

Self-Efficacy Perceptions of Science Teachers for Assessment Literacy

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ABSTRACT

The purpose of this study is to examine the self-efficacy perception levels of science teachers for assessment literacy in terms of various variables by determining them and to reveal the correlation between them. The research was designed in the scanning model, one of the non-experimental quantitative methods. The sample of the study consists of 236 teachers who are in service in the secondary schools affiliated to the Ministry of National Education in the provinces and districts of Elazığ in the 2019-2020 academic year. "Self-efficacy perception scale for assessment and evaluation" was applied as data collection instrument in the study. In the analysis of the data obtained through the data collection instrument, in addition to descriptive statistics, t-test and one-way analysis of variance were used for independent samples. As a result of the research, it was determined in the comparisons that the self-efficacy of the teachers and their sub-dimensions for assessment literacy presented a significant difference in favor of the female teachers according to the gender variable. Moreover, it was concluded that the self-efficacy of the teachers and their sub-dimensions for assessment literacy significantly differ in favor of the teachers who received postgraduate education according to the educational status variable. Whereas there was no statistically significant difference in self-efficacy for assessment literacy according to the seniority variable, it was observed that the sub-dimensions of self-efficacy for assessment literacy were significantly different in favor of the teachers who were between 1-10 years of seniority according to the seniority variable. Some recommendations were provided within the scope of the results obtained at the end of the research.

Key words: Assessment Literacy, Self-efficacy, Science, Science Teacher

INTRODUCTION

Education is defined as the process of deliberately inducing a desired behavioral change in an individual. This process realizes its purpose with the effective functioning of the education system, which refers to an open system. Education consists of such sub-dimensions as target, content, and assessment and evaluation. At the end of the training process, the assessment and evaluation sub-dimension is of great importance so as to decide whether the desired behavior change, which is the main purpose of the training, has occurred. In addition to this importance of assessment and evaluation, assessment and evaluation also have an important place in the process of deciding what and how much education programs can bring to individuals, and the weak and strong aspects of the learning and training process. The purpose of assessment and evaluation in education is to determine the effectiveness of training, to collect data about the activities performed in the process, and to make a judgment about the process by interpreting these data. Assessment and evaluation, one of the sub-dimensions of education in the training process, is needed at every stage of the education system.

In the education system, the acquisition of the outcomes specified in the curriculum is as important as which students acquire these outcomes and whether the education system has been successful. Identifying students who fail in the education system and providing the necessary feedback have an important place in increasing the quality of education (Yunus, 2018). In this respect, assessment and evaluation, a process of systematically obtaining information about what students have learned, requires using time, knowledge, expertise, and other available resources in this process (Walvoord, 2010). Assessment and evaluation, which has an important place in educational fields, is expressed as all processes and products that define the nature and scope of learning, suitability for the purpose of teaching and more effective learning environment concepts related to learning and training processes. The scores obtained from tests are mostly used in order to make a decision about what and how much students have learned in education. Whereas the test scores, which are stated to be an important part of assessment and evaluation, are considered as the whole of assessment and evaluation according to some sources, the assessment is defined as an important part of evaluation according to others. According to, Willis et al. (2017):

Assessment literacy (AL) is a dynamic, context dependent social practice that involves teachers articulating and negotiating classroom and cultural knowledge with one another and with learners in the initiation, development and practice of assessment to achieve the learning goals of students.

Assessment literacy is defined as stakeholders' abilities to use assessment to fulfill both learning and grading purposes (Taylor, 2009). More specifically, teacher assessment literacy (TAL) is about teachers' mastery of knowledge, skills, and principles in planning and developing well-constructed assessment tasks, from which useful assessment data are interpreted and utilised to inform pedagogy and learning within a larger sociocultural background (Fulcher, 2012).

