Universal Journal of Educational Research 2(8): 551-563, 2014 http://www.hrpub.org
DOI: 10.13189/ujer.2014.020804

Level of Self-Efficacy of Prospective Mathematics Teachers on Competencies for Planning and Organizing Instruction

İsmail Şan

Department of Education, Faculty of Education, Inonu University, Malatya, Turkey

Abstract The purpose of this study was to determine the level of self-efficacy of prospective mathematics teachers (PMTs) on the competency "planning and organizing instruction" that is one of the teacher competencies identified in 2009 by Ministry of Education. The sample of this study consists of 111 total prospective teachers (PTs) study in mathematics department of Faculty of Science and Faculty of Education, in Inonu University, in Turkey. To determine the level of self-efficacy on teacher competencies of PMTs, "Scale for Self-efficacy on the Competence of Planning and Organizing Instruction" was prepared and used by researcher. "Subject-Specific Competencies" published by Ministry of Education (2009) was used to prepare the scale. In this study, the levels of self-efficacy of PMTs on planning and organizing instruction and the variables that affect the levels were tried to determine. According to data, the level of self-efficacy on teacher competencies of PMTs both is adequate and has some differences in terms of some demographical variables. In addition, a few new teacher competencies were identified by researcher using the PMTs' views.

Keywords Prospective Teachers, Self-Efficacy, Teacher Competencies, Teaching Mathematics

1. Introduction

In this century, the rapid alteration and development experienced at science and technology naturally seen on educational sciences too. However, the struggle for turning to student-centered education; teachers' role on education process is incontrovertible. Turkish National Ministry of Education (TNME) showed its consciousness about this importance by preparing the teacher competencies.

Due to metamorphosis of societies and the world, educational goals are changing. The missions and the responsibilities of Turkish Education System were announced as following: *"raising people that adopt national and the universal values and solve problems; act in pursuance of national education and curriculums; learn how to learn"(DPT, 2000).*

TNME and universities sometimes cooperated for increasing the quality of teachers. Research and Development Department of Education (RDDE) specified the "Profile for Modern Teacher (PFMT)" in 1999. According to RDDE, modern teacher must have the following features.

- Being qualified enough to prepare students for future,
- Dominating his/her subject area,
- Knowing students,
- Planning teaching process
- Using teaching methods and techniques according to subject will be represented.
- Communicating positively with student,
- Designing the teaching environment appropriate for students and the subjects
- Helping student to participate courses actively
- Knowing the rights and responsibilities of teachers.

However, modern teacher should;

- be active about social, cultural and sports activities,
- provide coordination between schools and other institutions,
- be able to detect disruptions of educational systems and suggest solutions for them,
- be careful for his/her fig,
- be able to produce new ideas,
- be unprejudiced,
- improve himself/herself always,
- like teaching and children,
- be respectful to the democratic values and human rights (İlhan, 2004).

In 2001, TNME notified The Council of Higher Education (CHE) about that competencies expected teachers to have. Teacher competencies classified and published in pursuance

of PFMT. These competencies were pedagogy, general culture and subject-specific competencies.

In 2002, Commission for Teacher Competencies (CTC), accumulated for the necessity of preparing the details of teaching competencies, determined detailed 206 sub-competencies in 14 main-competencies. The framework of generic competencies on teaching was constituted of 6 main-competencies, 38 sub-competencies and 251 performance indicators. These were appropriated and insured by TNME. The main competencies are following.

A. Personal and professional values
B. Knowing students
C. Educational process
D. Monitoring and evaluating learning and development
E. Relations of school, family and society
F. Knowledge on curricular and content

On the other hand, it was noticed that competency areas had been general for teachers and pointed out the importance of defining "subject specific competencies" for all courses by academics. Thereon, TNME and universities turned their studies to defining subject-specific competencies for all courses (Şahin, 2004). After detailed studies, new competencies for all courses were defined. The competencies, which were specified for elementary level mathematics teacher, are following.

Subject-specific competencies for elementary mathematics teachers

A. *Planning and designing educational process*
B. *Competencies on subject areas of mathematics courses*
C. Improving Mathematics courses skills
D. Monitoring, evaluation and improving of teaching mathematics
E. Building cooperation with school, families and society.
F. Realizing professional improvement

The competencies can be thought as skills that a teacher must have. This obligation makes us to reorganize the curricular for training of primary mathematics teachers due to the competencies.

Similarly, a framework document for high school mathematics teachers was prepared. This study seems primary mathematics teachers' competencies. This framework has the following competencies.

Subject-specific competencies for high school mathematics teachers-framework study

A. Knowing mathematics
B. Knowing teaching mathematics
C. Attitude, faith and value towards Mathematics
D. Professional development and social works (MEB-ÖYEGM, 2009)

The performance indicators of the above competencies were prepared and high school mathematics teachers are expected to indicate 83 performance indicator. TNME has embodied and standardized its expectations from teachers by defining these indicators. In this context, teacher training institutes are expected to teach PTs to gain these competencies.

