Development of Prospective Teachers'
Conceptions of Assessment and Choices of
Assessment Tasks

Kemal Izci, Gurbuz Caliskan
Necmettin Erbakan University

To cite this article:

Development of Prospective Teachers' Conceptions of Assessment and Choices of Assessment Tasks

Kemal Izci, Gurbuz Caliskan

Article Info	Abstract
	Recent developments in students' assessment have required change in teachers' understanding and practices of assessment. Assessing student learning is an important skill that all teachers need to develop for effective teaching. However, it is a complex and difficult task to achieve because of the difficulties in changing teachers' traditional conceptions and practices related to assessment. Thus the study aims to investigate changes in prospective teachers' conceptions of assessment and their preference of assessment tasks after they completed an assessment course designed based on assessment for learning approach. The 'Teachers' Conceptions of Assessment Scale' developed by Brown (2008) was used as pre/post-tests and an additional task was employed to elicit participants' preference of assessment tasks. Data collected from 118 prospective teachers, data of 89 prospective teachers, who completely responded to data collection tool, were analyzed to present findings. Results indicated that teachers' conceptions of assessment (school accountability, student accountability, improvement and irrelevance) did not significantly change while teachers' choices of assessment tasks significantly changed towards more use of alternative assessment tasks. The results showed that changing teachers' conceptions of assessment is complex and requires considering other factors such as experience and culture. The results also showed that assessment courses that were organized around assessment for learning approach encourage prospective teachers to choose and use more alternative assessment tasks.

Introduction

Based on the paradigm shift from behaviorist to constructivist and social learning approach, our understandings of effective teaching and learning have been evolved. Now, current conceptualization of learning requires that new knowledge should be constructed on existing knowledge, which significantly impacts how learners develop new concepts. Therefore, it has been advocated that classroom assessment, as a part of teaching process, must be changed in a way to support that kind of learning (Abell & Siegel, 2011; Shepard, 2000). In order to aid that kind of learning, Shepard (2000) claimed that both the content and types of assessment and also teachers' use of assessment should be changed. This change is called formative assessment or assessment for learning. Formative assessment, as described by Black and Wiliam (1998) refers to "all those activities undertaken by teachers, and by their students in assessing themselves, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged. Such assessment becomes 'formative assessment' when the evidence is actually used to adapt the teaching work to meet the needs" (Black & Wiliam 1998, p. 2). There have been extensive attempts to change the content and types of assessment tasks to assess and support desired learning (e.g., Furtak, 2012; Heitink et. al., 2016). However, without changing teachers' understanding and practices of assessment, it is difficult to engage them in formative assessment practices to support student learning.

Teachers spend almost one-third of their instructional time for assessment related activities; however, because of inappropriate understanding and use, they do not get benefits of assessment for learning and teaching (Stiggins, 2007). Researchers have shown that formative uses of assessment improve learning and motivate students to engage in learning to become self-directed learners (Black & Wiliam, 1998; Heritage, 2007). Without addressing how teachers understand and practice assessment, it is difficult to motivate teachers to practice assessment to support learning. According to Black and William (2009), there are five key points that teachers should accomplish to support learning through assessment. They are: (a) providing clear learning goals and expectations; (b) collecting evidences of student learning via formal and informal tasks; (c) providing supportive feedback; (d) supporting collaboration during assessment process; and (e) engaging students in self-assessment

to be responsible for their own learning. Successfully addressing these key points is seen crucial for supporting learning, as well as, teachers are required to be assessment literate in order to achieve these key points (Black & William, 2009; Abell & Siegel, 2011)

In the relevant literature, teachers' knowledge and skills for practicing assessment to aid learning is known assessment literacy (Abell & Siegel, 2011) or assessment expertise (Lyon, 2013). It has been shown that teachers' beliefs, perceptions and conceptions of assessment strongly impact and mediate their assessment practices. Teachers' conceptions of learning, teaching and assessment influence how they behave in their classrooms. Conception is known as the values people develop via their experiences and use to evaluate the other constructs such as actions of other people or an activity (Eggen & Kauchak, 2001). Thus, teachers' conceptions of assessment are an important construct for teachers' assessment practices. However, research has shown that even if teachers hold positive views of assessment and perceive the benefits of assessment for themselves and for their students, they mostly struggle to transfer their views into classroom practices (Heitink et. al., 2016). Even the tension between conception and practice of assessment is much more complex and difficult for prospective teachers (Siegel & Whisher, 2011; Otera, 2006; Volante & Fazio, 2007). Hence, preparing teachers to perceive benefits of assessment for learning and then practice assessment in a way to support learning will be a meaningful way to support prospective teachers' assessment literacy.

