and the researcher perceive it.

- If the goal of a science teacher preparation program is to produce teachers that will establish a constructivist learning environment in the classroom, then a concept-based approach must be taught at the pre-service level that challenges prevailing teacher belief systems relative to teaching and learning.

### III. Limitations of the Research

The conclusions of this research regarding links between teacher beliefs relevant to teaching, learning, science, school, and student perceptions of the classroom rest largely on the degree to which the teacher beliefs are accurately questioned and evaluated.

In combining qualitative and quantitative analyses insights into beliefs held by the interviewed science teachers regarding teaching, learning, science, and school and the relationships among those beliefs and the classroom learning environment as perceived by their students have been gained over the five years of experience. Even though the five teachers held many different beliefs, a significant positive correlation did exist between beliefs in terms of teaching, learning, and specific features of the learning environment. These findings suggest that the more aligned a teacher's beliefs in terms of teaching and learning are to those espoused in the National Science Education Standards, the more likely the teacher is to establish a positive and success driven learning environment in which students perceive a constructivist classroom. Which are dependent on the teachers identified factors: as maturation, experience, and acceptance in the school and community.

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