

Investigating the Implementation Degree of the National Teacher Professional Standards in Mathematical Educational: Courses from the Pre-service Teachers' Perspectives in Jordan

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Abstract

The aim is to investigate the implementation degree of the national teacher professional standards in the university mathematical educational courses from pre-service teachers' perspectives in Jordan. A questionnaire with 36 items was collected from 380 pre-service teachers, (195) students from the University of Jordan and (185) students from the Hashemite University. It consisted of five dimensions (academic and special pedagogical knowledge, planning, implementation instruction, assessment of students' learning and instruction, and self development).The findings indicated the implementation degree of the national teacher professional standards in the mathematical educational courses from pre-service teachers' perspectives in Jordan was medium. There were no significant differences between students' perspectives with respect to the specialization area but there were significant differences with respect to the university in behalf of the University of Jordan. The researcher recommended reviewing the mathematical educational courses at the university level.

Keywords: professional teacher standards, teaching mathematics, pre-service teachers, national standards, Jordan.

Introduction

Teacher professional standards are the premise for establishing and developing the professional career of teachers, and the essential evidence of evaluating their teaching quality. Building up the professional standards for education is the basal sign for teaching as a profession; it is also the core content to set up the standards system of teacher education. Therefore, studying and improving teacher professional standards has been a highlight in Jordan since 1980's. The interest and concern on teacher professional standards started in Jordan from the National Conference for Developing Teaching and Learning held in 1987.

Of all the elements that produce effective schools, the most important is the quality of its teachers. However, defining exactly what makes a great teacher is harder than it may look. Experts, politicians, and education leaders all have their own perspectives regarding what effective teaching looks like. Effective teaching standards have several purposes. Teachers apply those standards to evaluate their own teaching styles and assessment strategies, school administrators apply them to assess teachers. Furthermore, universities faculties apply them to evaluate their own educational programs and courses.

In light of the information revolution, the scientific challenge, and the globalization, it is essential to enhance new teacher professional preparation programs for pre-service teachers. According to Bullough (2002) and Nurray (2000), the university programs for pre-service teachers are expected to prepare teachers to manage the needs for their students. Also, it is necessary to improve and evaluate the existing training programs for in-service teachers supported by the Jordanian Ministry of education and the Jordanian universities.

The society needs teachers who are well-prepared to face new educational settings by being well-equipped with professional life skills which are required by the modern educational trends. In 2003, the Jordanian Ministry of education started a tremendous project, named the Education Reform for Knowledge Economy (ERFKE). The Jordanian Ministry of Education has achieved potential progress in the dimensions of school curricula reform, textbooks review, national examinations, enhancement of teaching strategies, and improvement of learning evaluation. These improvements mean that more attention must be focused on teachers' professional life skills, in order to achieve the objectives of ERFKE.

In May 2006, the National Teacher Professional Standards Conference was held for three days in Amman, Jordan. Experts from the Jordanian Ministry of Education, public and private Jordanian Universities, along with Canadian, Australian, American, and European consultants shared their national educational experiences. They developed a set of National Teacher professional standards to guide professional development for instruction, teaching and learning.

Related literature review

Fleischmann (2010) examined the perceptions of middle school teachers regarding the components in their preparation during the first three or four years of teaching that may influence their methods of teaching and assessment. The researcher applied a questionnaire framed with "Model Standards for Beginning Teacher Licensing and Development Standards" published by The Interstate New Teacher Assessment and Support Consortium (INTASC). The findings indicated that more than half the teachers see students' teaching as having a higher impact on their teaching methods.

Endfingher (2009) investigated the perceptions of elementary teachers on the professional development received by the school in meeting the state technology standards. The researcher used a questionnaire distributed among elementary schools teachers in 16 schools representing three school systems. The results revealed that most teachers meet the state technology standards. Although, the teachers perceived weakness in meeting some of the standards, the availability of technology resources and the lack of technology related to professional development were barriers to successful technology integration.

