The Usage Level of Time-Saving Measurement and Evaluation Techniques in Teacher Training Programs

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Abstract

The aim of this study is to explore the level of use of timesaving measurement and evaluation techniques in pre-service teacher training. The research is designed and conducted as a descriptive survey. 200 teacher candidates studying in seven different teacher education programs conveniently sampled from the education faculty located in the Mediterranean region of Turkey. The data was collected through the inventory developed by the researcher. The data analyzed with pairwise and multiple comparison techniques. The study revealed that the instructors at the education faculty were using time-saving measurement and evaluation techniques in their courses at a moderate level. These techniques were mostly used the by pre-school education, and least used in the department of mathematics education. The most commonly used time-saving measurement and evaluation technique in all teacher training programs was the Advantage/Disadvantage Listing Technique. The least-used technique was One Minute Paper Test. The prospective teachers' opinions did not differ according to their gender. Findings have been discussed in terms of teacher qualifications on the relative to current literature.

Keywords: time-saving measurement, evaluation techniques, pre-service teacher education

1. Introduction

Measurement and assessment are integral parts of education and training. The first goal of the assessment studies in education is to determine the needs of the students. The second goal is determining the success of students to ensure that they have progressed in their education and training. Through good measurement and evaluation, it is possible to remove the obstacles in front of education and training and to accomplish transitions between stages in the education system successfully.

Progress in the students' educational stages is usually measured by standardized tests. Without this activity, it is not possible to know which direction students will advance. Also, measurement and evaluation in education are very important for correct and effective decisions. They provide information needed in overall education planning. Decisions on instructional goals, units, grades, or marks enable teachers and school administrators to determine the extent to which pupils are growing towards the desired goals. Through measurement and evaluation, teachers can diagnose the strengths and weaknesses of pupils, and take steps for remedial action when needed. If effectively utilized, measurement and evaluation may lead to the improvement of both instruction and the learning situation. Without evaluation and measurement, it is impossible to know students' needs and preferences (Tshabalala & Ncube, 2014).

Constructivism is a theory that asserts that learning is an activity that is individual to the learner. This theory states that individuals will try to make sense of all information that they perceive, and that each individual will, therefore, "construct" their own meaning from the information. Constructivism represents one of the big ideas in education. Its implications for how teachers teach and learn to teach are enormous. To date, a focus on student-centered learning may well be the most important contribution of constructivism. The principles of constructivism, increasingly influential in the organization of classrooms and curricula in schools, can be applied to teaching and learning. The principles appeal to the modern views of learning and knowledge, but conflict with traditional practices. Teachers need to reflect on their practice to apply these ideas to their work. Constructivist teachers constantly assess how the activity is helping the students gain understanding. As a result, students who constantly question themselves and their strategies within the constructor class ideally become "expert students". This gives them ever-broadening tools to keep learning. With a well-planned classroom environment, the students "learn how to learn" (Bada & Olusegun, 2015).

Helping teachers to become more effective may mean both change in their assessment practice and change in their beliefs about learning. It will entail development of a critical awareness that change in one will, and should, inevitably lead to change in the other. So, implementing assessment for learning/formative assessment may require a teacher to rethink what effective learning is, and his or her role in bringing it about. Similarly, a change in their view of learning is likely to require assessment practice to be modified. While the focus is mainly on formative assessment, a good deal is relevant to classroom based summative assessment by which teachers summarizes what has been achieved at certain times (James, 2006).

In late twentieth century, student-centered approaches in teaching became more important, as the individual is a subjective phenomenon and knowledge is actively structured by the individual. This situation has also made alternative measurement and evaluation activities important in teaching processes. The facilitator role of the teacher in educational process has become more prominent. As a consequence, the implications of the educators on the evaluation concepts have begun to be seriously debated. Measuring and evaluating processes that nourish and develop learning and teaching with feedback have come to more effective positions. This change is reflected in the curricula of many developed countries. Since 2004, important steps have been taken in Turkey to develop teaching programs in this direction.

Classroom assessment and evaluation techniques are complementary. They are used to obtain feedback from the students, which allow immediate restructure of the instruction based on the feedback, and assessment of the effectiveness of the teaching. The techniques are student-centered and are beneficial both the teacher and the students. They provide a better learning environment and promote attendance of the learner in the classroom. They focus on learning and help to improve self-evaluation skills.

