INVESTIGATION OF PROSPECTIVE TEACHERS' BELIEF TOWARD AUTHENTIC ASSESSMENT AND GROUPWORK SKILLS

*Serpil Çelikten
İsmail Kinay
Dicle University
*sserpilcelikten@gmail.com

ABSTRACT

The purpose of this study was to investigate whether the prospective teachers' average scores based on new component comprising of the subdimensions of the Authentic Assessment Belief Scale and Groupwork Skills Scale differs from each other significantly in terms of the field factor they are studying. For this purpose, in the context of survey research, the descriptive and correlational investigations were presented and then multivariate analysis of variances (MANOVA) was conducted on the study group including 434 prospective teachers. Results show that subdimensions of these scales were correlated at moderate level in general and the score means differ from each other at each subdimension according to the field factor. Moreover, when each subdimension were treated as dependent variable and were analyzed simultanously, it was concluded that prospective teachers differ from each other in terms of field factor depending of the new component resulting from MANOVA. Lastly, when post-hoc test were conducted it was observed that in general, highest scores were obtained by the prospective teachers that are studying at the field of language education, whereas the lowest scores were obtained with the field of social sciences. The results have implications on the simultaneous examination of at least two psychological construct when making inferences about the prospective teachers and by the way considering the probable differences based on the different fields they were trained.

Keywords: *Prospective Teachers, Belief Toward Authentic Assessment, Groupwork Skills*

INTRODUCTION

Educational assessment procedures are used for many purposes such as making admissions, placement, or diagnostic decisions (Crocker & Algina, 1986). There are different requirements to meet the needs of the related assessment processes. In this way, many educational test formats could be administered to the students in order to make decisions depending on their test results. The test comprising of multiple choice items is one of the commonly used test format all over the world with the purpose of selection or placement of the students. Besides this format, there are various test formats comprising of true-false answers or constucted item responses. All these test formats could be called educational achievement tests that are used to evaluate the students' educational learning processes. Whereas, since assessment based on these test formats includes only the scoring of the items, there are some criticism about the insufficiency of the overall assessment of the individuals because there should be a diversity of sources in terms of the assessments of data, for the educational policies (Mislevy, 2007; Schildkamp, 2019). In fact, humans are inherently a complex organism and there should be different methods beyond these testing procedures to measure the students in terms of the complex cognitive

processes called higher order cognitive skills. Ercikan and Oliveri (2016) stated that assesment of spesific elements of a construct, especially the ones associated with higher order thinking is an crucial issue to be handled in the assessment design so as to provide validity evidences from different aspects of the construct.

Planning an assessment design taking into consideration the different aspects of the cognitive processes of the individuals is an important part of the validity of the assessment procedures (Mislevy, 2007) because typical educational achievement tests comprising of multiple choice items could be inadequate to measure the higher order cognitive skills (Kelleghan, Greaney, & Murray, 2009) such as problem solving, critical thinking, or creative thinking skills (Kutlu, Doğan, & Karakaya, 2014). At this point, assessment procedures such as performance based assessment, or authentic assessment is arising as measurement processes (Olfos & Zulantay, 2007). Authentic learning and assessment process including many performance based activities plays an important role during the development and attainment of the higher order cognitive skills of the students.

Authentic assessment is one of the ways that enables students to integrate their skills to the real life condition (Karakuş, 2006). This process needs to include real life activities (Mohamed & Lebar, 2017) with modeling the cases and providing and sharing solutions from different thinking perspectives. Due to the needs for many authentic performance activities, cooperation of the students influence the products stemming from this process. Therefore, groupwork skills play an important role through the authentic learning and authentic assessment processes (Fook & Sidhu, 2010; Morris, 2001; Wiggins, 1990). Besides many cognitive skills, affective domain is a crucial aspect of the learning processes for the readiness of the students which could be related to the belief to an extent. Studies show that belief towards the learning affects behaviours, decisions, educational strategies and practices of the individuals at the learning environment (Hashweh, 1996; Nespor, 1987; Vanderbilt, 2008; Waters-Adams, 2006). Therefore, it could be considered that the learning skills and the belief toward the learning may be related with each other.

Learning processes could be associated with constructivitist paradigm (Postholm, 2012) and in this way constructive aspect of the prospective teachers could be considered as an important factor that shape prospective teachers' self-efficacy beliefs in positive direction (Eren, 2009). Therefore, the teacher training programs are likely to differ from each other depending on the mastery goals of it because some programs are more likely to incorporate the constructivits aproach. Due to the spesific objectives of each program of the teacher training, prospective teachers tend to shape their beliefs in a different ways depending on the field they are studying.

When these studies were investigated, it is thought that belief toward the authentic assessment and groupwork skills could be related to an extent and these variables could be considered simultaneously to reveal whether the prospective teachers differ from each other in terms of the field variable.