Croshaw (2008) conducted a study to determine the impact of effective administrative behaviors on teachers who participated in a professional development activity such as the National Board for Professional Teaching Standards (NBPTS). The findings indicated that six out of 13 effective administrative behaviors constructs built by the researcher were identified as having an impact on (NBPTS). Also, there were significant levels of correlations within the six identified constructs. Crane (2008) conducted a study aimed at investigating rural elementary school teachers' perceptions regarding elementary school science reform goals and their opinions about factors that may facilitate and constrain them in the rural schools. The researcher interviewed the teachers and took field notes. The findings revealed that the majority of the rural elementary teachers believe that they lacked the ability to be good science teachers, they felt uncomfortable teaching science. Consequently, they had poor attitude toward science, science education, and science education teaching standards.

Statement of the Problem

In general, based on the researcher knowledge, there is a lack of research studying the implementation degree of the national teacher professional standards in the university courses from pre-service teachers' perspectives, especially in Arab countries. After the process of reviewing relates studies, the researcher found few Arabic studies conducted on the effectiveness of computerized curriculum on learning life skills. While the researcher couldn't find any study investigating the implementation degree of the national teacher professional standards in the university mathematical educational courses from pre-service teachers' perspectives in Jordan. In other words, studying the relation between the universities mathematical educational coursed for generalist and for early childhood teachers and the national teacher standards. Furthermore, the researcher discussed those educational issues with different generalist and early childhood in-service teachers. Many of them mentioned that they teach as they are used to teach, they don't teach to meet the nation standards. While few of them mentioned that they don't even know what it means.

The Purpose of the Study

The purpose of this study was to identify the implementation degree of the national teacher professional standards in the university mathematical educational courses from pre-service teachers' perspectives at the University of Jordan and the Hashemite University in Jordan.

Definitions of terms

- Nation teacher standards: the professional and personal competencies that Jordanian teachers from grade 1-12 are recommended to meet and satisfy. In this study it has five dimensions: academic and special pedagogical knowledge, planning for instruction, implementation of instruction, assessment of students' learning and instruction, and self development.

- Pre-service early childhood teachers: undergraduate students from the College of Educational Sciences at the University of Jordan or the Hashemite University who passed the university mathematical educational courses and are expected to be kindergartner teachers after graduation.
- Pre-service elementary teachers: undergraduate students from the College of Educational Sciences at the University of Jordan or the Hashemite University who passed the university mathematical educational courses and are expected to be teachers for the first three grades after graduation.

The Research questions

The research questions of the study are:

1. What is the implementation degree of the national teacher professional standards in the mathematical educational courses from pre-service teachers' perspectives in Jordan?
2. Are there any differences in the implementation degree of the national teacher professional standards in the mathematical educational courses from pre-service teachers' perspectives in Jordan with respect to the area of specialization (pre-service elementary teachers and pre-service early childhood teachers)?
3. Are there any differences in the implementation degree of the national teacher professional standards in the mathematical educational courses from pre-service teachers' perspectives in Jordan with respect to the University (the University of Jordan and the Hashemite University)?

The study population

The study population consisted of all undergraduate students in College of Educational Sciences at the University of Jordan and all undergraduate students in College of Educational Sciences at the Hashemiyya University who passed the mathematical educational courses.

The Sample of Study

The sample consisted of (380) students who passed the university mathematical educational courses. They were selected as follows: 195 students from the Educational Sciences College at the University of Jordan. They were distributed as (95) pre-service early childhood teachers and (100) pre-service elementary teachers. Furthermore, (185) students were selected from the Educational Sciences College at the Hashemite University. They were distributed as (89) pre-service early childhood teachers and (96) pre-service elementary teachers. Table (1) shows the distribution of the sample.

Table (1) The Distribution of the Sample with respect to the Specialization Area and the University

Specialization Area	The University of Jordan	The Hashemite University	Total
pre-service early childhood teachers	95	89	184
pre-service elementary teachers	100	96	196
Total	195	185	380

The Instrument of the Study:

The researcher applied the Nation Professional Teacher Standards (Ministry of Education, 2006). The instrument consisted of 36 positive items, using a 5-point Likert-type scale. These items are evaluated as follows:

1. To item that is not applied at all,
2. To item that is applied in a low degree;
3. To item that is applied in a medium degree,
4. To item that is applied in a large degree,
5. To item that is applied very much.