Classroom evaluation affects students in various ways. It guides their judgment of what is important to learn, affects their motivation and self-perceptions of competence, structures their approaches to and timing of personal study (e.g., spaced practice), consolidates learning, and affects the development of enduring learning strategies and skills. It appears to be one of the most potent forces influencing education (Crooks, 1988).

Teachers often use normative and non-normative types of assessment. It is also necessary that the learning techniques used are closely aligned with the teacher's supervisor. While exciting new developments emerge in our understanding of learning, there are simultaneous progressions in our measurement and evaluation systems. Timely saving in-class measurement and evaluation techniques should also be considered within this context.

These techniques are not used for grading. Class participation should be provided as much as possible in such measurement and evaluation studies. The views of the students should be appreciated and they should be able to express their true situation freely. Feedback should be given to the students. Conclusions should be shared with other teachers and the school management when necessary. These are the best known techniques: The [One Minute] Paper Test (OMPT), Preliminary Information [Background Knowledge Probe] Check List (PICL), Check List of Misconceptions (CLM), Memory Matrix Test (MMT), Categorizing Grid (CG), Self-Assessment Checklists (SAC), The One-Sentence Summary (OSS), Advantage/Disadvantage Listing Technique [Pro and Con Grid] (ADLT), Basic Rules Definition Technique [What is the Principle] (BRDT) and Application Cards Technique (ACT) (Bahar, Nartgün, Durmuş, & Bıçak, 2015, pp. 143-151).

The source of the new developments on evaluation and measurement in education should be education faculties which are the institutions where prospective teachers are trained. Within the broad scope of the subject, what is the usage level of time-saving measurement and evaluation techniques in teacher training programs? This is an important question that needs to be addressed.

2. Method

2.1 Research Model

The research is designed as descriptive survey study. Descriptive models are the kind of quantitative research and they tries to define existing situation.

2.2 Study Group

Research was conducted on the prospective teachers who are continuing to educational faculty located at a province on the Mediterranean region of Turkey. The study group of the research was defined by the convenience sampling method. The study group was consisted of 75 male (37.5%) and 125 (62.5%) female students (total 200) who were continuing seven different teacher training programs in education faculty. Participants of the research were (1) Department of Psychological Counseling and Guidance; (2) Department of Early Childhood Education; (3) Department of Classroom Teaching; (4) Department of English Teaching; (5) Department of Social Sciences Teaching (6) Department of Mathematics Teaching; (7) Department of Computer and Instructional Technologies.

All prospective teachers were voluntary for participating in the study.

2.3 Data Collection Instrument

The data of the study were collected with the help of an inventory developed by the researcher. The inventory is based on the techniques listed in the measurement and evaluation book written by Bahar et al. (2015) as "Time Saving Measurement and Evaluation Techniques". These techniques were named of: The One Minute Paper Test (OMPT), Preliminary Information Check List (PICL), Check List of Misconceptions (CLM), Memory Matrix Test (MMT), Categorizing Grid (CG), Self-Assessment Checklists (SAC), The One-Sentence Summary (OSS), Advantage/Disadvantage Listing Technique (ADLT), Basic Rules Definition Technique (BRDT) and Application Cards Technique (ACT).

It was aimed to define the using rate of these techniques by teaching staff in the educational faculty. The data collection tool has been reviewed by three experts in the field of measurement and evaluation in education. Ten items of inventory were piloted on a different group that did not enter the sample group. The reliability of inventory which computed based on Cronbach's alpha coefficient was .83.

2.4 Analysis

The data was analyzed according to the distribution characteristics of the data set. The arithmetic mean ($\overline{X}$), standard deviation (S.D), pairwise and multiple comparisons techniques were used in the analysis process. The normality of data was controlled with Shapiro-Wilk test. The Shapiro-Wilk's test results showed that there were no extreme values in the distribution and the normality assumption was provided [$p > .05$]. In the analyze process, the arithmetic mean and standard deviation formula was used to determine the levels of use of time-saving measurement and evaluation techniques according to the teacher's curriculum. "t" test for pairwise comparisons, and ANOVA (analyze of variance) for multiple comparisons were used. In evaluating prospective teacher candidates' views, the range values of the average scores were taken into account. The score ranges were interpreted as: 1.00-1.80 = Never; 1.81-2.60 = Sometimes; 2.61-3.40 = Middle; 3.41-4.20 = Mostly and 421-5.00 = Always.