Studies have shown that changing teachers' traditional conceptions of assessment is hard and even if teachers understand benefits of modern assessment practices, they choose to use traditional assessment practices during their instruction (Heritage, 2007). One of the main reasons for this is that teachers have more practical experiences with traditional assessment practices as students and as teachers and they lack experiences in successful assessment practices. Also, assessment related courses they took and their assessment experiences during teacher training influence their understanding and practices of modern assessment (Siegel & Wissehr, 2011; Otera, 2006). Research has shown that pre-service teacher education, in particular, is the cornerstone of changing teachers' traditional conception of classroom assessment (Siegel & Wissehr, 2011). Thus, this study aims to explore the changes in prospective teachers' conceptions of assessment and the assessment tasks they want to use after they have completed an assessment course that was designed based on the assessment for learning approach.

Conceptual Framework

Teachers' decision making about assessment is affected by teachers' conceptions of assessment (McMillan, 2003), which impacts their adoption of assessment for learning (Black & Wiliam, 1998; McMillan 2003; Remesal, 2007). Teachers' conceptions of assessment have been defined in four aspects: "a) assessment's role in learning; b) assessment's role in teaching; c) assessment's role in the certification of learning; and d) assessment's role in the accountability of learners' achievement" (Remesal, 2007, p. 31). The first two conceptions are related to the notion assessment for learning and the last two are aligned with the notion assessment of learning. Brown (2008) further elaborated on these four aspects and emphasized four types of conceptions that teachers mostly hold. They are student accountability, school accountability, improvement and irrelevance. The student accountability conception focuses on the consideration of assessment as a way to differentiate students' levels of learning to make decisions about getting them into next grade level within the sequence of schooling. The school accountability considers the function of assessment to evaluate effectiveness of school, teachers and curriculum by using high stake testing and national assessment processes. The improvement conception focuses on the role of assessment in eliciting, monitoring and supporting student learning. Improvement conception is also known as assessment for learning or formative assessment in the literature and assigns new roles to teachers and students in the assessment process for the aim of supporting teaching and learning. It is also important that teachers should be knowledgeable about different types of assessment and use appropriate assessment tasks to assess and improve desired learning. The irrelevance conception regards assessment as unbeneficial process, so it supports disregarding assessment within the learning and teaching process. The current study has been constructed based on the four types of teachers' conceptions offered by Brown (2008).

Research Questions

Turkey's Ministry of National Education (MoNE) has recently been attempting to integrate assessment for learning conceptions into its reformed curriculum. This conception is highlighted within the national curriculum and requires teachers "To use assessment in a way to monitor, guide, diagnose learning difficulties and support

meaningful and permanent learning of students throughout the teaching process. In order to achieve that, teachers should employ much more formative assessment tasks than traditional tasks." (MoNE, 2013, 4) Nevertheless, in order to transfer the expectations of the curriculum into the classroom, we should prepare teachers to conceive and use assessment in the desired way. Thus, this study proposes to show the impact of an assessment course that was constructed based on the assessment for learning approach on prospective teachers' conceptions of assessment and choices of assessment tasks. The details of the assessment course are provided under the 'Context of the Study' title. The research questions guiding the study were:

RQ1. Is there any difference between prospective teachers' conceptions of assessment after attending an 'Assessment and Evaluation in Education' course based on their pre/post-test scores?

RQ2. Is there any difference between the male and female prospective teachers' conceptions of assessment after attending an 'Assessment and Evaluation in Education' course based on their pre/post-test scores?

RQ3. Is there any difference between prospective teachers' choices of assessment tasks after attending an 'Assessment and Evaluation in Education' course based on their pre/post-test scores?

Methods

Action research was employed as the research method of this study, since the ultimate purpose of our research was to improve our practice. Smith (2007) explains that action research aims to improve personal practice, especially in educational fields. Action research is a way for researchers and teachers to analyze, assess, and improve their own practices (McNiff & Whitehead, 2006). One of the differences of action research is that the people who develop and implement the research can be both researchers and participants of the study (Erözkan, 2007). The aim of action research is not providing generalizations for research results because context is important during the process (Norton, 2009). According to Norton, action research follows a spiral cycle and includes the following general steps;

> 1) Identification and definition of the problem,
> 2) Development of an action plan for solving the problem,
> 3) Implementation of the action plan,
> 4) Evaluation of the action plan implementation process and its outputs.

Subjective or objective perspectives can be found in the epistemological background of studies using action research methodology (Norton, 2009). Researchers can ask questions such as 'What am I doing?, What do I need to improve my practice?, and How can I improve it?' to guide their efforts for improving their own practices (McNiff & Whitehead, 2006). The researchers of the study aimed to develop their practices and asked similar questions to evaluate and improve their teaching practices. Convenience sampling is a common method for defining samples for action research and used in the study. Both quantitative and qualitative data can be collected in action research based on research questions (Greenwood & Levin, 2007). One of the quantitative research approaches, namely one group pre/post-test design, was employed in order to achieve the aim of the study.

