



Research Paper

Elementary teachers' perception on the implementation of the goals of science and technology domain and science learning area

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Abstract

Aim: The present research aimed to investigate how teachers perceive the implementation of the goals of the science and technology education domain and science learning areas in elementary schools. This research is a qualitative research in terms of the type of data and applied research in terms of purpose. Among the various methods of qualitative research, phenomenological research method was used. Data collection tools were open questionnaires, diaries, semi-structured interviews and field, and reflective notes. The data analysis method was deductive and considering the three categories of self, task, and impact, which reflects the stages of teachers' concern in implementing change/innovation. The findings showed that the most important self-concerns expressed by teachers were related to the deep understanding of the documents related to the Fundamental Educational Reform; the imitative practices in the implementation of these documents, and the interference of different projects and the pressure of their implementation on school staff. Regarding task concerns, the majority of participants mentioned the lack of

time and a context supportive of change to facilitate implementation. Impact concerned teachers were concerned about the impact of the change on student's learning. This research depicted that the majority of the participants called for providing them with a deep understanding of the documents related to the Fundamental Educational Reform. The implementation of the Fundamental Educational Reform documents is facilitated when teachers and other agents have a clear vision of the change at school levels.

Keywords: Elementary Teachers, Science and Technology Domain, Phenomenology

Introduction

The present research aimed to investigate how teachers perceive the implementation of the goals of the science and technology education domain and science learning areas in elementary schools. According to Hall and Hord (2015), teachers go through the stages of concerns when they face educational changes or innovations. Concerns are interpreted as teachers' feelings about, perceptions of, attitudes toward or reactions to a specific educational change or innovation. These concerns can be a very positive force for change and determine the type of help teachers need. Hall and Hord (2015) introduced Stages of Concern (SoC), namely, Self, Task, and Impact concerns in teachers. Self-concerns arise when an individual shows a general awareness of innovation and an interest in learning more. At this stage, they are not sure about the needs of innovation, their ability to meet these needs, and their role in innovation. They are selflessly interested in main parts of the innovation, including general attributes, effects, and usage requirements. Task concerns arise when the individual is worried about the task itself rather than their ability. Individuals at this stage focus on the "how-to-do-its" and on the process and the tasks involved for the innovation. They are eager to know the best way to use the resources and information to implement the innovation. Issues related to efficiency, organization, management, scheduling, and time requirements are extremely important. Individuals with impact concerns can see the impact the change is going to have on student's learning. They work with others and discuss their ideas about the use of the innovation. They explore the more general benefits of the innovation, including the possibility of major changes or other powerful alternatives. These individuals are positive and enthusiastic. They talk to one another about the strengths and successes they are experiencing in using the innovation and come up with specific ideas about innovative alternatives. In Iran, the Fundamental Educational Reform documents were approved in 2011 and they were followed with approval of curriculum goals for different levels of education. This means teachers are faced with extensive changes in the implementation of the intended curriculum, which affects their

performance in various aspects. Considering these changes is essential for the implementation of intended curriculum goals. Therefore, the aim of this research was to investigate how teachers perceive the implementation of the goals of the science and technology education in the science learning areas in elementary schools.

Methodology

This applied qualitative research used phenomenological approach to examine human experiences regarding the study subject. The participants were teachers and staff in 19 districts of Tehran who were selected purposefully. According to Patton (1980), purposeful sampling is used when the researcher does not seek to generalize the findings and intends to achieve an in-depth understanding of a phenomenon. Data were collected using open-ended questions, semi-structured interviews, field notes, and reflective notes. Using multiple methods increases the validity and reliability of the research and creates a more in-depth picture of the phenomenon of interest (Creswell, 2013; Denzin and Lincoln, 2005). To analyze the data, interview transcripts, field and reflective notes were read several times, keeping in mind both the literature reviewed and the research question. After getting a sense of the participants' perceptions, the researchers segmented the relevant parts of the data for coding (Creswell, 2013). Codes were identified and highlighted. The codes and their definition were recorded in the code book to ensure consistency between researchers. When no more issues emerged from the data, code development stopped. The codes were compared and those with similar attributes were categorized (Hennink, Hutter, & Bailey; 2010) into apriori themes (Gibson & Brown, 2009). These themes were the SoC introduced by Hall and Hord (2015). To increase the trustworthiness of the research, the process of placing data into themes was regularly discussed with research participants and reviewed based on the feedback received.

Results

The findings showed that the most important self-concerns expressed by teachers were related to the deep understanding of the documents related to the Fundamental Educational Reform; the imitative practices in the implementation of these documents, and the interference of different projects and the pressure of their implementation on school staff. At this stage, the participants were concerned about the dominance of the textbook instead of the curriculum design as it restricted teachers' decision-making during teaching-learning process. Most participants were concerned with the

stereotyped beliefs in teaching. Regarding task concerns, the majority of participants mentioned the lack of time and a context supportive of change to facilitate implementation. The findings showed that professional interactions and networking with peer teachers were necessary to facilitate changes. The key characteristics of the teachers needed to facilitate implementation were having lifelong learning skills, valuing research in their role as teachers, showing foresight, creativity and innovation, flexibility, as well as interest in students. Impact concerned teachers were concerned about the impact of the change on student's learning. They mentioned that students' first-hand experiences and their freedom of action increased their interest in learning. Despite the positive attitude toward this change, some of them believed that existing uniform assessment methods were a barrier to facilitating implementation. They were pleased that this innovation facilitated individualized learning. Teachers' participation in the change process provided an opportunity for them to reflect on their professional competencies as an active agent, and to go beyond their students' learning and think about their own and their colleagues' learning. They saw the existing centralized systems of formal education as a serious barrier to playing this role. They believed that construction of a professional learning community in which learning occurs increases the success of implementing changes.

Discussion and conclusion

This research depicted that the majority of the participants called for providing them with a deep understanding of the documents related to the Fundamental Educational Reform. They considered the existing practices to implement these documents as imitative practices. Therefore, to implement changes, first of all, teachers' participation and acceptance of the change must be ensured. These finding are consistent with previous research finding (Mellado, 2006). The implementation of the Fundamental Educational Reform documents is facilitated when teachers and other agents have a clear vision of the change at school levels.

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