3. Findings

The frequency and percentage of the teacher candidates in the study group according to gender and teacher programs are presented in Table 1.

Table 1. Distribution of participants in the study group

Options		1	2	3	4	5	6	7	Total
Gender		Female	Male	-	-	-	-	-	
	n	125	75	-	-	-	-	-	200
	%	62.5	37.5	-	-	-	-	-	100
Department		*Psy. Counseling and Guidance*	*Early Childhood Education*	*Classroom Teaching*	*English Teaching*	*Social Sciences Teaching*	*Mathematics Teaching*	*Computer and Inst. Technologies*	
	n	40	30	21	36	16	36	21	200
	%	20.0	15.0	10.5	18.0	8.0	18.0	10.5	100

As seen in Table 1, a total of 200 teacher candidates took part in the study group. 62.5 percent of the candidates are women, and 37.5 percent are male candidates. Students participated in the research through seven teacher training programs. There were 40 students from Department of Psychological Counseling and Guidance; 30 students from Department of Early Childhood Education; 21 students from Department of Classroom Teaching; 36 students from Department of English Teaching; 16 students from Department of Social Sciences Teaching; 36 students from Department of Mathematics Teaching and 21 students from Department of Computer and Instructional Technologies. The mean ($\overline{X}$) and standard deviation (SD) scores of the scores of evaluating teacher candidates evaluating the frequency of using Time-Saving Measurement and Evaluation Techniques in the education faculty and t test results based on gender are given in Table 2.

Table 2. T test results based on gender

	n	$\overline{X}$	S. D	t	p
Female	125	2.74	.75		
Male	75	2.85	.69	-1.072	.285
Total	200	2.78	.72		

As seen in Table 2, when the average of the opinions of the prospective teachers participating in the research on the frequency of use of time-saving classroom measurement and evaluation techniques in the lessons of the education faculty is found to be below the theoretical average with an arithmetic average of 2.78. This result shows that prospective teachers' mean score on time-saving measurement and evaluation techniques in courses are used at middle levels. In addition, there is no statistically significant difference between female and male teacher candidates' [t=-1.072, p> 0.05].

The descriptive statistics and ANOVA results based on 10 time-saving measurement and evaluation techniques according to the sections of the teacher candidates participating in the study and are given in Table 3.

Table 3. Descriptive statistics and ANOVA results based on different teaching training programs

Technique**	*Mean of Teacher training programs**								Differences among the groups			
	1	2	3	4	5	6	7	$\sum\overline{X}$	S.D	F	p	Diff.
OMPT	2.50	2.43	1.71	2.53	2.75	2.22	2.42	2.37	1.07	2.09	.055	-
PICL	2.70	2.43	2.05	2.72	2.86	2.39	2.86	2.57	1.03	1.99	.068	-
CLM	2.75	2.67	1.86	2.64	2.88	2.22	3.14	2.59	1.08	3.89	.001*	3-7
MMT	2.57	2.46	2.09	2.33	3.00	1.78	2.67	2.41	1.18	3.11	.006	-
CG	2.70	3.07	2.33	2.75	2.94	2.25	2.90	2.71	1.16	2.04	.061	-
SAC	2.83	3.67	3.05	3.08	2.88	2.81	2.76	3.01	1.17	2.23	.041	-
OSS	3.00	3.80	3.86	3.25	3.00	2.61	3.05	2.80	1.21	4.38	.000*	6-2; 6-3
ADLT	2.98	3.50	3.38	2.92	3.50	2.36	3.29	3.13	1.15	4.28	.000*	6-2
BRDT	2.70	3.63	3.19	2.89	3.38	2.61	3.48	3.12	1.17	3.81	.001*	6-2
ACT	2.85	3.30	3.29	2.72	3.44	2.17	3.29	3.01	1.23	4.41	.000*	6-2; 6-5
Total	2.46	3.10	2.68	2.78	3.06	2.34	2.99	2.77	0.72	-	-	-

Note. *p<0,05, (1) Department of Psychological Counseling and Guidance; (2) Department of Early Childhood Education; (3) Department of Classroom Teaching; (4) Department of English Teaching; (5) Department of Social Sciences Teaching (6) Department of Mathematics Teaching; (7) Department of Computer and Instructional Technologies. (OMPT) The *[One Minute]* Paper Test, (PICL) Preliminary Information Check List, (CLM) Check List of Misconceptions, (MMT) Memory Matrix Test, (CG) Categorizing Grid, (SAC) Self-Assessment Checklists; (OSS), The One-Sentence Summary; (ADLT) Advantage/Disadvantage Listing Technique *[Pro and Con Grid]*; (BRDT) Basic Rules Definition Technique *[What is the Principle]*; Application Cards Technique (ACT).

