

Relations Between Teachers' Epistemological Beliefs and Teaching Practice in Serbia

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Abstract

Theoretical framework within which this paper is set is the conception of teachers' epistemological beliefs. The author's attention is focused on the classification of teachers' beliefs in the realistic, contextual and relativistic approach. The question that permeates this study is whether the teacher's beliefs are consistent with their work in practice. A questionnaire was made for the purpose of the research and the sample encompasses 420 teachers in Serbia. Results show that the subjects mostly estimate that they belong to a constructivist profile. However, their answers indicate that their acting is different from their self-assessment. Research findings imply a need for an awakening of teachers with regards to personal epistemologies.

Keywords: *constructivism, teachers' epistemological beliefs, teachers' professional development, teaching practice.*

Introduction

During the last few decades there has been an increase in research on teachers' epistemological beliefs (Hashweh, 1996; Hofer, 2004, 2010; Pajares, 1992; Schommer, 1994; Schraw & Olafson, 2003; Schraw, Olafson & Vander Veldt, 2011). The significant fact is that teachers' epistemological beliefs are linked to teachers' beliefs on the nature of learning and teaching, students' understanding or knowledge, as with their approach to teaching in specific contexts (Brownlee, Boulton-Lewis &

Purdie, 2002; Hofer & Pintrich, 1997). Epistemological changes and their articulations are conditioned by the following dimensions: certainty of knowledge, simplicity of knowledge, source of knowledge and justification of knowing (Hofer, 2004). In that context, the wider theoretical framework within which this study is set represents conceptions of epistemological beliefs of teachers developed during the last few decades – determining of epistemological beliefs (Hofer, 2004) and conceptualization of three epistemological world views (Schraw & Olafson, 2003). Concurrently, the theoretical framework of the paper is also represented by the directions of the education system reform presented in the strategic document on education development in Serbia – *Strategy of education development in Serbia by the year 2020* (2012) – which states that in our schools modern forms of practice are scarce and the lecture method is dominant; active learning, research methods, individual learning and other approaches and practices focused on the student are seldom used.

Research Problem and Research Focus

While epistemology represents primarily a philosophical construct, personal epistemologies or epistemological beliefs involve the use of this concept at a psychological level and dealing with the question of how individuals see the nature of knowledge and ways of knowledge acquisition, as well as its limitations and justification (Hofer, 2010). Schommer (1994) criticizes the one-dimensional understanding of epistemological beliefs. Schommer sees these beliefs as a group which consists of five dimensions: origin of knowledge, certainty of knowledge, structure of knowledge, knowledge acquisition and speed of knowledge acquisition.

Teachers' epistemological beliefs refer to a set of beliefs or personal theories regarding knowledge and justification of knowledge, whereas ontological beliefs encompass a group of beliefs on the nature of reality and existence (Schraw et al., 2011). Similarly to epistemological beliefs, ontological ones can be silent or explicit, and supposedly change due to knowledge and teaching activities which promote critical awareness of beliefs. Also, it is assumed that these two kinds of beliefs act together and determine views on learning and teaching (Schraw et al., 2011). Schraw and Olafson (2003) define teachers' epistemological world views as clusters of beliefs about knowledge and knowledge acquisition, clusters which influence the ways of thinking and important decision making in the teaching process. The previously mentioned authors conceptualize teachers' three world views: *realistic*, *contextualistic* and *relativistic*. Differences between these three world views are seen in teachers' different attitude towards knowledge. A realist believes that knowledge

is gained from experts, and that learning is a passive act; this approach to teaching closely resembles traditional, transmission model of teaching and learning. A contextualist sees themselves as a participant who constructs knowledge together with students and a relativists assesses students as independent and unique persons, who form their knowledge independently. Although the relativistic approach emphasises the student's personal role in the construction of knowledge, which is prone to change, and the contextualist social processes of knowledge creation and application in the context in which they are attained in everyday life, both approaches are based on constructivist educational philosophy and are significantly more open to inovative forms of teaching (Schraw & Olafson, 2003).