In order to promote consistency of practice across diverse educational contexts (Torrance & Forde, 2017), professional standards have been revised to better operationalize assessment literacy and to cover a variety of topics in the assessment practice domain, such as: the selection and development of valid and reliable assessments; the administration, score, and use of assessment results; and reporting and communication issues. On the one hand, these professional standards suggest broad definitions of assessment literacy and attention to the effective integration of educational policies and teacher education paths (e.g. in Australia and New Zealand). On the other hand, some definitions of assessment literacy still emphasize its practical aspects. Popham (2018), for example, outlines assessment literacy in terms of six high-priority concepts (measurement notions such as validity, reliability, and fairness) and procedures (techniques or methods commonly used to score report, implement formative assessment, and measure affect). This and similar conceptualizations, which tend to be related to professional standards and to focus on concepts and abilities, present an incomplete model of assessment literacy. Therefore, recent efforts have expanded assessment literacy to include socio-cultural and socio-political aspects in order to better contextualize knowledge, skills, and dispositions; to value the purpose-driven nature of assessment practice, and to understand how to integrate "assessment practice, theories, and philosophies to support teaching and learning within a standards-based framework of education" (DeLuca & Bellara, 2013, p. 356).

The Belief of Self-efficacy

The concept of self-efficacy was introduced into the literature through Social Learning Theory (Social Cognitive Theory) by Bandura. Bandura started to do his first studies on social learning in the early 1960s. Social Learning Theory focuses on cognitive concepts. With his studies, he differentiated his theory from the behavioral approach and renamed it as "Social Cognitive Theory" in 1986 (Alemdağ, 2015). It is seen that the definition of self-efficacy was firstly used by Bandura (1977).

After Bandura (1977) defined self-efficacy as "personal belief about how much an individual can resist difficulties and whether or not to act to bring about a behavior", self-efficacy has been the subject of many studies such as publications, articles, and researches. Bandura (2006) mentions

that self-efficacy beliefs increase the self-development of individual, motivation level, emotional quality of life, enable the individual to resist difficulties, and affect his/her choices while making important decisions (Güldü, 2015). Zimmerman (1995) defines self-efficacy as self-evaluation of individuals for what they can accomplish and achieve. In the definition made by Senemoğlu (2003), self-efficacy is identified as the product of the belief of an individual in what they can and will be able to do with their individual skills. While Luszczynska et al. (2005) defined self-efficacy in their study as the belief in the competencies of individual in fulfilling difficult and uncertain obligations and coping with tasks with special needs, Parlar (2009) defines it as the belief in the abilities that will enable the individual to manage his/her individual obligations. In one of the recent studies, in which several definitions were compared and tried to be made into a common definition, self-efficacy was defined as "self-belief in the extent to which the individual will or will not achieve the difficulties that will arise in her/his future life" (Islam, 2016). Apart from the definitions, it has been stated that self-efficacy is one of the driving power and key to success in doing or achieving a job (İnandı et al., 2015) and to be fully self-knowledge (Avcı, 2018).

The concept of self-efficacy is not only important in many professions and fields, but also a very important concept for the teaching profession. The level of self-efficacy beliefs varies depending on the requests, behaviors, and goals of the teachers (Tschannen-Moran et al., 2001). According to Yılmaz et al. (2004), it is stated that the self-efficacy levels of the teachers should be at a sufficient level as well as having field knowledge, pedagogical knowledge, and technological knowledge. Teachers and pre-service teachers who have high self-efficacy beliefs make more effort and produce different solutions to overcome the problems they encounter and to remove the negativities of the system (Bandura, 1977). Many studies in this field vary in terms such as removing misconceptions, ensuring effective and active participation, using technologies, designing and developing assessment-evaluation tools, and taking more responsibility for teaching among teachers with low and high self-efficacy beliefs (Tschannen-Moran et al., 2001).