2. Literature Review

The self-efficacy level of PMTs on teacher competencies is worth to investigate. According to some researches (Gibson and Dembo 1984, Enochs and Riggs 1990, Bandura 1997, Özkan et al. 2002, Scholz et al. 2002, Tschannen-Moran and Hoy 1998, Yavuzer and Koç, 2002) behaviors are effected by believes. Fulfilling the tasks and responsibilities needs teacher to be well educated and to have self-efficacy about performing them. Self-efficacy is described as "belief towards his/her potential to organize, fulfill and success a task (Bandura, 1994). According to Bandura, self-efficacy is based on our abilities and necessary to reach, organize and realize a behavior (Schmitz and Schwarzer, 2000). People have optimistic or pessimistic opinions that affect them about getting ready for behavior due to their self-efficacy before acting. Also, self-efficiently people have stronger and more permanent struggle than inefficacy people (Bandura 1977, 1994, Scholz et al. 2002). A teacher's self-efficacy level affects students' motivation and success. High level self-efficacy helps teachers about to use learning methods, materials, feedbacks and to find the right classroom design (Tschannen- Moran and Hoy 2001, Özkan et al. 2002). If a teacher is persuaded that methods' yields he/she pays attention to all details of that method and diversifies feedback ways (Gibson and Dembo, 1984). The results of studies, which investigate the relation between teachers' self-efficacy level and students' academic success show that teachers' self-efficacy level affects students' success and attitude positively (Gibson and Dembo 1984, Tschannen-Moran et al. 1998). Bandura claimed that preparing a classroom environment to develop students' cognition needs a high level teaching competence and self-efficacy of teachers (Yavuzer and Koç, 2002).

The performance indicators, in other words a more detailed form of generic teacher competences are valuable for teacher training institutes. In pursuant of these competencies, in Turkey, teacher training services are forced to revise their goals and develop new curricular to train teachers. In companion with this situation, a lot of studied have been held by researchers. Şeker, Deniz & Görgen (2005) investigated the prospective teachers' assessment of themselves, mentors and faculty lecturers in terms of teacher competencies. According to the study, PTs think themselves, mentors and faculty members are competent. Çakan (2004) compared elementary and secondary school teachers in terms of their in-class assessment activities and teacher perceptions toward their qualification levels related to

measurement and evaluation knowledge and skills. The results show that most of the teachers perceive themselves as unqualified in terms of measurement and evaluation applications. Kahyaoğlu & Yangın (2007) determined the views of prospective teachers about professional self-efficacy. This study indicates that PMTs self-efficacy level is lower than other PTs. Azar (2010), compared the levels of pre-service secondary science and mathematics teachers' self-efficacy and analyzed the change of this efficacy according to their demographic characteristics such as gender, graduate university, and major. The results indicate that mathematics teachers' self-efficacy is higher than Physics and Chemistry teachers. Arslan & Özpınar (2008) determined whether the qualifications required from teachers by primary school programs is in keeping with general teaching competencies provided to pre-service teachers by education faculties. According to results of this study, qualities and competencies required from teachers and PTs are harmonious.

3. Objectives

This study aims to explore;

1. The level of self-efficacy of prospective mathematics teachers about competence for planning and organizing instruction,
2. Whether there is a significant difference from the views of faculty, academical success, learning type, interests and knowing the competencies for mathematics teachers or not.

4. Method

The descriptive survey method was used for this study. The population of this study is constituted from all PMTs studying at Faculty of Education and Faculty of Science in İnönü University. Total 111 PMTs took place in this research.

"The Scale for Self-efficacy on Competence on Planning and Organizing Instruction" was prepared and used by researcher for this survey. The scale is a kind of check list and constituted from 121 items.

The scale used for this survey;

1. contains all of the sub-competencies related to planning and organizing instruction defined by TNME, in 2009.
2. is harmonious with scales used other surveys trying to explore self efficiacy levels.

The first feature means that the scale has content validity and the second feature means that the scale has adjustment validity. After that, it was examined by experts to get construct validity and done some changes.

The Spearman Brown reliability analysis was used and the internat consistency of the scale was determined 0,998. So that, the scale is valid and reliable to use for this survey.

5. Findings

The findings of the study are presented in the order of the research questions. First of all the characteristics of the sample of this survey is mentioned. Academic success of sample has a normal distribution and most of them are both from Faculty of Science (FS) (%59,5) and dual (%72,1) students. Also going to cinema (%60,4) is the most interested activity for prospective mathematics teachers.