Items of the instrument were distributed among the following seven dimensions:

1. Dimension of academic and special pedagogical knowledge, items (1-5)
2. Dimension of planning for instruction, items (6-11)
3. Dimension of implementation of instruction, items (12-20)

4. Dimension of assessment of students' learning and instruction, items (21-28)
5. Dimension of self development, items (29-36) (See Appendix).

Content validity was established before conducting the study by distributing the instrument to some experts from the faculty of Educational Sciences at the University of Jordan, Hashemite University, and Alyarmouk University. The primary version of the instrument consisted of 52 positive items. The instrument judges examined the instrument and agreed that it did assess what it was supposed to assess, they modified and rephrased few words to be understood by the participants and they deleted 16 items. Additionally, the researcher assessed the reliability of the instrument by using Cronbach's Alpha, as a measure of consistency coefficient. The instrument was distributed to (54) students from the population of the study. Those students were not included in the sample of the study. It was calculated to find the internal-consistency of reliability for the instrument. The result showed that the reliability coefficient was (0.85) for the measure, which means that the instrument was reliable.

Variables of the Study

The independent variable was the instrument. While, the dependent variable was the pre-service teachers' perspectives and the classified variables were the university and the specialization area.

Data Analysis

Means, standard deviation, partial deviation coefficient, and t-test were used as the appropriate statistical tools to test the research questions. Based on the research questions, data was analyzed using the Statistical Packages for Social Sciences (SPSS) version 17.0. The (0.05) level of significance was selected to determine if any differences between the groups were statistically significant.

Discussion of the Finding of the Study

To answer the first questions which identifying the implementation degree of the national teacher professional standards in the university mathematical educational courses from pre-service teachers' perspectives in Jordan, the researcher calculated the means, the standards deviation, and the partial variation coefficient for every dimension from the five dimensions and for the overall instrument. Table (2) shows the means, standards deviation, and the partial deviation coefficient for the responses of all the participants.

Table 2: The Means, Standards deviation, and the Partial Deviation coefficient

Dimension	Mean Max value (5)	SD	Partial deviation coefficient
Academic pedagogical knowledge	3.3	0.98	18.57
Planning for instruction	2.6	1.87	18.69
Implementation instruction	3.2	0.90	20.72
Assessment of students' learning	2.6	1.78	19.05
Self development	2.5	1.67	19.67
Overall	2.9	1.85	19.92

From table (2), the findings indicated that the means for the five dimensions ranged from 2.5-3.3 Academic pedagogical knowledge dimension has the highest mean of 3.3, while self development dimension has the lowest mean of 2.5. The mean for the overall dimension was 2.9 out of 5. The partial deviations coefficients for every dimension and for the overall dimension were high. They ranged from 18.57 to 20.72 this is an indication that the responses of the participants were very close to each other.

To investigate if the implementation degree of the national teacher professional standards in the university mathematical educational courses from pre-service teachers' perspectives in Jordan is statistically significant, one sample t- test was applied. Table (3) displays the results of applying t-test for testing the implementation degree of the national teacher professional standards.

Table (3) T-Test Analysis for the Instrument

Dimension	T value	Sig
Academic pedagogical knowledge	34.45	.000
Planning for instruction	27.17	.001
Implementation of instruction	29.56	.002
Assessment of students' learning	27.66	.001
Self development	30.71	.001
Overall	31.90	.001

It can be seen from table (3) that the implementation degree of the national teacher professional standards in the university mathematical educational courses from pre-service teachers' perspectives in Jordan for each of the five dimensions and for the overall dimensions was statistically significant.

In order to answer the first question, the researcher describes the implementation degree of the national teacher professional standards, if it is high, medium, or low. Table (4) provides categories that describe the implementation degree of the national teacher professional standards.