Participants

The participants of the study were 118 prospective teachers studying at a university located in Central Turkey. The prospective teachers were studying in the departments of Computer and Instructional Technologies (48), Middle School Mathematics (35) and Turkish Language Teaching (35). 46 of the participants were male, while 72 of them were female. However, even if 118 prospective teachers took the survey, 89 of them completely answered the survey questions. Thus the study used 89 prospective teachers' responses to the survey as data sources and eliminated others. Since the study took place during the 'Assessment and Evaluation in Education' course, the prospective teachers who were taking the course participated in the study. The course is offered in the fourth semester to the department of Computer and Instructional Technologies, while the prospective teachers from the departments of Middle School Mathematics and Turkish Language Teaching take the course in their sixth semester. Thus, the participants were limited by the prospective teachers in their fourth and sixth semester, respectively.

Context of the Study

One of the required courses for prospective teachers in Turkey is 'Assessment and Evaluation in Education'. Data collection process took place within the course while the prospective teachers were attending the course. The course was designed around the notion of assessment for learning in order to aid prospective teachers in understanding assessment because it is an important part of learning and thus they need to practice assessment to support learning in addition to just assessing learning. The course took 14 weeks during the spring semester of 2015-2016 school years.

The content of the course includes traditional assessment related concepts consisting of essential terms such as dependent and independent variables used in assessment, reliability, validity, statistical measures employed for interpreting test results and properties of different assessment tasks such as multiple-choice items, open-ended or close-ended paper-pencil tests and concept maps. In addition, the course consists of some important concepts that guide prospective teachers to think about and use assessment to aid learning. These contents were alternative assessment methods, ways to diagnose students' misconceptions and difficulties, interpretation of assessment results and ways to use them to support learning and providing equitable assessment opportunities for all learners. To achieve the highlighted concepts of assessment for learning, during the course, the prospective teachers were required to complete three different projects and write weekly journals on the course website.

The first project asked prospective teachers to 1) choose a content unit based on their field of teaching, 2) find misconceptions related to the unit from literature, 3) design an assessment task to identify these misconceptions, 4) employ the tasks on at list five targeted students and 5) check if students held any of the misconceptions. In the second project, prospective teachers were provided with five students' responses, which cognitively presents varying levels of understanding, to two open-ended questions based on their field and asked to analyze the students' responses in order to 1) see if they understood the targeted concepts, 2) sequence students from low to high based on their understandings and 3) offer pedagogical ways for how to help low level students to develop the concepts. The third project required students to choose a content unit and develop unit plans for at least three hours' teaching by integrating at least four different assessment tasks, indicating their purposes for using them and develop a scoring rubric a least for one of the open-ended assessment tasks. The projects and students' weekly journals formed 50% of their final grades.

Data Collection Tool

The 'Teachers 'Conceptions of Assessment Scale', which was developed by Brown (2008) was used to gain quantitative data about the participants' conceptions of assessment. The original scale includes 27 items and lets participants show their choice on a 6-point Likert-scale format. In the study, the Turkish version of the scale, which consists of 25 items and was adapted for Turkish users by Vardar (2010), was used to collect the data. The scale consists of three parts. The first part asks for personal information; the second part lists 18 different assessment tasks and asks for participants' willingness to use each of them in their instruction; the third part includes 25 items that measure participants' conceptions of assessment for four different sub-scales.

There are three items for student accountability, three items for school accountability, seven items for irrelevance and twelve items for improvement sub-scales. Based on 414 preservice teachers participated in Vardar's (2010) study, Cronbach's Alpha was calculated for reliability of whole scale (Cronbach Alpha= 0.84) and sub-scales (Cronbach Alpha= 0.72; 0.74; 0.86; 0.87). Confirmatory factor analysis was used to see the factors structure of the scale. In order to see the fitness of the model, chi-squared statistic ($\chi2/df$), Root Mean Square Error of Approximation (RMSEA), Normed Fit Index (NFI) and Comparative Fit Index (CFI) measures were used. The results for confirmatory factor analysis reported by Vardar (2010) showed reasonable fit characteristics with overall data (N=414, $\chi2$= 695.36, df= 269, p=.00, RMSEA=.064, CFI=.94, NNFI=.93).

The scale was used as pre/post-test respectively at the beginning and at the end of the semester the participants took the 'Assessment and Evaluation in Education' course. While 118 participants took the course, the data gained form 89 participants who completely responded to the scale was used to present results. Furthermore, the study only focused on the prospective teachers who attended the course delivered by the first author of the study. Thus one of the limitations of the study was the low level response rate of the participants. However, since the study used a pre/post-test research design, as Demirbaş (2016) indicated, data of 89 participants can be seen an appropriate number to answer the research questions of the study.