The most effective factors to choose being a mathematics teacher are loving mathematics (%59,5), prestige (% 24,3), salary (%18,9) and orientation of family. On the other side, orientation of friends (%1,8) and teachers (%6,3) or loving children (%7,2) haven't big effect for the sample. The ways for monitoring news by sample are mostly internet (%81,1), newspaper (%55,9) and TV (%53,2) (see appendix (table 1)).

Findings on Use Needs Analysis Techniques

The analysis revealed that tests (% 52,3) and natural observation (% 52,3) are the leading techniques among the sample. The other dominant techniques are interviews (44,1), literature review (44,1) and job analysis. On the other hand, progel-dacum (7,2) and Delphi (%6,3) are the less common techniques. Table 2 presents the frequencies of the sample about using needs analysis techniques. After that, t-test was applied to introduce whether there was relationship between knowledge on subject specific competencies (SSC) and frequencies of needs analysis techniques, or not. Table 3 presents the results. Table 3 shows that there are significant differences about using some needs analysis techniques according to knowledge on SCC. According to this data PTs that know SSC are better about using Progel-Dacum, Delphi, Natural Observations, Interviews and Literature Review techniques than others. So we can say that, PTs that know SSC have a bigger self-efficacy than the others about determining the needs of education. Also, two t-tests were applied to introduce whether there were relationship between knowledge on subject specific competencies (SSC) and firstly faculties and secondly learning types, or not. The results showed there weren't any difference. Also ANOVA was applied to introduce whether there were relationship between Knowledge on SSC and academic success, or not. According to the results, there wasn't any difference, neither.

Table 2. Frequencies on Use Needs Analysis Techniques

Needs Analysis Techniques	Can Use		Can't Use	
	n	%	n	%
Tests	58	52,3	53	47,7
Natural Observation T.	58	52,3	53	47,7
Interview T.	49	44,1	62	55,9
Literature Review	49	44,1	62	55,9
Job Analysis T.	34	30,6	77	69,4
Attitude Scale	26	23,4	85	76,6
Delphi T.	7	6,3	104	93,7
Progel-Dacum T.	8	7,2	103	92,8

Table 3. t-test for Using Needs Analysis Techniques by Knowledge On SSC

	Knowledge on SSC	f	Mean	Std. Dv.	df	t	p
Progel-Dacum	Yes	72	0,11	,316	1	2,1	,031*
	No	39	0,00	,000			
Delphi	Yes	72	0,10	,298	1	2,0	,045*
	No	39	0,00	,409			
Tests	Yes	72	0,61	,491	1	2,6	,011*
	No	39	0,36	,486			
Natural Observation	Yes	72	0,61	,491	1	2,5	,011*
	No	39	0,36	,486			
Interviews	Yes	72	0,54	,502	1	2,9	,003*
	No	39	0,26	,442			
Literature Review	Yes	72	0,51	,503	1	2,1	,037*
	No	39	0,31	,468			

*p< 0,05

Table 4. Frequencies on Prepare and Use Scale Types

Scale Types	Can Use		Can't Use	
	n	%	n	%
Observation forms	43	38,7	68	61,3
Leisure time activities	43	38,7	68	61,3
Attention tests	41	36,9	70	63,1
Scale of reason for failure	39	35,1	72	64,9
Social adjustment tests	34	30,6	77	69,4
Test anxiety s.	34	30,6	77	69,4
Study habits assessment s.	32	28,8	79	71,2
Self-assessment questionnaire	31	27,9	80	72,1
Peer appraisal	30	27,0	81	73,0
Interest tests	30	27,0	81	73,0
Critics questionnaire	28	25,2	83	74,8
Anxiety level s.	27	24,3	84	75,7
Parents assessment s.	26	23,4	85	76,6
Happiness s.	25	22,5	86	77,5
Memory tests	23	20,7	88	79,3
Guess who questionnaire	23	20,7	88	79,3
Sosyometry s.	21	18,9	90	81,1
Perceived family support s.	19	17,1	92	82,9
Academic self-concept s.	19	17,1	92	82,9
Self-directed learning readiness s.	18	16,2	93	83,8
Vocational maturity s.	16	14,4	95	85,6

Findings on Indicators about Prepare and Use Scales

The analysis revealed that observation forms (% 38,7) and leisure time activities questionnaire (% 38,7) are the leading form types among the sample. On the other hand, vocational maturity scales (% 14,4), self-directed learning readiness scales (%16,2) and perceived family support scales (17,1) are the less common techniques. Table 4 presents the frequencies of the sample about preparing and using scales. After that, t-tests were applied to introduce whether there were relationship between preparing and using scale types between firstly faculties, secondly learning type and thirdly knowledge on SCC, or not. According to these t-tests there wasn't any difference between groups. Also ANOVA was applied to introduce whether there were relationship between preparing and using scale types and academic success, or not. According to the results, there wasn't any difference, neither.