The purpose of this study is to investigate whether the prospective teachers' average scores based on the new component comprising of the subdimensions of the Authentic Assessment Belief Scale and Groupwork Skills Scale differs from each other significantly in terms of the field they are studying. As preliminary analysis, correlations between the dependent variables and related descriptive statistics were computed and the research questions below were investigated:

1) How is the degree of correlations between the subdimensions of the scale of authentic assessment belief and scale of groupwork skills?
2) How is the means of the subdimenions of these scales in terms of the prospective teachers' field they are studying?
3) Do the prospective teachers' average scores based on the new component differs from each others significantly in terms of the field they are studying?
4) Do the prospective teachers' average scores based on each subdimension of the scales differ from each others significantly in terms of the field they are studying?

METHODOLOGY

Research Design

This study was conducted on the basis of survey research. Survey research includes collecting data through the instruments like tests or questionnaires to describe the characteristics of groups or individuals (Fraenkal & Wallen, 2008).

Study Group

This study was conducted on the study group including 434 prospective teachers in the 2018-2019 academic year. The prospective teachers participating in the study was grouped under 4 field as social sciences education, language eduaction, mathematic and science education, and primary education according to the department they are trained. Social sciences education is comprised of the students with the department of social studies, history and geography education. Language education is comprised of the students with the department of English and German language education field, Turkish language for elementary students, and Turkish language and literature. Mathematic and science education field is comprised of the students with the department of elementary mathematics, secondary mathematics, elementary science, biology andchemistry. Lastly, primary education field is comprised of preschool education and primary school education. Descriptives of the demografic variables of the prospective teachers in the study group were presented at Table 1:

Table 1
Descriptives of the demografic variables of the prospective teachers in the study group

	Variable	n	%
Gender	Female	292	67,28
	Male	142	32,72
Field	Social sciences education	117	26,96
	Language education	119	27,42
	Mathematic and science education	98	22,58
	Primary education	100	23,04
Year	1. Year	109	25,12
	2. Year	67	15,44
	3. Year	145	33,41
	4. Year	113	26,04
Total		434	100,0

Data collection tools

As data collection tools, Authentic Assessment Belief Scale and Groupwork Skills Scale were used.

Authentic Assessment Belief Scale: The scale developed by Kinay (2018) is comprised of 17 items with three subdimensions as belief toward teacher's role, belief toward student's role and assessment method. In this study, Cronbach Alpha reliability for dimension of belief toward teacher's role, belief toward student's role and assessment method is 0.81; 0.78 and 0.67 respectively. Moreover for the overall reliability of the scale belief toward authentic assessment, stratified cronbach alpha was calculated as 0.88.

Groupwork Skills Scale: The scale developed by Cumming et al. (2015) and adapted to Turkish culture by Ozan (2018) is comprised of 10 items with two subdimensions as task and interpersonal. In this study, Cronbach Alpha reliability for dimension of task and interpersonal is 0.72 and 0.76 respectively. Moreover for the overall reliability of the scale, stratified cronbach alpha was calculated as 0.84.

When these reliability coefficients were compared with the critical values (Salvucci, Walter, Conley, Fink, & Saba, 1997) it was seen that the measurements both in terms of subdimensions and overall of the scale were at moderate level which shows that the measurement results are reliable to go on with further analysis.

Data Analysis

In this study, in order to answer the research questions many analysis were conducted. In this way, desciptive statistics, pearson product-moment correlation coefficient and multivariate analysis of variances (MANOVA) were used. Before the main analysis, assumptions were considered. To conduct MANOVA, there are some assumptions required to be met. These requirements are about the sample size, normality of distribution, outliers, linearity, homogenity of variance-covariance matrices, and multicollinearity and singularity (Tabachnick & Fidell, 2013). Firstly, for the sufficiency of the sample size, there should be more cases than DVs in every cell for the power of the analysis. When the sample size was considered, it was concluded that this requirement was satisfied exactly. Secondly, for the investigation of the assumption of normality, histograms and skewness and kurtosis statistics were evaluated. It was seen that apart from the roles of teachers' subdimension of authentic scale, all dependent variables met the assumption. Fortunately, with large sample sizes, normality assumption is getting away being a threat on the results. In other words, a variable with statistically significant skewness and kurtosis often does not imply a substantive difference in the analysis. To state a number for sample size, if the sample size is over 200, analysis are robust to the violation of normality assumption (Waternaux, 1976). Moreover, Seo, Kanda, and Fujikoshi (1995) have shown robustness to nonnormality in MANOVA with overall $N = 40$ ($n = 10$ per group). Besides normality assumption, linearity assumption was checked through the investigation of the scatterplots. Moreover, for the assumption of homogenity of variance-covariance matrices, Box' s M test was used. However, this test tends to result in significant p-values in large samples. Fortunately, this violation could be ignored if the groups are of approximately equal size. To test it, the condition of "Largest group size ÷ Smallest group size < 1.5" were checked (Hair, Black, Babin, & Anderson, 2009) and this condition was satisfied in this study with the ratio of 119/98 which results in 1,214 lower than 1.5. Then, investigation of the outliers in terms of both univariate and multivariate were investigated and the cases as outliers in the data set were elimanated because MANOVA is sensitive to the outliers. For the univariate outliers, standardized z-values were used whereas for the multivariate outliers, mahalanobis distance is appropriate to use (Tabachnick & Fidell, 2013). As univariate outlier 13 cases and as multivariate outliers 4 cases were discarded from the data set. As a result the sample size 434 was evaluated in terms of approppriateness to conduct MANOVA analysis. All analyses were conducted through the Statistical Package for the Social Sciences (SPSS). After the significant result of MANOVA, ANOVA analysis was conducted to each dependent variable seperately. Then, scheffe as post-hoc test was used.