Data Analysis

SPSS 20.0 package program was employed to analyze the collected data. In order to determine appropriate statistical techniques, whether the data show a normal distribution or not was examined. For examination of normality, Kolmogorov-Smirnov test was used. The results of Kolmogorov-Smirnov test showed that two of the sub-scales, namely school accountability (s: .099 and p: .097) and improvement (s: .099 and p: .098) showed a normal distribution while two of the other sub-scales, student accountability (s: .125 and p: .011) and irrelevance (s: .109 and p: .046) did not show a normal distribution as p<.05. However, when we looked at the values of skewness and kurtosis for student accountability (-.197 and .038) and irrelevance (.440 and -.602) sub-scales, they were between the limits of -1 and +1, which indicated that the scores obtained from the sub-dimensions exhibited a normal distribution (Huck, 2012). Thus, in order to answer the research questions of the study, Independent Samples t Test was used to explore whether there was any difference between participants' pre/post-test scores for the conceptions of assessment. Two-Way ANOVA was also used to explore whether there was any difference between male and female prospective teachers' conceptions of assessment. Furthermore, descriptive measures were employed to analyze the change in participants' choices of assessment tasks. For reliability, Cronbach's Alpha was re-calculated for each of the four conceptions construct for this study and the results can be seen at Table 1.

Table 1. Reliability coefficient values of the scale

Sub-scales	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Student accountability	.690	.690	3
School accountability	.704	.708	3
Improvement	.793	.789	7
Irrelevance	.947	.947	12
Total	.818	.818	25

Findings

The results of the study showed that only the change in the irrelevance conception was statistically significant based on the pretest and posttest scores while there were changes in the mean scores of the other three conceptions. The results also demonstrated that there was not a statistically significant difference concerning the conceptions of assessment based on the gender of prospective teachers. On the other hand, the results showed that the participants were more inclined to use assessment tasks (e.g., open-ended questions, portfolio, concept map) that focus on conceptual learning and less inclined to use assessment tasks (e.g., multiple-choice items, fill in the blank type questions) that focus on memorization and surface learning.

Conceptions of Assessment

Table 2 shows the average scores prospective teachers earned from each of the conceptions of assessment addressed in the scale. Based on the average scores of pretest and posttest, it is seen that while school accountability, irrelevance and improvement conceptions of participants increased after they attended the course, the student accountability conception decreased.

Table 2. Descriptive statistics based on the pre/post-test scores

	N	Student Accountability	School Accountability	Irrelevance	Improvement
Pretest	89	4.85	4.16	2.14	5.03
Posttest	89	4.76	4.26	2.45	5.04

In order to explore if the changes in participants' conceptions of assessment were statistically significant for our first research question, we calculated t-test scores. As seen in Table 3, just the change in the irrelevance conception was found to be significant while the changes in the other conceptions were not statistically significant.

In order to answer our second research question, which aimed to explore if there was a gender difference concerning the prospective teachers' conceptions of assessment, we calculated descriptive statistics and Two-way ANOVA.

Table 3. Results of the t-test for the changes in participants' conceptions of assessment

Student Accountability		N	X	Sd	t	p
	Pretest	89	14.55	1.93	.671	.505
	Posttest	89	14.28	3.03		
School Accountability		N	X	Sd	t	p
	Pretest	89	12.49	3.25	-.528	.599
	Posttest	89	12.78	3.13		
Irrelevance		N	X	Sd	t	p
	Pretest	89	14.98	5.43	-2.433	.018*
	Posttest	89	17.14	6.99		
Improvement		N	X	Sd	t	p
	Pretest	87	60.39	7.61	-.079	.938
	Posttest	87	60.49	10.16		

*: $p<0.05$

When we look at the descriptive statistics, it is seen that the scores of female prospective teachers for student accountability, school accountability and improvement decreased after they attended the course while their scores for irrelevance increased. On the other hand, regarding the male prospective teachers, while the conceptions of school accountability, irrelevance and improvement increased, the student accountability conception decreased after they attended to the course.

Table 4. Descriptive Statistics based on the gender variable for participants' conceptions of assessment

		Student Accountability			School Accountability			Irrelevance			Improvement		
	Gender	N	X	Sd	N	X	Sd	N	X	Sd	N	X	Sd
Pretest	Female	42	14.64	2.06	44	12.70	3.09	43	14.23	5.17	40	62.15	5.89
	Male	23	14.39	1.70	23	12.09	3.57	20	16.60	5.76	21	57.05	9.39
	Total	65	14.55	1.93	67	12.49	3.25	63	14.98	5.43	61	60.39	7.61
Posttest	Female	42	14.31	3.06	44	12.59	3.33	43	16.63	6.78	40	61.15	10.82
	Male	23	14.22	3.06	23	13.13	2.74	20	18.25	7.50	21	59.23	8.88
	Total	65	14.28	3.03	67	12.78	3.13	63	17.14	6.99	61	60.49	10.16

In order to explore whether the gender variable was significant or not, we used Two-way ANOVA as seen in Table 5. Based on the ANOVA results, it was found that gender was not a significant factor that influenced prospective teachers' conceptions of assessment.