Findings on Use Learning Materials

The analysis revealed that books (% 78,4), graphics (%64), geometrical shapes (%61,3) and blackboard are the leading materials among the sample. The other dominant materials are 3D models (%59,5) and geometry boards (%49,5). On the other hand, cubic set (%13,5), decoration set (%14,4), transparent fraction cards (%14,4) and square set (%15,3) are the less common techniques. Table 5 presents the frequencies of the sample about using learning materials. T-test was applied to introduce whether there was relationship between using learning materials and faculties, or not. Table 6 presents the results. According to table 6, there are differences between FE and FS nearly for all materials. The differences are in FE's favor. This results shows that PTs from FE have bigger self-efficacy than from FS. T-test also was applied to introduce whether there was relationship between using learning materials and knowledge on SSC, or not. Table 5 presents the results. Table 5 shows that there are significant differences about using some learning materials according to knowledge on SCC. According to this data PTs that know SSC are better about using isometric paper, 3D-models, punctuated paper, models and samples, geometry boards, fraction bars, tangram, blackboards than others. So we can say that, PTs that know SSC have a bigger self-efficacy than the others about using learning materials. After that, t-tests was applied to introduce whether there were relationship between preparing and using scale types between learning types, or not. According to the t-test there wasn't any difference between groups.

Table 5. Frequencies on Use Learning Materials

Learning Materials	Can Use		Can't Use	
	f	%	f	%
Volume set	41	36,9	70	63,1
Unit Cubes	36	32,4	75	67,6
Isometric paper	30	27,0	81	73,0
Hexagonal paper	20	18,0	91	82,0
3-D models	66	59,5	45	40,5
Pattern blocks	23	20,7	88	79,3
Punctuated paper	39	35,1	72	64,9
Square set	17	15,3	94	84,7
Models and samples	40	36,0	71	64,0
Symmetry mirror	37	33,3	74	66,7
Octagonal paper	19	17,1	92	82,9
Algebric diamonds	19	17,1	92	82,9
Maps	46	41,4	65	58,6
Geometry Boards	55	49,5	56	50,5
Rectanglar Paper	31	27,9	80	72,1
Cube set	15	13,5	96	86,5
Diagram	43	38,7	68	61,3
Fractional bars	37	33,3	74	66,7
Triangular paper	33	29,7	78	70,3
Decoration set	16	14,4	95	85,6
Graphics	71	64,0	40	36,0
Tangram	21	18,9	90	81,1
Rhombus paper	34	30,6	77	69,4
Blackboard	68	61,3	43	38,7
Cartoons	29	26,1	82	73,9
Trensparent fraction cards	16	14,4	95	85,6
Punctuated and circular paper	22	19,8	89	80,2
Base 10 blokcs	32	28,8	79	71,2
Books	87	78,4	24	21,6
Geometric shapes	68	61,3	43	38,7
Circular paper	24	21,6	87	78,4

Table 6. T-test for Use Learning Materials by Faculties

	Faculty	f	Mean	Std. Dv.	df	t	p
Volume set	FE	45	0,51	,506	109	2,551	,012
	FS	66	0,27	,449			
Unit cubes	FE	45	0,49	,506	109	3,047	,003
	FS	66	0,21	,412			
Isometric paper	FE	45	0,44	,503	109	3,362	,001
	FS	66	0,15	,361			
Hexagonal paper	FE	45	0,29	,458	109	2,336	,022
	FS	66	0,11	,310			
3D models	FE	45	0,76	,435	109	3,019	,003
	FS	66	0,48	,504			
Pattern blocks	FE	45	0,38	,490	109	3,527	,001
	FS	66	0,09	,290			
Punctuated paper	FE	45	0,60	,495	109	4,752	,000
	FS	66	0,18	,389			
Square set	FE	45	0,27	,447	109	2,569	,012
	FS	66	0,08	,361			
Models and samples	FE	45	0,67	,477	109	6,145	,000
	FS	66	0,15	,361			
Symmetry mirror	FE	45	0,49	,506	109	2,858	,005
	FS	66	0,23	,422			
Octagonal paper	FE	45	0,29	,458	109	2,569	,012
	FS	66	0,09	,290			
Maps	FE	45	0,67	,477	109	4,780	,000
	FS	66	0,24	,432			
Geometry boards	FE	45	0,67	,477	109	3,077	,003
	FS	66	0,38	,489			
Rectanglar paper	FE	45	0,42	,499	109	2,716	,008
	FS	66	0,18	,389			
Cube sets	FE	45	0,24	,435	109	2,581	,012
	FS	66	0,06	,240			
Diagram	FE	45	0,58	,499	109	3,476	,001
	FS	66	0,26	,441			
Fraction bars	FE	45	0,47	,505	109	2,435	,017
	FS	66	0,24	,432			
Triangular paper	FE	45	0,44	,503	109	2,759	,007
	FS	66	0,20	,401			
Graphics	FE	45	0,78	,420	109	2,640	,010
	FS	66	0,55	,502			
Tangram	FE	45	0,31	,468	109	2,577	,012
	FS	66	0,11	,310			
Cartoons	FE	45	0,42	,499	109	3,121	,003
	FS	66	0,15	,361			
Transparent fraction cards	FE	45	0,27	,447	109	2,825	,006
	FS	66	0,06	,240			
Punctuated circular paper	FE	45	0,36	,484	109	3,288	,002
	FS	66	0,09	,290			
Base 10 blocks	FE	45	0,42	,499	109	2,522	,014
	FS	66	0,20	,401			
Circular paper	FE	45	0,33	,477	109	2,378	,020
	FS	66	0,14	,346			