Table (4) the categories of the implementation degree

Mean range	Category
$1 \leq \text{mean} < 2.5$	Low
$2.5 \leq \text{mean} \leq 3.5$	Medium
$3.5 < \text{mean} \leq 5$	High

The categories in table (4) were considered based on the opinions of the referee panel and related research and literature, such as: Ababneh (2005), and Almatarneh (2003). Table (2) and table (4) show that the implementation degree of the national teacher professional standards for each one of the five dimensions and for the overall dimensions was medium since the means are higher than 2.5 and less than 3.5

The explanation for this result could be because the gap between what and how the members at educational colleges in the university teach and what the school and society need is large. Also, another reason could be because the cooperation between educational faculties and the Jordanian Ministry of Education is weak and needs improvement.

To answer the second questions which identifying any significant differences in the implementation degree of the national teacher professional standards in the university mathematical educational courses from pre-service teachers' perspectives in Jordan with respect to the specialization area the researcher calculated the means, the standards deviation, and t test for every dimension. Table (5) shows the means, standards deviation, and t values for the responses of all the participants on national professional teacher standards with respect to their specialization area.

Table 5: Scores Analysis of the Instrument with respect to the specialization area

Standards Dimensions	Pre-service Early Childhood teachers		Pre-service Elementary Teachers		T Value	Sig. Level
	M	SD	M	SD		
academic pedagogical knowledge	12.51	1.34	13.76	2.41	.854	.354
Planning for instruction	16.21	2.54	17.54	2.33	1.65	.133
Implementation instruction	25.46	1.67	24.66	1.98	.874	.560
assessment of students' learning	22.76	2.43	23.43	3.04	.844	.347
self development	20.55	2.24	22.41	3.17	1.56	.139
Overall	97.49	4.78	101.8	4.21	.978	.407

Based on table (5), it is clear that there are differences between the implementation degree of the national teacher professional standards with respect to the area of specialization. The means for the responses of the pre-service elementary teachers ranged from 13.51 to 24.66 and the means for the responses of the pre-service early childhood teachers ranged from 12.51 to 25.46 in order to decide if those differences are statistically significant, the researcher applied t-test. It is apparent that those differences are not statistically significant because the t-values are from 0.844 to 1.65.

From the researcher opinion, the explanation could be due the fact that the educational mathematics courses that pre-service early childhood teachers and pre-service elementary teachers took are supported by the same faculties and normally taught by the same instructors. Furthermore, the content and the teaching strategies for instructing pre-service early childhood teachers and pre-service elementary teachers are very similar and focus on basic conceptual mathematical facts which may lead to non significant differences between the responses of the pre-service teachers. To answer the third questions which identifying any significant differences in the implementation degree of the national teacher professional standards in the university mathematical educational courses from pre-service teachers' perspectives in Jordan with respect to the university, the researcher calculated the means, the standards deviation, and t test for the instrument. Table (6) shows the means, standards deviation, and t values for the responses of all the participants on national professional teacher standards with respect to the university.

Table 6: Scores Analysis of the Instrument for the Participants with respect to the University

Dimensions	Hashemite University		University of Jordan		T Value	Sig. level
	M	SD	M	SD		
Academic pedagogical knowledge	13.02	2.37	15.40	2.74	18.42	.000
planning for instruction	15.57	3.76	17.88	3.21	16.04	.001
Implementation instruction	23.46	1.88	26.68	1.76	20.21	.002
assessment of students' learning	22.56	2.65	26.08	3.66	15.77	.002
self development	21.03	2.41	25.49	2.64	19.83	.000
Overall	95.64	4.67	111.53	4.41	37.03	.001

Based on table (6), it is clear that there are differences between the implementation degree of the national teacher professional standards with respect to the university. The means for the responses of the pre-service teachers from Hashemite University ranged from 13.02 to 23.46 and the means for the responses from the University of Jordan ranged from 15.40 to 26.68 in order to decide if those differences are statistically significant, the researcher applied t-test. It is apparent that those differences are statistically significant because the t-values are from 15.77 to 20.21

The explanation for this result could be due the fact that the members of the educational faculty at the University of Jordan have larger number of years in teaching, so their teaching experiences are more advanced than the teaching experiences of the members of the educational faculty at the Hashemite University. In addition to that, the University of Jordan administrative board is seeking achievement of total quality and improving the university development framework to be a research university by 2015, this mission encourages faculty members to enhance their teaching styles and improve the university study plans. Furthermore, the University of Jordan encourages and supports the faculty members in attending local or international conferences and workshops to exchange knowledge and experiences. That process affects content knowledge, teaching styles, assessment tools, and self professional development.