Erdoğdu and Kurt (2012) examined efficacy perceptions of teachers for assessment and evaluation in terms of some variables. As a result of this research, it was determined that the assessment and evaluation efficacy perceptions of the teachers were at medium level. The study of Karamustafaoğlu et al. (2012) is to explain the determination of the qualifications of classroom teachers in complementary assessment and evaluation according to gender, professional experience, and educational status. Usta et al. (2010) revealed in their research that pre-service teachers in social studies and science prefer the traditional assessment and evaluation tools rather than complementary assessment and evaluation techniques. Yaman and Karamustafaoğlu (2011) examined the efficacy perception levels of the pre-service teachers in the field of assessment and evaluation in terms of various variables. As a result of this research, it was concluded that the efficacy perception levels of the pre-service

teachers for assessment and evaluation are not very high. In addition, it was determined that the efficacy perception levels of the pre-service teachers did not differ according to gender and programs, but differ according to the secondary education institution they graduated from. Yeşilyurt (2012) conducted a similar study on pre-service teachers by questioning in terms of such sub-purposes as the basic concepts, assessment techniques, statistical analysis, and reporting. Accordingly, it was concluded that the efficacy perception of pre-service teachers regarding the dimensions of the basic concepts and assessment techniques in the field of assessment and evaluation is “sufficient”, and it was determined that the efficacy perception regarding the dimensions of statistical analysis and reporting is “moderately sufficient”. In the study “Examination of the Perspectives of Pre-service Teachers on Assessment and Evaluation” conducted by Kubilay and Sabancu (2016), it was determined that pre-service teachers felt themselves “moderately sufficient”. In the study “Examination of Efficacy Perceptions of Pre-service Teachers for Assessment and Evaluation (Kafkas University Sample)” by Yaralı (2017), it was concluded that the efficacy perceptions of pre-service teachers for assessment and evaluation were found to be “Sufficient” in the sub-dimension of Basic Concepts, “Moderately Sufficient” in the sub-dimension of Assessment Techniques, and “Moderately Sufficient” in the sub-dimensions of Statistical Analysis and Reporting.

Looney et al. (2017) argue that more research is needed to shed light on teachers’ identities as assessors (i.e., their conceptions, beliefs, experiences, knowledge, skills and feelings) in order to better understand their assessment practice. These scholars, as well as others (Herppich et al., 2017) have provided important insights into current conceptualizations of assessment literacy. When the literature was examined, the self-efficacy perceptions of pre-service teachers and various variables affecting these perceptions were examined. In this study, the self-efficacy perceptions of science teachers for assessment literacy, knowledge and skills sub-dimensions for self-efficacy perceptions and the effects of such variables as gender, educational status, and seniority on these perceptions were examined.

Also, in this study, it was purposed to determine the perceptions of science teachers about whether they feel themselves sufficient or not in the process of assessment literacy. Accordingly, an answer was sought for the following sub-goals.

1. What is the level of self-efficacy of science teachers for assessment literacy?
2. Do self-efficacy and self-efficacy sub-dimensions of science teachers for assessment literacy show a statistically significant difference according to the variables of gender, seniority, and educational status?

METHOD

This section includes explanations for the research model, study group, data collection instruments, and statistical techniques used for data processing and analysis.

Research Design

This study, which purposes to examine the self-efficacy perceptions of science teachers for assessment and evaluation, is a screening model, one of the non-experimental quantitative methods, and has a descriptive nature (Johnson & Onwuegbuzie, 2004). The screening method is a research approach that purposes to describe a past or present situation or event as it exists, to compare the correlation between variables, and to collect data in a certain period of time without being dependent on any instantaneous interpretation (Karasar, 2002).

Study Group

The population of this research consists of teachers working in secondary schools affiliated to the Ministry of National Education in the provinces and districts of Elazığ in the 2019-2020 academic year. In order to determine the success of teacher training programs in assessment and evaluation in the selection of the study group, the teachers participating in the study were required to receive the assessment and evaluation training provided in the in-service programs. Therefore, the sample type selected for the research is the criterion sample, which is one of the purposeful sampling methods (Büyüköztürk et al., 2018, p. 92). The study group of the study consists of 236 teachers working in secondary schools in Elazığ province and districts (Table 1).