Table 5. Two-way ANOVA results for gender variable

Student Accountability	Sum of squares	df	Mean of squares	F	p
	1.912	1	.189	.340	.562
School Accountability	Sum of squares	df	Mean of squares	F	p
	10.112	1	.677	1.049	.310
Irrelevance	Sum of squares	df	Mean of squares	F	p
	3.792	1	4.443	.151	.699
Improvement	Sum of squares	df	Mean of squares	F	p
	70.086	1	1.476	.205	.229

Choice of Assessment Tasks

In order to investigate the differences between prospective teachers' assessment choices before and after their attendance to the assessment course, we utilized the second part of the 'Teachers' Conceptions of Assessment Scale'. The second part of the scale consists of 18 different assessment tasks and we asked teachers to select those that they wanted to use in their teaching. The prompt also allowed participants to write the assessment tasks that they wanted to use if they were not listed. Table 6 shows the frequencies and percentages of each of

the assessment tasks that prospective teachers indicated they wanted to use before and after the course. The results show that after attending the course, prospective teachers much more wanted to use assessment tasks that focus on conceptual learning as their choices of the open-ended questions, portfolio, peer-assessment, constructed grid, concept maps and rubric increased more than 100 percent. In addition, prospective teachers' assessment choices also increased concerning close-ended, fill-in-the-blank and multiple-choice questions, projects, performance tasks, self-assessment and group work for more than 10 percent while their choices of true/false questions, presentation and drama increased less than 10 percent. Besides, prospective teachers' choice of matching types questions did not change while their choice of observation form decreased 52 percent.

Table 6. Differences between participants' choices of assessment tasks before and after the course

Tasks	Pretest (f)	%	Posttest (f)	%	Change (%)
Open-ended written	14	2.83	50	7.18	257
Close-ended written	25	5.05	30	4.31	20
Fill-in-the-blank	52	10.51	60	8.62	15
Multiple-choice	72	14.55	86	12.36	19
True/False	45	9.09	48	6.90	7
Matching	45	9.09	45	6.47	0
Presentation	26	5.25	27	3.88	4
Oral exam	16	3.23	26	3.74	62.5
Drama	14	2.83	15	2.16	7
Project	33	6.67	47	6.75	42
Performance tasks	30	6.06	43	6.18	43
Portfolio	8	1.62	42	6.03	425
Peer-assessment	14	2.83	28	4.02	100
Self-assessment	26	5.25	32	4.60	23
Group work	38	7.68	42	6.03	10.5
Observation form	21	4.24	10	1.44	-52
Constructed Grid	2	0.40	25	3.59	1150
Rubric	12	2.42	35	5.03	191.5
Others (e.g., concept map)	2	0.40	5	0.72	150
Total choices	495	100	696	100%	

Discussion

The aim of the study, based on action research method, was to explore the influence of 'Assessment and Evaluation in Education' on prospective teachers' conceptions of assessment and assessment choices. The results showed that after taking the course, only prospective teachers' irrelevance conception of assessment increased significantly while the increases in school accountability and improvement conceptions were not significant. Furthermore, prospective teachers' assessment choices mostly changed after they attended the course as they mostly tended to use more open-ended assessment tasks to assess and support conceptual learning. The results of the action research study showed that engaging prospective teachers into more assessment related practices via different projects did not significantly improve participants' conceptions of assessment as we researchers want. On the other hand, making prospective teachers engage in more assessment related practices such as developing assessment tasks, interpreting assessment results, and preparing assessment-centered lesson plans may let participants to see the details of assessment process that makes them to feel uncomfortable and see assessment as irrelevant activity for students. The details of the findings based on the related literature will be discussed below.

Changing teachers' conceptions of assessment is difficult because the process is complex and it is influenced by prior experience, knowledge and personal beliefs about assessment (Taber et. al., 2011). While the notion of assessment for learning is promoted by educators as it is shown to contribute to student learning, teachers are faced with difficulties to understand and practice assessment in the desired way because of the nature of the testing culture. Prospective teachers have more experience in high-stake testing in Turkey since they should take high-stake testing to attend a high school, a university and even a profession. Thus, even if they believe assessment for learning is valuable for them and their students, in reality the high-stake testing culture promotes accountability of school and student conceptions (Levy-Vered & Alhija, 2015; Taber et. al., 2011). Therefore,