As seen in Table 3, when the total scores are taken into consideration, it is observed that time-saving classroom assessment and evaluation applications are mostly used in the Preschool Teaching Program with mean of 3.10. That is followed by the Department of Computer and Instructional Technology with a mean of 3.06 and Social Studies Teacher Department with a mean of 2.99. According to the findings obtained in the research, the time-saving classroom assessment and evaluation techniques are the least applied in Mathematics Teacher Education Program ($\overline{X}$ = 2.34). That is followed by the Department of Psychological Counseling and Guidance with the mean of 2.46 and the Teacher Education Program with the mean of 2.68.

When we look at these results in terms of time saving classroom measurement and evaluation techniques; the most commonly used technique is Advantage/Disadvantage Listing Technique [Pro and Con Grid] with 3.13. This is followed by (BRDT) Basic Rules Definition Technique [What is the Principle] with a mean of 3.12, which is followed by Application Cards Technique (ACT) with a mean of 3.01. According to prospective teachers, (OMPT) The [One Minute] Paper Test is the least-used time-saving measurement and evaluation technique 2.36 in the education faculty. This is followed by the MMT (Memory Matrix Test) with 2.41 and the PICL (Preliminary Information Check List) with a mean of 2.57. When we look at these results in terms of the differences between the groups; the ANOVA results show that there is a significant difference between groups based on averages of (CLM)

Check List of Misconceptions [F6,193=3.89 p<0.05], (OSS) The One-Sentence Summary [F6,193=4.38, p<0.05], (ADLT) Advantage/Disadvantage Listing Technique [F6,193=4.28, p<0.05], (BRDT) Basic Rules Definition Technique [F6,193=3.81, p<0.05] and (ACT) Application Cards Technique [F6,193=4.41,p <0.05]. Pairwise comparisons based on Scheffe test in Table 3 showed that students' view based on CLM technique is differing from each other in group 3 (Department of Classroom Teaching) and Group 7 (Department of Computer and Instructional Technologies) in favor of Group 7 (X̄=3.14). Pairwise comparisons also showed that Students' views about OSS technique statistically are differing from each other in groups 6-2 and in groups 6-3; the average of views in Group 6 are lower than Group 2 and group 3. Another pairwise comparison based on ADLT, BRDT and ACT techniques show that there is a statistically significant difference between groups 6-2 views and in all three techniques group 2 has lower mean than Group 6. Lastly, the views of students are also significantly differing from each other based on ACT technique in groups 6 and 5, in favor of Group 5.

4. Discussion

According to prospective teachers; the frequency mean of usage the time-saving classroom assessment and assessment techniques in the seven teacher training programs in the education faculty is 2.77. Time saving measurement and evaluation techniques are mostly used in department of preschool teacher training program (X̄=3.10) and the least in department of mathematics teacher training program (X̄=2.34). The most used classroom time-saving measurement and evaluation technique Advantage / Disadvantage Listing Technique [Pro and Con Grid] with a mean of 3.13; and the least is (OMPT) the One Minute Paper Test. The views of students are not statistically differing from each other based on gender variable. But views of students in seven teacher training programs are statistically differing from each other at four assessment techniques (CLM, OSS, ADLT, BRDT and ACT).

The overall finding obtained within the scope of the research is that the time-saving measurement and evaluation techniques are used at the moderate level (X̄=2.72) in the seven teacher education programs in the education faculty.

Alternative measurement and evaluation studies have a great influence in education and training. However, many researches on this subject reveal that there is an application problem on schools (Karaca, 2008; Birgün & Çatlıoğlu, 2009; Karamustafaoğlu, Çağlak, & Meşeci, 2012; Köklükaya, Kaplan, & Sevinç, 2014).