*p<0,05

Table 7. T-test on Use Learning Materials by Knowledge on SSC

Learning materials	Knowledge on SSC	f	Mean	Std. Dv.	df	t	p
Isometric paper	Yes	72	0,35	0,479	109	2,529	,013
	No	39	0,13	0,339			
3D models	Yes	72	0,68	0,470	109	2,557	,012
	No	39	0,44	0,502			
Punctuated paper	Yes	72	0,43	0,428	109	2,416	,017
	No	39	0,21	0,366			
Models and samples	Yes	72	0,43	0,499	109	2,116	,037
	No	39	0,23	0,427			
Geomtry board	Yes	72	0,60	0,494	109	3,003	,003
	No	39	0,31	0,468			
Fraction Bars	Yes	72	0,42	0,496	109	2,583	,011
	No	39	0,18	0,389			
Tangram	Yes	72	0,25	0,436	109	2,253	,026
	No	39	0,08	0,270			
Blackboards	Yes	72	0,71	0,458	109	2,892	,005
	No	39	0,44	0,502			

*p<0,05

Findings on Variables that are Thought to be Used at Courses

The variables that are thought to be used at courses by prospective mathematics teachers were investigated. The analysis revealed that question banks (% 89,2), question paper (%83,8), teacher's handbook (%68,5) and intelligence games (%68,5) are the leading variables among the sample. On the other hand, songs (%7,2), newspapers (%16,2) and magazines (% 26,1) are the less common variables. Table 8 presents the frequencies of the sample about variables that are thought to be used at courses. T-test was applied to introduce whether there was relationship between variables thought to be used at courses and faculties, or not. Table 9 presents that there is difference between PMTs that know and don't know SSC according to some variables. After that, t-tests were applied to introduce whether there were relationship between variables thought to be used and firstly faculties and secondly learning type, or not. According to these t-tests there wasn't any difference between groups.

Table 8. Frequencies about Variables are thought to be Used at Courses

Variables thought to be used at courses	Can Use		Can't Use	
	N	%	n	%
Question Banks	99	89,2	12	10,8
Question Papers	93	83,8	18	16,2
Teacher's Handbook	76	68,5	35	31,5
Intelligence Games	76	68,5	35	31,5
Operation Games	63	56,8	48	43,2
Educational CDs	53	47,7	58	52,3
Web Sites	51	45,9	66	54,1
Crosswords	44	39,6	67	60,4
Magazines	29	26,1	82	73,9
Newspaper	18	16,2	93	83,8
Songs	8	7,2	103	92,8

Table 9. t-test for Variables Thought to be Used at Courses by Knowledge on SSC

	K. on SSC	f	Mean	Std. Dv.	df	t	p
Teacher's handbook	Yes	72	0,75	0,436	109	2,031	,045
	No	39	0,56	0,502			
Magazines	Yes	72	0,33	0,475	109	2,387	,019
	No	39	0,13	0,339			
Question papers	Yes	72	0,89	0,316	109	2,000	,048
	No	39	0,74	0,442			
Web sites	Yes	72	0,54	0,502	109	2,401	,018
	No	39	0,31	0,468			
Newspaper	Yes	72	0,22	0,419	109	2,370	,020
	No	39	0,05	0,223			

*p<0,05

Table 10. Frequencies on Use Teaching Methods

Teaching Methods	Can Use		Can't Use	
	f	%	f	%
Lecture	96	86,5	15	13,5
Problem Solving	92	82,9	19	17,1
Demonstration	78	70,3	33	29,7
Questioning	77	69,4	34	30,6
Discussion	58	52,3	53	47,7
Computer-Based Teaching	57	51,4	54	48,6
Brain storming	53	47,7	58	52,3
Cooperative learning	43	38,7	68	61,3
Case study	41	36,9	70	63,1
Team teaching	35	31,5	76	68,5
Project based teaching	31	27,9	80	72,1
Programmed learning	31	27,9	80	72,1
Educational games	30	27,0	81	73,0
Story telling method	29	26,1	82	73,9
Role playing	22	19,8	89	80,2
Creative drama	21	18,9	90	81,1
Aquarium	15	13,5	96	86,5
Description	13	11,7	98	88,3