prospective teachers are confused about the purposes and practices of assessment because of the conflicting situation between their training and the real life practice of assessment. This conflict is supported by the findings of our study, too as the findings showed that even if teachers attended an assessment course and gained detailed knowledge of assessment, their conceptions of assessment, except irrelevance conception, did not change. Similar studies also found that attending an assessment course or having more training in assessment did not improve teachers' conceptions of assessment (Brown, 2008; Levy-Vered & Alhija, 2015). However, there are studies that showed that teachers' conceptions of assessment are associated with their knowledge of assessment and after getting training for assessment, prospective teachers' conceptions of assessment developed (e.g., DeLuca, Chavez & Cao, 2013; Smith, Hill, Cowie, & Gilmore, 2014). Interestingly, the finding of the study also showed that after teachers attended the course, prospective teachers did not conceive assessment as beneficial as their irrelevance conception improved significantly. As researchers have stated, one of the reason for this is that, when teachers learn more about the complexities and challenges related to developing and integrating assessment into their teaching, their confidence in assessment may decrease and ultimately they regard assessment as a useless activity (DeLuca and Klinger 2010). Furthermore, even after getting training, based on the strong high-stake testing culture, prospective teachers think that assessment does not contribute to learning and teaching process and so it is not useful (Izci & Şardağ, 2016).

While the findings did not show significant change in prospective teachers' conceptions of assessment other than in the irrelevance conception, prospective teachers' student accountability, school accountability and improvement conceptions were high both in their pre-test and post-test (see Table 2). We found that prospective teachers' student average scores of accountability conceptions were 4.85 and 4.76 for pre and posttest and that means they mostly understood assessment as a way to make students accountable for their own learning. Similar results were found by other studies conducted in Turkey (Izci & Şardağ, 2016; Karaman & Şahin, 2014; Vardar, 2010) and in other countries (Brown, 2002; 2008). Even if the decrease in the student accountability conception was not found to be significant, it tended to be inclined after the course. The result means that prospective teachers still conceive assessment as a way to make students responsible for their own learning. One of the reasons for this can be the prospective teachers' experiences with high-stake testing culture in Turkey since students have to take high-stake national and regional tests to pass a class or attend a high school or a university in Turkey (Izci & Şardağ, 2016). In terms of school accountability, the study found that prospective teachers' average scores were 4.16 and 4.26 for pre and posttest. The results showed that prospective teachers more believe that assessment makes school responsible and shows school success. This finding is parallel with what Izci and Şardağ (2016), Karaman and Sahin (2014) and Vardar (2010) found as their average scores were 4.33, 4.11 and 3.68, which mean that prospective teachers think that assessment makes school and teacher accountable for student learning. For the improvement conception, the results showed that prospective teachers both prior to and after the instruction highly valued the role of assessment in improving learning and teaching as their pre and posttest scores were 5, 03 and 5, 04. Other studies also found that teachers' improvement conception is higher than other conceptions (Izci & Şardağ, 2016; Karaman & Şahin, 2014). Yet, Vardar (2010) found that the improvement conception comes after the student accountability conception in her study. When we compare the results with regard to the improvement conception, we can conclude that the participants of the study more conceive the improvement conception than other studies conducted in Turkey since the average scores gained form the same scale for Izci and Şardag (2016) was 4.71, for Karaman and Şahin (2014) were 4.08 and for Vardar (2010) were 4.70. In terms of the irrelevance conception, the study showed that after attending the assessment training, prospective teachers more viewed assessment as an unnecessary process. As we discussed above, one reason for this can be the complex nature of assessment course that makes students feel uncomfortable and as a result they view assessment as useless. The pre and posttest scores were 2.14 and 2.45 and they are lower than the results of other similar studies for the irrelevance conception. For example, Vardar (2010) found average scores for the irrelevance conception to be 3.88; Karaman and Sahin (2014) found it 2.85 and Izcı and Sardag (2016) found it 3.08. Thus even if the participants' irrelevance conception improved, they were still lower than the findings of the other studies, which may mean the participants less conceive assessment as needless than others. However, teachers' negative thinking regarding assessment is important since it influences their practices. Therefore, researchers need to find ways to show to teachers benefits of assessment for learning and teaching in order to change their conception of irrelevance for assessment.

On the other hand, the results of the study showed that prospective teachers decided to use more open-ended assessment tasks including open-ended questions, performance tasks, rubrics, constructed grids and portfolios to assess their students after attending the assessment course (see Table 6). Similar findings were found by McGee and Colby (2014) and Siegel and Wisher (2011) as they explored the impact of assessment course on prospective teachers' assessment literacy. However, Vardar (2010) found that practicing teachers more tended to use close-ended assessments such as multiple-choice and matching type assessment while less wanted to use open-ended assessments such constructed grid, rubric and performance task. Based on our current understanding

of assessment, more open-ended assessment tasks should be used to elicit and assist student learning throughout instruction, as opposed to traditional assessment such as tests, which are administered at certain times and not able to elicit students' conceptual understanding. More open-ended tasks and fewer closed-ended tests will support students' reasoning, problem solving, and critical thinking abilities and promote application of knowledge into real life practices. These kinds of assessments should be used during teaching to focus on learning, as opposed to their being used at the end of instruction. They should include various strategies such as observations, reflective journals, oral presentations, projects, and portfolios to provide formal and informal assessment opportunities to assess and improve students' learning (Abell & Siegel, 2011; Black & Wiliam, 2009). The use of various assessment strategies that produce qualitative and quantitative data is very important because it ensures fairness of measurement and supports robust learning (Lyon, 2013; Izci, 2013; Siegel & Wisher, 2011).