Data Collection

The “Self-efficacy Perception Scale for Assessment and Evaluation in Education” generated by Kılınç (2011) was applied as data collection instrument in this study. The scale consisting of 23 items is a 5-point Likert scale. The items in the scale are arranged as “strongly disagree” and “strongly agree”. The scale includes two sub-dimensions: knowledge and skills. Cronbach’s Alpha coefficient is calculated as 0.93 for the first sub-dimension and 0.95 for the second

Table 1. Socio-demographics features of the participants

Features	F	(%)
Gender		
Male	134	57
Female	102	43
Total	236	100.0
Educational background		
Bachelor’s degree	186	79
Master’s degree	50	21
Total	236	100.0
Professional seniority		
0-10 years	105	44
11-20 years	75	32
21 years and above	56	24
Total	236	100.0

sub-dimension. At the end of the study, Cronbach's alpha reliability coefficient was determined as 0.928.

Data Analysis

SPSS 20.0 package program was used for data analysis. The data obtained from the data collection tools were analyzed by using descriptive statistics (arithmetic mean, standard deviation). In order to analyze the data obtained from the self-efficacy perceptions of science teachers for assessment literacy, it was checked whether the data met the general conditions of parametric tests. The Shapiro-Wilks test was conducted to examine whether the data showed normal distribution. The histogram graph examined through the sample taken from the independent variable revealed that the data showed a normal distribution. The fact that Shapiro-Wilks test results were not statistically significant ($p > .05$) supported the result obtained from histogram graphics. Therefore, t-test for independent groups was applied in order to determine whether the self-efficacy scores of the teachers for assessment literacy show a significant difference in terms of gender and educational status variables, and one-way analysis of variance (ANOVA) was used to determine whether the self-efficacy scores of teachers for assessment literacy showed a significant difference in terms of seniority variable.

FINDINGS

Findings Related to the First Sub-Question

The first sub-problem of the study was stated as "What is the level of self-efficacy of science teachers for assessment literacy?". The arithmetic mean and standard deviation values of self-efficacy scale sub-dimension and total scores teachers for assessment literacy were calculated so as to find an answer to this sub-question. The arithmetic mean and standard deviation values of the sub-dimensions and total scores of each item in the self-efficacy scale for teachers to use assessment literacy approaches are presented in Table 2.

When Table 2 is examined, it is observed that the mean of the total scores the teachers got from the self-efficacy scale for assessment literacy is "3.64". In scales with a five-score rating, the mean value per item can be calculated by dividing the total score value by the number of items. According to this calculation, 1.00-1.80 score range is interpreted as "Strongly disagree", 1.80-2.60 score range as "Disagree", 2.60-3.40 score range as "Undecided", 3.40-4.20 score range as "Agree", and 4.20-5.00 score range as "Strongly Agree". Considering the five-point grading feature of the scale, it is seen that the mean value of "3.64" corresponds to the "Agree" interval. Therefore, it can be concluded that

Table 2. Arithmetic Mean and Standard Deviation Values of Self-Efficacy of Teachers for Assessment literacy

Self-efficacy	N	M	SS	Min	Max
Knowledge	236	3.93	.94	1.91	5
Skill	236	3.35	.62	1	5
The whole of scale	236	3.64	.78	1.45	5

the self-efficacy levels of the teachers for using assessment literacy approaches are close to a high level.

Similarly, when the sub-factor mean scores of the scale are taken into account, it is observed that the mean scores of the teachers in the self-efficacy for knowledge dimension correspond to the "agree" interval, and the mean scores of the teachers in the self-efficacy for skill dimension correspond to "Undecided" interval.

Findings Related to the Second Sub-Question

The second sub-question of the study was stated as "Do self-efficacy and self-efficacy sub-dimensions of science teachers for assessment literacy show a statistically significant difference according to the variables of gender, seniority, and educational status?". T-test for independent groups was applied in order to determine the change status of teacher answers to the two sub-dimensions of the self-efficacy scale for assessment literacy according to the gender variable, and the data obtained from the analysis are provided in Table 3.