Regarding the area of teachers' epistemological beliefs and their teaching practice, research findings are not single valued. Some studies (Haney, Lumpe, Czerniak & Egan 2002; Hashweh, 1996; Mitchener & Anderson, 1989) show that teachers' beliefs are linked to their practice. Other studies (Abbel & Roth, 1995; Schraw & Olafson, 2003), on the other hand, show that there are no clear or strong connections between teachers' beliefs and their classroom practice. Therefore, some research findings (Kang & Wallace, 2004) indicate that teachers' naive epistemological beliefs are clearly reflected in their practice, while teachers' sophisticated epistemological beliefs are not always clearly linked to their practical work. Research done by Schraw and Olafson (2003) also shows that there is an incongruence between teachers' epistemological world views and their actual work; teachers express the contextualistic world view focused on students but often practice teaching focused on the teachers, so as to fulfill the demands posed by the principles, environment and students. All things considered, this indicates a need for identification of teachers' personal epistemologies; the basic research question that permeates this study is whether the teacher's beliefs are consistent with their work in teaching practice.

Research Methodology

Research General Background

The goal of the research was to investigate teachers' epistemological beliefs and to determine their consistency with concrete work in teaching practice. It was assumed that there are certain inconsistencies between teachers' epistemological beliefs and their work in practice. An independent variable in the research is teachers' profile. This variable is operationally guided through answers to the questions from a questionnaire, which refers to teachers' self-assessment with

regards to epistemological beliefs and teaching approaches – realist, contextualist and relativist. A dependent variable in the research is teachers' concrete work in teaching practice. This variable is operationalized through answers to the questions which are related to teachers' experiences with regards to the nature of knowledge acquired by students in school, practice linked to the assessment of significant outcomes of students' learning, students' role in class, as well as forms of instruction and techniques of students' knowledge assessment.

Research Sample

The research sample is appropriate and encompasses 420 teachers of elementary, secondary and combined schools in south Serbia. Since elementary school is the most massive in the education system, the sample mostly consists of these schools; the sample consists of teachers from eleven elementary schools, nine secondary schools and two combined schools that are meant for both elementary and secondary education. From the total number of the participants, 62.2% are female, 34% are male, while for 3.8% this data is missing. The aspect of feminization of the teaching profession is significant in Serbia, which is confirmed by this data. Based on the teachers' years of experience, the participants were categorized as: teachers with work experience of up to 10 years (37.6%), from 10 to 20 years (30%), from 21 to 30 years (18.8%) and from 31 to 40 years of work experience (11.9%). Also, according to the variable of profession, the teachers were classified into four categories: lower grade teachers, i.e., who teach grades 1st – 4th (31.3%), subject teachers, i.e., who teach grades 5th – 8th of elementary school (30.5%), secondary school teachers (31%) and mixed school teachers (7.2%). One teacher (0.24%), who works in elementary school, did not give this information.

Instrument and Procedures

The research uses data gathered with the use of an instrument created for the purposes of the presented research. The theoretical basis for the construction of the questionnaire is found in the research on teachers' three epistemological world views (Schraw & Olafson, 2003) – realist, contextualist and relativist, since each of them indicates consistency in various domains of pedagogy and represents a relatively unique approach to reality, knowledge and education. The participants were first acquainted with the characteristics of these three world views and then included in profiles depending on their epistemological beliefs and teaching approaches. After this step, the participants in the research were given a possibility to choose one of the three offered answers, which describes different teaching practices which allowed for mapping the teachers' concrete practical work.

Data Analysis

By cross-referencing the teachers' answers to the questions of self-assessment of personal epistemologies and approaches to teaching, data was gathered which relates to the consistency of the teachers' beliefs and their work in teaching practice. Having in mind the nature of the research problem, the used descriptive method, as well as the used techniques and instruments, a quantitative analysis of data was made.

Research Results

The teachers in our research first assessed to which *teacher profile* they mostly belong, depending on their epistemological beliefs and teaching approaches: 1) contextualist, 2) realist and 3) relativist (Table 1).

Table 1. Teachers' profiles in relation to epistemological beliefs and approaches to teaching

Teachers' profile	F	Percentage
Contextualist	201	47.86 %
Realist	101	24.05 %
Relativist	101	24.05%
Σ	403	95.96
No answer	17	4.04
Total	420	100

As answers to the *question regarding the nature of knowledge students acquire at school*, the teachers had the option to choose one of the three offered answers: 1) relatively unvarying and universal knowledge, 2) dependent and varying depending on achievements and newly created changes and 3) subjective and unique for each student, especially prone to change (Table 2).