Recommendations

The results of the study have important suggestions for teacher educators about how to support prospective teachers to be successful in their future careers. Firstly, the results of the study showed that only training teachers to enhance their knowledge of assessment is not adequate for changing prospective teachers' conceptions of assessment. As Fives and Buehl (2012) indicated, changing teachers' views about assessment is complex, multilayered and varied. Moreover, teachers' conceptions of assessment are shaped by their experiences and the contexts in which they teach or are taught and therefore it depends on their cultures. In order to change teachers' traditional conceptions of assessment, the culture of school should be changed to support desired conceptions of assessment. Otherwise, teachers will be faced with difficulties and have conflicting ideas of assessment because of the difference between what they are requested to do and what they are experienced within the real instructional practices (Xu & Brown, 2016).

One of the ways to change prospective teachers' traditional conceptions of assessment is to provide opportunities for seeing and experiencing the benefits of assessment with regard to the learning approach. If prospective teachers experience successful assessment practices and see the positive outcomes for their students and for themselves, they will be more believing in the important role of assessment in learning and will be more wanting to use assessment for learning. Therefore, as teacher educators, we first should employ more assessments in our classes for learning to provide successful assessment experiences for prospective teachers and second guide teachers to engage in and practice assessment for learning during their field teaching practices.

In order for assessment to support learning, teachers should employ quality assessment to elicit, assess and support students' conceptual understanding. However, close-ended questions including multiple-choice, matching and fill-in-the-blank are not capable of eliciting and assessing deeper understanding. Hence, prospective teachers should be informed about the advantages and disadvantages of different assessment tasks and based on their aims of assessment they should choose and use appropriate tasks to make instructional decisions in a way to aid student learning. This process can be supported by teacher educators if they use different assessments in their instruction because teachers can model them for transferring them into their teaching.

Notes

This study was presented at a symposium entitled International Conference in Research on Education and Science (ICRES) organized on 19-22 May 2016 in Muğla. Its abstract was also published in the proceedings book.

References

Abell, S. K., & Siegel, M. A. (2011). Assessment literacy: What science teachers need to know and be able to do? In D. Corrigan, J. Dillon, & R. Gunstone (Eds.), *The professional knowledge base of science teaching* (pp. 205–221). The Netherlands: Springer.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education, 5*(1), 7-74.

Black, P., & Wiliam, D. (2009). Developing a theory of formative assessment. *Educational Assessment, Evaluation and Accountability, 21*(1), 5-31.

Brown, G. T. L. (2004). Teachers' conceptions of assessment: implications for policy and professional development. *Assessment in Education, 11(3), 301-318.*

Brown, G. T. L., & Hirschfeld, G. H. F. (2008). Students' conceptions of assessment: Links to outcomes. *Assessment in Education: Principles, Policy & Practice, 15* (1), 3-17. doi:10.1080/09695940701876003

DeLuca, C., Chavez, T. & Cao, C. (2013). Establishing a foundation for valid teacher judgment on student learning: The role of pre-service assessment education. *Assessment in Education: Principles, Policy & Practice, 20*(1), 107-126

Demirbaş, M. (2016). Bilimsel araştırma ve özellikleri. Kuramdan uygulamaya: Eğitimde bilimsel araştırma yöntemleri kitabı içerisinde 1. Bölüm (s. 3-19). Pegem Akademi. Eggen, P. D., & Kauchak, D. P. (2001). *Strategies for teachers: Teaching content and thinking skills*. Boston: Allyn & Bacon.

Erözkan, A. (2007). Bilimsel Araştırmalarda Yöntemler., D.Ekiz (Editör). Bilimsel Araştırma Yöntemleri. İstanbul: Lisan Yayıncılık.

Fives, H., & Buehl, M. M. (2012). Spring cleaning for the "messy" construct of teachers' beliefs: What are they? Which have been examined? What can they tell us? In K. R. Harris, S. Graham, & T. Urdan (Eds.), *APA educational psychology handbook: Individual differences and cultural and contextual factors* (Vol. 2, pp. 471–499). Washington, DC: American Psychological Association.

Greenwood, D.J., & Levin, M. (2007). *Introduction to action research: Social research for social change.* Thousand Oaks, London: Sage Publications.