When the results of the independent groups t-test according to the gender variable in Table 4 are examined, it is seen that a significant difference in favor of female teachers is available among teacher opinions on the "Knowledge" sub-dimension [$t(234) = -3.138$; $p = .018$] of self-efficacy beliefs. It was also revealed that there is a significant difference in favor of female teachers. The mean score ($M = 3.71$) regarding the opinions of female teachers is higher than the mean score for male teachers ($M = 3.34$). Accordingly, it can be stated that the beliefs of female teachers about the knowledge sub-dimension are more advanced than the male teachers. There is a significant difference among teacher opinions on the "Skill" sub-dimension [$t(234) = -4.678$; $p = 0.00$] of self-efficacy beliefs in favor of male teachers. The mean score ($M = 2.71$) for the opinions of female teachers is lower than the mean score for the male teachers ($M = 2.98$). A significant difference was found among the opinions of science teachers in education assessment-evaluation self-efficacy belief scale [$t(234) = -4.428$; $p = 0.02$] in favor of female teachers.

One-way analysis of variance was applied in order to determine the changes in the answers given by the teachers to the two sub-dimensions of the self-efficacy scale for assessment literacy according to the seniority variable, and the data obtained as a result of the analysis are given in Table 4.

Table 3. T-test results according to gender variable

Sub-scale	Gender	N	M	Ss	df	t	p
Knowledge	Female	134	3.71	.54	234	-3.138	.018
	Male	102	3.34	.56			
Skill	Female	134	2.71	.54	234	-4.678	.000
	Male	102	2.98	.65			
Self-efficacy perception (The Whole of Scale)	Female	134	3.02	.31	234	-4.428	.002

Table 4. The results related to one-way analysis of variance according to seniority variable

Sub-dimensions	Seniority	N	M	S	F	p	Difference
Knowledge	1-10 years	105	4.08	.66	2.379	.031	1-3
	11-20 years	75	3.92	.78			
	<21 years	56	3.86	.70			
Skill	1-10 years	105	3.12	.47	5.254	.002	1-2,3
	11-20 years	75	2.82	.49			
	<21 years	56	2.97	.45			
Self-efficacy Perception (The Whole of Scale)	1-10 years	105	3.55	.56	1.002	.089	...
	11-20 years	75	3.37	.73			
	<21 years	56	3.42	.67			

Table 5. t-test results according to the variable of educational status about assessment literacy

Sub-scale	Educational Status	N	M	Ss	df	t	p
Knowledge	Undergraduate	186	3.85	.72	234	2.537	.012
	Graduate	50	4.13	.69			
Skill	Undergraduate	186	2.68	.74	234	3.509	.001
	Graduate	50	3.26	.53			
Self-efficacy Perception (The Whole of Scale)	Undergraduate	186	3.27	.68	234	3.772	.000

It was determined that there is a significant difference according to the seniority variable between the opinions of teachers about the “knowledge” sub-dimension of assessment literacy self-efficacy perceptions in education [$F(2,193) = 2.376, p < .05$]. According to the LSD difference test results, it was understood that this difference was in favor of teachers with a seniority of 1-10 years ($M = 4.08$) and among the opinions of teachers with seniority of 21 years and more ($M = 3.86$). Similarly, it was found that there is a significant difference between their opinions on the “skill” sub-dimension according to the seniority variable [$F(2,193) = 5.254, p < .05$]. According to the LSD test, a significant difference emerged between the opinions of teachers with seniority of 11-20 years ($M = 2.82$), and more than 21 years ($M = 2.97$), and it is in favor of teachers with a seniority of 1-10 years ($M = 3.02$). According to the findings in the whole scale, there was no statistically significant difference between the opinions of science teachers according to the seniority variable [$F(2,193) = 1.002, p > .05$].

Independent group t-test was applied so as to determine the change status of teacher answers to the two sub-dimensions of the self-efficacy scale for assessment literacy according to the educational status variable, and the data obtained as a result of the analysis are presented in Table 5.