Findings on Use Teaching Methods

Using teaching methods by prospective mathematics teachers were investigated. The analysis revealed that lecture method (% 86,5), problem solving (%82,9), demonstration (%70,35) and questioning (%%69,4) are the leading variables among the sample. On the other hand, description method (%11,7), aquarium (%13,5) and role playing methods (% 19,8) are the less common variables. Table 10 presents the frequencies of the sample about using teaching methods. T-test was applied to introduce whether there was relationship between teaching methods and faculties, or not. Table 11 presents the results. According to table 11, there are differences between FE and FS for questioning, storytelling and team teaching methods. The differences are in FE's favor. This results shows that PTs from FE have bigger self-efficacy than from FS about using some teaching methods. Then, t-test also was applied to introduce whether there was relationship between using learning materials and knowledge on SSC, or not. Table 12 presents the results. Table 12 shows that there are significant differences about using some teaching methods according to learning types. According to this data PTs that from D.L. are better about using aquarium, description and storytelling methods than from N.L. So we can say that, PTs that are from D.L. have a bigger self-efficacy than from N.L. about using learning materials. T-test also was applied to introduce whether there was relationship between teaching methods and knowledge on SCC, or not. Table 13 presents the results. According to table 13, there are differences between the PTs that know SCC and don't know SCC for Computer based learning and questioning methods. The differences are in the PTs know SCC's favor. This result shows that PTs know SCC have bigger self-efficacy than don't know SCC.

Table 11. T-test for Using the Teaching Methods According to Faculties

	Faculties	f	%	Std. Dev.	df	t	p
Question and answer	FE	45	,51	,506	109	2,551	,012
	FS	66	,27	,449			
Story telling	FE	45	,49	,506	109	3,047	,003
	FS	66	,21	,412			
Team teaching	FE	45	,44	,503	109	3,362	,001
	FS	66	,15	,361			

*p<0,05

Table 12. T-Test for Using the Teaching Methods According to Learning Types

	Learning Type	f	%	Std. Dev.	df	t	p
Aquarium	N.L.	31	,00	,000	109	-2,650	,009
	D.L.	80	,19	,393			
Description	N.L.	31	,00	,000	109	-2,430	,017
	D.L.	80	,16	,371			
Storytelling	N.L.	31	,10	,301	109	-2,502	,014
	D.L.	80	,33	,371			

*p<0,05

Table 13. T-test for Using Methods According To Knowledge On SCC

	K. on SCC	f	%	Std. Dev.	df	t	p
Computer based learning	Yes	72	,58	,496	109	2,023	,047
	No	39	,38	,493			
Question and answer	Yes	72	,81	,399	109	3,646	,000
	No	39	,49	,506			

p<0,05

6. Conclusions

The sample's interests are mostly going to cinema, listening to music, internet, doing sports. This result indicates that PTs perceived university as an entertainment center and didn't interest in educational activities such as vocational, mathematical and general culture knowledge.

The most important factor to choose teaching mathemtics is loving mathematics. This is normal but on the other hand the level of loving children isn't high enough. This result indicates that PTs thinks that doing mathematics is same teaching mathematics. Loving mathematics requires to be a mathematician more than a mathematics teacher. This result could be arose from the job opportunities.

%35,1 percent of the sample doesn't know what SSC were. This is a big rate for PTs. This result indicates that PTs didn't monitore news about teaching and learning area. This also shows that there wasn't enough cooperation between TNME and universities about to share activities.

Teachers don't know enough needs analysis techniques. This result indicates that teachers aren't good enough at curriculum development. On the other hand, teachers believe that they are good at interview and natural observation techniques. The techniques don't have technical terms and PTs think that they were able to do what they could understand its name. The low rate of progel-dacum and delphi supports this result.

Some of the PTs(%16,2) aren't able to prepare and use any scales. The PTs that are able to use more than 5 scales are only 36 percent. Modern teaching methods needs to take into consideration the individual differences. So, teachers are neccessary to use diagnostic scales. And the low level of using them by PTs indicates that they weren't able to define students enough as an educator.

The results indicate that PTs are able to use the teacher centered learning materials. This preference can arise from not ot b well educated about the constructivist learning materials such as cubes set, squares set, trensparent fraction bars.

According to the results, PTs from FE have a bigger self

efficacy than FS about using learning materials. This result can arise from the difference between the teaching ability of teaching stuffs.

The data obtained from the survey indicates that PTs thought to use mostly question banks and question papers. This result arise from the central examinations. The believe of passing central examinations thanks to special courses that are based to solving questions makes PTs to incite using question banks and question papers.