Lyon, E. G. (2013). Learning to assess science in linguistically diverse classrooms: Tracking growth in secondary science preservice teachers' assessment expertise. *Science Education, 97*(3), 442-467 doi:10.1002/21059

Heitink, M.C., Van der Kleij, F.M., Veldkamp, B.P., Schildkamp, K., Kippers, W.B., (2016). A systematic review of prerequisites for implementing assessment for learning in classroom practice. *Educational Research Review*, 17(1), 50-62 doi: 10.1016/j.edurev.2015.12.002.

Heritage, M. (2007). *Formative assessment. EED Winter conference: Informing instruction, Improving achievement*. Anchorage, AK.

Huck, S. W. (2012). *Reading statistics and research* (6th ed.). Boston, MA: Pearson.

Izci, K. (2013). *Investigating high school chemistry teachers' perceptions, knowledge and practices of classroom assessment.* (Unpublished PhD Thesis), Columbia, MO, University of Missouri-Columbia.

Izci, K. & Şardağ, M. (2014). *Fen bilgisi öğretmen adaylarının sınıf içi değerlendirme okur-yazarlığı.* 11.Ulusal Fen Bilimleri ve Matematik Eğitimi Kongresi, September 11-14, Adana, Turkey.

Karaman, P. & Şahin, Ç. (2014). Öğretmen adaylarının ölçme değerlendirme okuryazarlıklarının belirlenmesi. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi, 15*(2), 175-189.

Levy-Vered, A. & Alhija, F. N. (2015) Modelling beginning teachers' assessment literacy: the contribution of training, self-efficacy, and conceptions of assessment. *Educational Research and Evaluation*, 21(5), 378-406, doi:10.1080/13803611.2015.1117980

McGee, J. & Colby, S. (2014) Impact of an assessment course on teacher candidates' assessment literacy. *Action in Teacher Education, 36*(5), 522-532, doi:10.1080/01626620.2014.977753

McMillan, J. H. (2003). Understanding and improving teachers' classroom assessment decision making: Implications for theory and practice. *Educational Measurement: Issues and Practice, 22*(4), 34-43. doi: 10.1111/j.1745-3992.2003.tb00142.x

McNiff, J. & Whitehead, J. (2006). All You Need To Know About Action Research. London: Sage.

Milli Eğitim Bakanlığı [MEB]. (2013). *İlköğretim fen ve teknoloji dersi (6,7,8. sınıflar için) öğretim programı.* Ankara: MEB yayıncılık.

Norton, L. S. (2009). *Action research in teaching and learning: A practical guide to conducting pedagogical research in universities*. Abingdon: Routledge.

Otero, V. K. (2006). Moving beyond the "Get it or don't" conception of formative assessment. *Journal of Teacher Education, 57* (3), 247-255.

Remesal, A. (2007). Educational reform and primary and secondary teachers' conceptions of assessment: The Spanish instance, building upon Black and Wiliam (2005). *The Curriculum Journal,* 18, 27–38.

Shepard, L. A. (2000). The role of assessment in a learning culture. *Educational Researcher, 29*, 4-14.

Siegel, M. A. & Wissehr, C. (2011). Preparing for the plunge: Preservice teachers assessment literacy. *Journal of Science Teacher Education, 22*, 371-391. doi: 10.1007/s10972-011-9231-6

Smith, M. K. (2007) *"Action research", the encyclopedia of informal education*. Retrieved from http://infed.org/mobi/action-research/ on 04.06.2016.

Smith, L. F., Hill, M. F., Cowie, B., & Gilmore, A. (2014). Preparing teachers to use the enabling power of assessment. In C. Wyatt-Smith, V. Klenowski, & P. Colbert (Eds.), *Designing assessment for quality learning* (pp. 303–323). Dordrecht, The Netherlands: Springer.

Taber, K. S., Riga, F., Brindley, S., Winterbottom, M., Finney, J., & Fisher, L. G. (2011). Formative conceptions of assessment: Trainee teachers' thinking about assessment issues in English secondary schools. *Teacher Development, 15*(1), 171–186. doi:10.1080/ 13664530.2011.571500

Vardar, E. (2010). *Sixth, seventh and eighth grade teachers' conception of assessment.* Unpublished master thesis. Middle East Technical University, Ankara, Turkey.

Volante, L., & Fazio, X. (2007). Exploring teacher candidate's assessment literacy: Implications for teacher education reform and professional development. *Canadian Journal of Education, 30*(3), 749–770.

Xu, Y., & Brown, G. T. (2016). Teacher assessment literacy in practice: A reconceptualization. *Teaching and Teacher Education, 58*, 149-162.

Author Information

Kemal Izci
Necmettin Erbakan University
Eregli College of Education, Eregli/Konya, Turkey
Contact e-mail: *kemalizci@gmail.com*

Gurbuz Caliskan
Necmettin Erbakan University
Eregli College of Education, Eregli/Konya, Turkey