On the contrary, Tas, Çetinkaya, Karakaya, and Apaydın (2013) investigated the effectiveness of the alternative assessment and evaluation tool developed in science course on students. A web-based alternative measurement tool inspired by a recognizable branch tree was applied to 62 primary school students through an experimental research approach. As a result, it was determined that the achievement of the students in the experimental group had a statistically significant change compared to the control group students using the traditional teaching approach. The results of this research clearly demonstrate the importance of time-saving in-class assessment and evaluation techniques in teaching and learning as an alternative measurement and assessment tool.

The main purpose of classroom time-saving measurement and evaluation activities is not to evaluate the students but to improve the course. It can be seen as an important problem that the instructors use the time-consuming measurement and evaluation techniques in the moderate-level. This result may establish a link between Turkey and research conducted in other places. For example, in a study conducted by Gelbal and Kellecioğlu (2007) has been revealed that teachers prefer traditional methods of measurement, and they need training in the use and preparation of measurement techniques. In a study conducted by Alkin-Şahin et al. (2015), it was determined that the teachers did not apply to the subjects such as "evaluation and question writing with alternative methods and techniques used for assessment and evaluation". In the same study, it was also determined that the teachers had suggested that they would like to participate in the in-service training activities to be conducted in future on the measurement and evaluation. In a research conducted by Toptaş (2011), classroom teachers' perceptions about the use of alternative assessment and evaluation methods in mathematics courses were discussed. The findings of this study showed that teachers responded "sometimes" to the question "is it possible to present student products in the classroom?" In a research conducted by Çoruhlu, Er-Nas, and Çepni (2009), "emerge problems facing science and technology teachers use alternative measurement and assessment techniques in lessons". In the results of the research, it has been seen that teachers have started to use the new program with a little theoretical and practical knowledge about alternative assessment techniques and teachers. Teachers did not have enough proficiency about alternative assessment techniques and they started to adapt traditional techniques to the new program. Suggestions were made for the in-service education courses, including theoretical information and practical application for teachers.

In addition, a research conducted by Birgin and Gürbüz (2008), it aimed to determine the knowledge levels of the teachers about the measurement and evaluation of the class teacher candidates. Findings of the study indicate that

the majority of classroom teacher candidates tend to use tests with multiple-choice items and question-and-answer technique to determine the success and performance of students. As a result of the study, it was determined that the information about alternative assessment methods of the majority of the class teacher candidates was not proficient. For this reason, students should be given the opportunity to experience and implement alternative assessment methods in the course of their teaching to classroom teacher candidates.

In a study conducted by Adanalı and Doğanay (2010), "The measurement and evaluation activities and the problems that teachers face during the evaluation-evaluation process" were discussed. Findings showed that traditional measurement and evaluation methods have been used more frequently than alternative methods. In addition, the results showed that there is shortage of time and equipment and material deficiencies. A study by Şata (2016) examined how classroom and large-scale measurement and evaluation activities were conducted in the Turkish Education System. The results of the research show that the effectiveness of both in-class and large-scale measurement and evaluation activities is very low and therefore measurement and evaluation activities do not serve the purpose.

In these researches, teachers claim that they have to spend greater amounts of time in classroom evaluation activities than in standardized testing. Further, surveys of teachers and students have consistently indicated that they believe the educational and psychological effects of classroom evaluation are generally substantially greater than the corresponding effects of standardized testing (Dorr-Bremme & Herman, 1986; Haertel, 1986; Kellaghan et al., 1982; Salmon-Cox, 1981; Stiggins & Bridgeford, 1985). Therefore, the use of alternative assessment tools in education and training activities is very important, and the education system in Turkey shows that there are serious problems in the use of these tools. An important reason for this problem may be the low availability of using alternative measurement and assessment tools in the education faculties as the main finding of this research. These qualifications, which the prospective teachers cannot earn enough in the educational faculties, are reflected in the primary and secondary education institutions as a false heritage. The solution to this problem is to keep the use of alternative measurement and evaluation processes at the highest level in all teacher training programs in education faculties.

Another finding of this study was the use of classroom time-saving measurement and assessment techniques at the highest level in the department of preschool teacher training program. This result can also be seen as a validity indicator of this research. Because, the area where the alternative measurement and evaluation techniques should be used most is the preschool period.

At this point, it is suggested to attach special importance to alternative assessment and evaluation in the teacher training programs. The inadequacies in this issue can also be eliminated through courses.

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