Table 2. The nature of knowledge acquired by students in school

	Realist	Contextualist	Relativist	Total
Relatively unchangeable	6.1%	5%	7%	5.8%
Dependent and changeable	84.8%	78.5%	65%	76.7%
Subjective and unique	9.1%	16.5%	28%	17.5%

What is noticeable is the fact that in all the three teacher profiles there is a high presence of awareness of the significance of the social context of learning and teaching. The obtained level of significance $\chi^2(4, N= 399) = 13.597, p= .009$, confirms that there are different experiences between realistic, contextualistic and relativistic teacher profiles when it comes to the nature of knowledge acquired by students in school.

When it comes to the *practice linked to the assessment of significant outcomes of students' learning*, the teachers were given the following choices: 1) acquiring sufficient amount of facts and knowledge, 2) understanding and application in a wider context and 3) construction of new knowledge based on obtained data (Table 3).

Table 3. Assessment of significant outcomes of students' learning

	Realist	Contextualist	Relativist	Total
Acquiring	46.43%	23.96%	21.43%	5.8%
Understanding and use	46.43%	54.51%	34.52%	76.7%
Construction of new knowledge	7.14%	21.53%	44.05%	17.5%

The obtained level of significance shows that there is a difference between the realistic, contextualistic and relativistic profiles. The respondents who thought that they belong to a realistic teacher profile put equal value on outcomes characteristic of the realist and contextualist teacher profile. Value of $\chi^2(4, N= 400) = 27.958, p= .000$ confirms that the obtained differences are statistically significant at the level of 0.01.

For the question on *the role which students play in their classes*, the teachers had an option of choosing the following: 1) a role in which students gain knowledge through set standards, 2) a role of an active associate with the teacher and students in the classroom and 3) a role of an active constructor of knowledge independent of the environment (Table 4).

Table 4. The role of students in teaching

	Realist	Contextualist	Relativist	Total
Recipient of knowledge	61%	17.5%	22%	5.8%
Active associate	38%	78.5%	65%	65%
Active constructor	1%	17.5%	13%	5.5%

When compared to the answers to the previous questions in the questionnaire, in which there is slightly more notable inconsistency between teachers' epistemological beliefs and their concrete work, in their answers concerning the roles which students play in their classes the teachers showed that they are mostly consistent with their assessments of personal epistemologies and teaching approaches. The obtained value of χ^2 (4, N= 400) = 76.855, $p = .000$ indicates the existence of statistical importance at the level of 0.01.

The ways in which the teachers *give instructions to students in class* are grouped in the following manner: 1) direct and rigid instructions so students can better understand them, 2) students form instructions in cooperation with the teacher and other students in class and 3) promoting of a personal, experiential understanding in each student individually (Table 5).

Table 5. The forms of instructions in classes

	Realist	Contextualist	Relativist	Total
Direct and firm instructions	76.24%	39.5%	31.68%	46.8%
Cooperation with other students	14.85%	40%	28.71%	30.8%
Personal understanding	8.91%	20.5%	39.6%	22.4%

The obtained results show that when it comes to the forms of instruction in class, there is a certain degree of incongruence between the teachers' beliefs and practice. Statistical significance at the level of χ^2 (4, N = 402) = 61.772, $p = .000$ confirms that between the participants there are differences regarding practice connected to the forms of instructions in class. In the answers, statistically relevant difference was obtained at the level of 0.01.

As possibilities to use for *assessment of student's knowledge* the teachers were offered the following choices: 1) tests made according to previously set standards, 2) ways of knowledge assessment change depending on the composition of the class and situation and 3) using a variety of assessment techniques which respect the student's individual achievements (Table 6).

Table 6. Assessment of students' knowledge

	Realist	Contextualist	Relativist	Total
Test according to standards	19.8%	4.5%	7%	9%
Depending on the composition of the class	32.67%	47%	20%	36.7%
A variety of assesment tehniques	47.52%	48.5%	73%	54.3%

The obtained level of statistical significance $\chi^2(4, N=401) = 40.449, p = .000$ indicates the existence of statistical significance at the level of 0.01 between the realistic, contextualistic and relativistic teacher profiles. Overall, regardless of the chosen teaching profile and teaching approach (realist, contextualist and relativist), the teachers show that they possess teaching competences because they claim to use various assessment techniques which respect the student's individual achievements.