The most frequently chosen teaching method by PT was lecture method. This result indicates that PTs didn't think that they were not able to use constructivist approach's teaching method, yet. This can arise from the hardness of other methods. Also, being mathematicians more than mathematics teachers could make the sample to like keeping away from interactions with students. Thinking to be equal of being a mathematician and a mathematics teacher can cause this result. According to the table 10, PTs think that they were good at problem solving method. Mathematics courses are appropriate to solving problems and questions. But, this result may cause from misconception. Problem solving method needs applications and being original but on the other hand solving question can be applied with pencil and paper tests. This differences must be misconcepted by PTs may created this result.

According to faculties, PTs have a difference from each other. This differences seen on the methods needs more interaction such as question and answer method, storytelling method and team teaching.

There was difference between NL and DL PTs. This may cause from the teaching stuff differences of them. Senior teaching stuff mostly choose DL courses and this may cause being better DL than NL, according to some methods.

7. Suggestions

Perceiving universities as an entertainment center by students makes them to fail their educational goals. Passing central examinations is so hard that the students feel sluggish when they started to university. Then they look for new interests. During this lassitude period, teaching stuff may apply them vocational guidence on vocational information, SSC of mathematics and general culture. Teaching stuff explain to students what the news are and the subjects that need to be studied.

Not to love children is a big problematic for prospective students. Due to the importance of affective entry characteristics for courses, not to love children will make PTs one apice of mathematician. This isn't required for teaching training institues. Making the PTs to read books that describe the innerworld of children may help them to like children.

It was seen from the survey, 35.1 percent of the sample didn't know what SSC was. This is a high rate for PTs. This result indicates that universities aren't good at to succeed their goals as much as PTs. Monitoring the web sites of TNME, CHE, Measurement-Selection and Placement Center (MSPC) and The Scientific and Technological Research Council of Turkey (STRCT) that direct the educational events may help students to update their knowledge about education. Also, mentioning news at courses may also solve this problem.

Needs analysis is the most important step for developing curriculum. In this respect, needs analysis must be emphasized and explored the details by teaching stuff on Curriculum Development courses.

Also, the goals of all courses may be declared by teaching stuff to make students aware of the importance of the goals.

The result about using scales indicates that PTs don't attach importance to individual differences. This result may cause from the sample's own experiences. In this respect, preparing educational environments of PTs according to their individual differences may help them to aware of the importance of individual differences. Giving different homework types to different PTs and encourage them to participate different extra-curricular activities due to their abilities make help to solve this problematic.

Also, supplying feed backs to students about the questionnaires and scales and arranging courses according to results, may make PTs feel the usefulness of them.

Being not enough to use learning materials of PTs is the fault of teacher training institutes. All of the learning materials that can be used at mathematics courses must be introduced by teaching stuff to PTs. Also, using learning materials in courses at universities may also help PTs to perceive the importance of using materials.

The results about using the teaching method indicate that, PTs don't like to get interaction with students. But, as it emphasized before, being mathematics teacher needs to get interaction with students. PTs must review themselves and make a decision about their job. On the other hand, teaching stuff can cooperate PTs at courses. Group projects, team teaching, discussion, educational games, role playing may help the PTs to get socialized and may use them at their courses too.

Researchers that intend to study teacher-efficacy can investigate the teachers' efficacy level, what teachers need to be more efficient, what can be done to prepare PTs for more effective.

8. Discussions

The survey, that investigated the level of self-efficacy about the competence of planning and organizing instruction of PMTs in İnönü University, indicated that PTs weren't well enough about some performance indicators. The PTs have not to be able to reach to a lot of performance indicators, yet. Wrong preference about vocations and teaching activities at universities may cause this result. Vocational guidance must be held in Turkey and PTs must perceive the importance of interactions for teaching. Also universities may cooperate with TNME and STRCT to make PTs to be aware of news about education.

APPENDIX

Tables

Table 1. Characteristics of Sample

	N	%		N	%
Academic Success			**Interests**		
.....-59,49	4	3,6	Cinema	67	60,4
60-64,49	27	24,3	Music	61	55
65-69,49	34	28,7	Internet	55	49,5
70-74,49	25	22,5	Sports	51	45,9
75-79,49	14	11,6	Book	47	42,3
80-...	7	6,3	Science and Technology	45	40,5
Factors to Choose Being a Mathematics Teacher.			**Knowledge on Subject Specific Competencies of Mathematics**		
Loving Mathematics.	66	59,5	Yes	72	64,9
Prestige	27	24,3	No	39	35,1
Salary	21	18,9	Ways for Monitoring News		
Orientation of Family	18	16,2	Newspaper	62	55,9
Loving old Mathematics Teachers	9	8,1	Radio	7	6,3
Loving Children	8	7,2	Periodical	38	34,2
Orientation of Teachers	7	6,3	TV	59	53,2
Orientation of Friends	2	1,8	Internet	90	81,1
Faculty			None	3	2,7
Faculty of Education	45	40,5	**Learning Type**		
Faculty of Science	66	59,5	Normal	31	27,9
			Dual	80	72,1

REFERENCES

[1] Bandura, A., (1977). Self-Efficacy: Toward a unifying theory of behavioral change. Psychogical Review, 84(2)191-215

[2] Bandura, A. (1994). Self-efficacy, In V.S. Ramachaudran(Ed.), Encyclopedia of Human Behavior. (4), 71-81. Newyork: Academic Press.