When the general self-efficacy beliefs in Table 5 were examined, a significant difference was observed in general self-efficacy beliefs of the science teachers in favor of graduate teachers according to their educational status [$t(234) = 3.772, p < .05$]. When considered on the basis of sub-dimensions, it is seen that the knowledge and skill self-efficacy beliefs of teachers show a significant difference in favor of graduate teachers [$t(234) = 3.509, p < .05$]. It was concluded that the means of the teachers with graduate degree were higher than the teachers with undergraduate degree.

DISCUSSION AND CONCLUSION

In the study, it is understood that the mean score that science teachers got from the self-efficacy scale for assessment literacy approaches in education is in the interval of “Agree”. In addition, in the study, it was determined that the mean score of the participants in the self-efficacy of knowledge sub-dimension corresponded to the “Agree” interval, and the mean score they received in the self-efficacy sub-dimension of skill corresponded to the “Undecided” interval. It is thought that this may be due to teachers’ having seen in-service training approaches for assessment literacy and having sufficient knowledge about these issues. When the studies in the literature are examined, it is understood that similar findings have been obtained. In the studies by Şahin and Ersoy (2009), it is concluded that most of the answers by the pre-service classroom teachers regarding their proficiency levels in assessment and evaluation in the new primary education program are between “sufficient” and “moderately sufficient”. In the studies conducted by Çoklar and Odabaşı (2009), it was comprehended that the mean of self-efficacy scores for the assessment and evaluation sub-dimension of the scale for determining educational technology standards was calculated as 3.80 and that they considered themselves sufficient. In addition, Banoğlu (2009) found that the teachers mostly found themselves sufficient in alternative assessment methods, and Ogan-Bekiroğlu (2009) concluded that the self-efficacy of pre-service physics teachers regarding assessment was quite high. On the other hand, in some studies, it is observed that the self-efficacy of the participants regarding the knowledge and skill sub-dimensions of assessment-evaluation is low. In the experimental study, Buldur (2009) concluded that the self-efficacy scores of pre-service teachers (in all of the self-efficacy factors for resource use,

coping with difficulties, and implementation) increased significantly after the training process.

In the study conducted with science teachers, it was concluded that the self-efficacy of the participants for applying assessment literacy approaches showed a significant difference according to the gender variable, except for the knowledge sub-dimension and the skill sub-dimensions. When the relevant literature was examined, it was seen that similar research findings were reached (Okur & Azar, 2011; Şaşmaz-Ören et al., 2014; Yenice et al., 2014). Yenice et al. (2014) found that pre-service science teachers showed a significant difference in favor of female pre-service teachers in other sub-dimensions and total scores except for the sub-dimension of "Self-efficacy for Resource Use". Şaşmaz Ören et al. (2014) concluded that the self-efficacy of pre-service teachers for using alternative assessment and evaluation approaches showed a significant difference in favor of female pre-service teachers in sub-dimensions and total scores except for the "Self-Efficacy for Practice" sub-dimension according to the gender variable. Karamustafaoglu et al. (2012) found in their study that the opinions of classroom teachers about using alternative assessment and evaluation techniques differ significantly in favor of female teachers in terms of gender variable. Similarly, in the study by Okur and Azar (2011), it was concluded that teacher opinions about using alternative assessment and evaluation techniques differ significantly in terms of gender variable. It can be stated that the aforementioned study findings support the findings of current research. On the other hand, in his study, Parmaksız (2004) found a significant difference in favor of male teachers in the self-efficacy perceptions of social studies teachers for alternative assessment and evaluation methods. A similar result is encountered in the study by Okur (2006). In addition, Metin (2012), in his study with classroom teachers, found that male and female pre-service teachers had similar self-efficacy for using assessment and evaluation approaches and that their self-efficacy did not differ significantly according to gender variable. Similarly, in the studies conducted by Ak and Güvendi (2010), Bal and Doğanay (2010), Banoğlu (2009) and Nazlıççek and Akarsu (2008), it was concluded that the teacher attitudes towards alternative assessment and evaluation methods and their self-efficacy perceptions did not change and that the similar results were obtained.