Discussion

The research findings partly support the findings of previous research (Bay et al., 2014; Lee, Zhang, Song & Huang, 2013; Levitt, 2001; Sang, Valcke, van Braak & Tondeur, 2009; Schraw & Olafson, 2003), pointing to the fact that the teachers included in the research sample mostly claimed that they belong to the constructivist profile, the teachers' answers showed that their own work in practice differs to a certain degree from their self-assessment of the profile. Namely, even though the participants were convinced that they belong to some of the teacher profiles with sophisticated epistemological beliefs, they often described their concrete work in teaching practice in terms that are linked to naive epistemological beliefs, especially when it comes to teaching which refers to the forms of instruction in class, assessment of significant outcomes of students' learning, as well as the role of students in teaching. Our findings are not completely in accordance with some previous research (Hashweh, 1996), which has shown that teachers' beliefs remain stable and firmly connected to teachers' strategies – constructivist teachers put greater value on students; alternative ideas and thus the use a multitude of teaching strategies. Our research shows that the teachers do not leave the commanding or main role in class easily, which is also shown in the fact that all the three groups most often use forms of instruction which have characteristics of the transmission teaching method.

Limitation of the research refers, mainly, to the section of the research sample. The questionnaire was filled out by exclusively highly motivated and interested teachers, so generalizations of conclusions are limited. The limited possibilities for conclusion generalization also results from the fact that the sample consisted of teachers from Serbia. Hofer (2010) suggests that difficulties in research in this area can be found in different teaching practices and educational philosophies in different countries. Another limitation of this research is that it is based on quantitative methodology and, therefore, is based on the teacher, self-assessment and indirect insights into their activities.

Since the obtained research results show similarities to and differences from previous research findings in this area (Abbel & Roth, 1995; Bay et al., 2014; Haney et al., 2002; Hashweh, 1996; Kang & Wallace, 2004; Lee et al., 2013; Levitt, 2001; Mitchener & Anderson, 1989; Sang et al., 2009; Schraw & Olafson, 2003), an adequate step would be a more comprehensive study based on quantitative and qualitative methodology and focused on gathering of more detailed data on the relation between teachers' epistemological beliefs and their practical work, with the use of monitoring techniques and interviews. Research which would include students' point of view would also be of use. When it comes to contribution of the research, its theoretical and practical significance can be stressed. While on the one hand the research contributes to the corpus of knowledge on teachers' personal epistemologies, on the other hand it opens up the possibility for improvement of the process of education of pre-service teachers as well as in-service ones.

Conclusions

The results obtained in this research indicate the following: 1) the teachers do not always have clear epistemological world views because in their answers to questions of concrete actions in teaching practice, i.e., practice linked to assessment of significant outcomes of students' learning, the role the students play during their lessons, the ways in which they give instruction as well as answers concerning the practice of students' knowledge evaluation and, to a certain degree, choose characteristics which are inconsistent with the self-assessment of personal epistemology and teaching approach; 2) an incentive for teachers is necessary so as to make them think over their personal epistemological beliefs with the goal of noticing personal ways of building their work and improvement and 3) experience in teachers' professional development ought to include possibility of discussion and consideration of relations between beliefs and concrete work, i.e., to encompass possibilities of linking teachers' epistemological beliefs and their teaching practice.

It is certain that the new guidelines and suggestions regarding teacher education should be directed towards teachers' awakening of their personal epistemologies, i.e., of improving epistemological beliefs in the sense of transformation of naive into more sophisticated epistemological beliefs. This is especially important since research (Brownlee, Purdie & Boulton-Lewis, 2001) has shown that teacher education curriculum, which e.g., includes a written reflection and group discussion on epistemological beliefs have an influence on teachers' beliefs and lead to changes

in teaching practice in the sense of increased practice of the student-centered approach and lessening in reliance on textbooks and the lecturing method of teaching. Our research has shown there is an incomplete correspondence between teachers – beliefs and their everyday practice. It represents a contribution to the identification and discussion of relations between teachers' beliefs and concrete practice.

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