[3] DPT, (2000). Yükseköğretim. Özel İhtisas Komisyonu Raporu: Sekizinci Beş Yıllık Kalkınma Planı, Public No. DPT:2534, Ankara.

[4] Enochs L. G., and Riggs, I. M., (1990). Further Development of an Elementary Science Teaching Efficacy Belief Instrument: A Preservice Elementary Scale, School Science and Mathematics, 90(8), 694-706

[5] Gibson, S., ve Dembo, M. H. (1984). Teacher efficacy: A construct validation. Journal of Educational Psychology, 76(4), 569-582.

[6] Gürkan, T., Duman, T., Güneysu, S., Yalın, H.İ., Olkun, S., Bıkmaz, F. vd. (2004). Öğretmen yeterliği taslağında yer alan yeterlik alanları. Bilim ve Aklın Aydınlığında Eğitim Dergisi, yıl 5, sayı 58.

[7] İlhan, A.Ç., (2004). 21. yüzyılda öğretmen yeterlikleri. Bilim ve Aklın Aydınlığında Eğitim Dergisi, yıl 5, s.58.

[8] MEB-ÖYEGM (2009). Ortaöğretim matematik öğretmeni özel alan yeterlikleri. 01.02.2010 tarihinde Öğretmen Yetiştirme ve Eğitimi Genel Müdürlüğü: http://otmg.meb.gov.tr/yet.pdf2/matematik07%5B1%5D.08.2009.pdf adresinden alındı.

[9] Özkan, Ö., Tekkaya, C., Çakıroğlu, J. (2002). Fen Bilgisi Aday Öğretmenlerin Fen Kavramlarını Anlama Düzeyleri. Fen Öğretimine Yönelik Tutum ve Öz-yeterlik İnançları, V. Fen Bilmleri Eğitimi Kongresi, ODTÜ, Ankara.

[10] Özkan,R., (2004). Öğretmen yeterlikleri üzerine bazı düşünceler. Bilim ve Aklın Aydınlığında Eğitim Dergisi, yıl 5, s.58

[11] Scholz, U., Dona, B.G., Sud, A., Schwarzer, R., (2002). Is general self-efficacy a universal construct?. European Journal of Psychological Assessment, 18 (3), 242-251.

[12] Seferoğlu, S.S., (2004). Öğretmen yeterlikleri ve mesleki gelişim. Bilim ve Aklın Aydınlığında Eğitim Dergisi, yıl 5, s.58

[13] Şahin, A.E., (2004). Öğretmen yeterliklerinin belirlenmesi. Bilim ve Aklın Aydınlığında Eğitim Dergisi, yıl 5, s.58

[14] Tschannen -Moran, M., Woolfolk-Hoy, A., ve Hoy, W. K., (1998). Teacher efficacy: Its meaning and measure. Review

of Educational Research, 68, 202-248.

[15] Yavuzer, Y., Koç, M. (2002). Eğitim Fakültesi Öğrencilerinin Öğretmen Yetkinlikleri Üzerinde Bir Değerlendirme. Niğde Üniversitesi Eğitim Fakültesi Dergisi. 1 (1), 35-43

[16] Yılmaz, M., Köseoğlu, P., Gerçek, C. ve Soran,H. (2004). Öğretmen öz-yeterlik inancı. Bilim ve Aklın Aydınlığında Eğitim Dergisi, yıl 5, s.58.

[17] Şeker, H., Deniz, S. & Görgen, İ. (2005). Prospective teachers' assessment of teacher competencies. Kuram ve Uygulamada Eğitim Yönetimi, 42, 237-253.

[18] Çakan, M. (2004). Comparison of elementary and secondary school teachers in terms of their assessment practices and perceptions toward their qualification levels. Ankara University, Journal of Faculty of Educational Sciences, 37 (2), 99-114.

[19] Kahyaoğlu, M. & Yangın, S. (2007). Views of prospective teachers in elementary school teaching departments about professional self-efficacy. Kastamonu Education Journal, 15 (1), 73-84.

[20] Azar, A. (2010). In-service and pre-service secondary science teachers' self-efficacy beliefs about teaching. ZKU Journal of Social Sciences, 6 (12), 235-252.

[21] Arslan, S. & Özpınar, İ. (2008). Teacher qualifications: Comparison between primary school curriculum expectations and teachers acquisitions in education faculties. Necatibey Faculty of Education Electronic Journal of Science and Mathematics Education, 2 (1), 38-63