As a result of the analyzes conducted to determine the change in self-efficacy of science teachers for assessment literacy according to the seniority variable, it was determined that the total score means of the "Knowledge" sub-dimension and "skill" sub-dimension of the scale of the teachers showed a significant difference according to their seniority level. In addition to this, as a result of the analysis made regarding between which groups the differences were obtained, it was determined that in the "Knowledge" sub-dimension, there was a significant difference between science teachers with a service period of 1-10 years and science teachers with 21 years or more in favor of science teachers with the seniority of 1-10 years. Moreover, it was concluded in the study that there was a significant difference in the skill sub-dimension total score means between science teachers

with a service period of 1-10 years, science teachers with 11-20 years, and 21 years and more in favor of science teachers with the seniority of 1-10 years. Self-efficacy is an emotion based on experience (Bandura, 1986). In this context, depending on the experience of science teachers with the seniority of 21 years or more, it is expected that their self-efficacy perceptions will be higher than other seniority levels. However, the result is the opposite of this situation. This situation depends on the fact that the knowledge and skills concepts related to assessment literacy that science teachers who have graduated from their undergraduate education within the period of 1-10 years are remembered, that the new methods and technical knowledge learned for the constructivist approach are put into practice in their professional lives, and that they play an active role in in-service training. As a result, it can be said that their self-efficacy is high. As a similar result, in the study by Geçim (2017), the level of assessment and evaluation efficacy perceived by teachers differs according to the seniority variable. However, many studies have obtained results in the opposite direction to the result of this research. Çalışkan (2012) and Çalışkan and Yazıcı (2013) concluded that there was no difference between the self-efficacy perceptions of social studies teachers and their attitude levels according to their seniority. Again, Üztemur (2013) did not find a significant difference between the self-efficacy scores of social studies teachers according to their seniority. Kaya et al. (2012) stated that teachers' knowing alternative assessment and evaluation techniques, their practice levels differ significantly according to their seniority and that the teachers with the seniority of 21 years and more have higher knowledge and practice levels of alternative assessment and evaluation techniques than the teachers working between 0-10 years.

Another result obtained from the study is that there is a significant difference in favor of the graduate teachers in terms of "Knowledge" and "Skill" factors between the efficacy perceptions of the participants for assessment literacy and their educational status. Özenç (2013), in his study that aimed to determine the alternative assessment and evaluation efficacy of classroom teachers, concluded that there is a significant difference between the alternative assessment and evaluation efficacy of the teachers and their educational status in favor of teachers with graduate degree. This result supports the current study. When the study conducted by Aksoy (2018) was examined, it was stated that there was no significant difference between the self-efficacy of the primary and secondary school teachers in the use of alternative assessment tools and their education levels. This result does not support the finding obtained in the current study. Similarly, Bağcı (2011), in his study with a sample of primary school teachers, concluded that there was no significant correlation between the ability of primary school teachers to use alternative assessment and evaluation techniques effectively and whether or not to receive postgraduate degree. When these studies are examined, it is observed that the number of participants with graduate degree is much less than the participants with undergraduate degree. It can be mentioned that these results do not support the study since the graduate

teachers cannot fully represent the population. In addition, the fact that it is not known exactly in which department the teachers have graduated can be claimed as the result of this difference.

In conclusion, it was concluded that the self-efficacy of the science teachers for using assessment literacy approaches is close to a high level. In addition, it was determined that the self-efficacy of the science teachers for assessment literacy showed significant differences in sub-dimensions and total scores in terms of such variables as gender, seniority, and educational status.

The following recommendations have been developed within the scope of the results. The content quality of in-service training for teachers should be increased to increase the self-efficacy of the teachers. It should be ensured that the instructors assigned in in-service trainings are equipped and experienced. This practice can be applied with the teachers from different branches, and the studies can be compared. Since it will be difficult for the teachers to change the traditional assessment literacy practices that the teachers have been using for years (Lock & Munby, 2000), both pre-service and in-service teachers should be supported in terms of the use of alternative assessment and evaluation tools. In addition, this research can be studied qualitatively in depth, and the ability of teachers to use assessment and evaluation techniques can be determined.

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