Recommendation

Based on the results of the study, the researcher recommended the following:

1. Reviewing universities and colleges courses plans and study plans frequently to make it more applicable.
2. Building the educational study plans and courses plans for pre-service teachers in a way that matches national professional teacher standards.
3. Conducting similar studies with different universities courses and different standards.
4. Conducting similar studies with different universities students.

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Appendix

The instrument of Nation Professional Teacher standards

The questionnaire for identifying the implementation degree of the national teacher professional standards in the mathematical educational courses from pre-service teachers' perspectives in Jordan

Demographic information:

Specialization area:

1. pre-service elementary teachers
2. pre-service early childhood teachers

University:

1. University of Jordan
2. Hashemite University

No	The Items	5	4	3	2	1
	After passing the math education courses I think that it helped me to:					
1	Demonstrate understanding of basic ideas of the subjects that he/she teaches and their interrelationships					
2	Demonstrate understanding of modes/ways of learning pertinent to the subjects that he/she teaches					
3	Demonstrate knowledge of relations among the subjects that he/she teaches and other school subjects					
4	Demonstrate the ability to present content of subjects in learnable forms and modalities					
5	Demonstrate knowledge of basic information sources relevant to the subjects that he/she teaches					
6	Design coherent instructional plans in light of the intended learning outcomes and in accordance wit the curriculum standards of the subjects that he /she teaches					
7	Demonstrate understanding of principles of student learning and development and uses them in planning for instruction					
8	Demonstrate knowledge of accessible learning resources in schools and community including those of ICT, and uses them in planning for instruction					
9	Demonstrate knowledge of instructional strategies and chooses those that match the needs and learning styles of his /her students					
10	Design interactive learning activities					
11	Design interactive learning environments that emphasize safety, participation and cooperation					
12	Be flexible in adapting a teaching plan to accommodate changing teaching / learning situations and students' needs					
13	Use appropriate resources for learning including ICT, in light of the intended learning outcomes and students' diversity and learning .needs					
14	Organize safe and caring interactive learning environments					
15	Use successfully appropriate classroom management strategies and techniques					
16	Deal effectively with students' problematic behavior .					
17	Use effectively chosen instructional strategies					

18	Demonstrate during instruction a clear focus on developing students' critical and creative thinking					
19	Communicate effectively with students to facilitate their learning and development					
20	.Show care towards all students					
21	Demonstrate understanding of linkages among assessment , instruction and learning outcomes					
22	Choose and/or designs varied and appropriate tools and means for assessing students' learning and progress , including ICT tools and uses them effectively					
23	Keep accurate records of students' learning and progress in view of intended learning outcomes using ICT tools					
24	Effectively communicate with parents about their children's learning and progress					
25	Effectively communicate with the school principal and the education district about students' learning and progress					
26	Provide opportunities for students to self-assess their learning and progress					
27	Analyze students' performance and provides them with feedback about their learning and progress					
28	Design and implement appropriate learning activities as needed to promote students' learning in view of their learning assessment results.					
29	Reflect on my teaching in view of students' learning and improves accordingly					
30	Use ICT tools and resources to develop my knowledge and ability to teach					
31	Participate in educational conferences , forums and courses					
32	read educational journals and periodicals					
33	Participate in school and district educational development projects and activities					
34	Cooperate with teachers in my school to develop professionally					
35	Communicate with teachers in other schools to develop professionally.					
36	Show interest in raising my academic qualification					

1. To item that is not applied at all,
2. To item that is applied in a low degree;
3. To item that is applied in a medium degree,
4. To item that is applied in a large degree,
5. To item that is applied very much.