FINDINGS

In this study, the investigations were made by considering the subdimensions of the two scales in terms of the prospective teachers' field at which they are studying. Means and standard deviations of the subdimensions according to the prospective teachers'field were presented in the Table 2:

Table 2
Means and standard deviations of the subdimensions of the two scales in terms of the prospective teachers' field

		Social sciences education (N=117)		Language education (N=119)		Mathematic and science education (N=98)		Primary education (N=100)	
		$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd	$\bar{X}$	sd
Belief toward authentic assessment	Belief toward teacher role	4.03	1.00	4.57	0.49	4.39	0.57	4.41	0.65
	Belief toward student role	3.87	0.84	4.26	0.64	4.17	0.56	4.18	0.59
	Belief toward assessment method	3.79	0.70	4.31	0.45	4.18	0.56	4.25	0.52
Groupwork skills	Task	3.84	0.74	4.15	0.56	3.91	0.58	3.96	0.65
	Interpersonal	3.87	0.77	4.28	0.50	4.04	0.60	4.19	0.59

When the Table 2 was examined, it was seen that means of the subdimensions scores differ from each other according to the field of the prospective teachers. It was seen that the highest mean scores were obtained under the field of language education through the all subdimensions. Whereas, under the field of social sciences education through the all subdimensions, the lowest means were obtained.

Besides the descriptive statistics, it is important to examine the extent of the relations between the subdimensions of the scales (dependent variables) so as to go on with multivariate analysis of variances. In this way, pearson product-moment correlation coefficients were obtained for each pair of subdimensions and it was presented at Table 3:

Table 3
Pearson product-moment correlation coefficients for each pair of subdimensions of the scales

		Belief toward authentic assessment			Groupwork skills	
		Belief toward teacher's role	Belief toward student's role	Assessment method	Task	Interpersonal
Belief toward authentic assessment	Belief toward teacher's role	1	0.65	0.59	0.41	0.50
	Belief toward student's role		1	0.60	0.33	0.40
	Belief toward assessment method			1	0.37	0.48
Groupwork skills	Task				1	0.63
	Interpersonal					1

When the Table 3 was examined, it was seen that pairs of subdimensions are moderately correlated with each others. This result showed that it was appropriate to conduct MANOVA analyses to investigate the difference between the prospective teachers based on the new component comprising of the subdimensions of these two scales.

To investigate whether there are significant difference between prospective teachers with different fields depending on the new component as a function of subdimensions of the scales, MANOVA was conducted and results were presented at Table 4:

Table 4
MANOVA results in terms of the field variable depending on the subdimensions of the scales

	Value	F	df	p-value
Pillai's Trace	0.16	4.66	15.00	0.00
Wilks' Lambda	0.85	4.82	15.00	0.00
Hotelling's Trace	0.18	4.98	15.00	0.00
Roy's Largest Root	0.16	13.27	5.00	0.00

 *$p < 0.05$

As seen from Table 4, there is statistically significant difference based on the new component of the dependent variables in terms of the field of the prospective teachers. In other words, this result shows that when prospective teachers' subdimension scores about beliefs toward authentic assessment and their groupwork skills considered as a component, it was seen that prospective teachers differ form each other significantly according to the fields they are studying.

After conducting the MANOVA, ANOVA was conducted for each dependent variable/subdimension seperately in order to examine whether there is significant difference according to the field of the prospective teachers depending on each dependent variable. In other words, in order to reveal the significance of uniqe variances of each subdimension, these variance analysis were conducted and presented at Table 5:

Table 5
ANOVA results of each subdimension according to field factor

Dependent variable	df	Mean Square	F	Sig.
Belief toward teacher's role	3	6.16	12.14	0.00
Belief toward student's role	3	3.41	7.50	0.00
Belief toward assessment method	3	6.39	19.79	0.00
Task	3	2.07	5.14	0.02
Interpersonal	3	3.75	9.69	0.00

When Table 5 was examined, it was seen that each ANOVA based on each subdimension as dependent variable presents statistically significant difference according to the field factor. In other words, in terms of each subdimension of the scales respectively, prospective teachers differ from each other based on the field they are studying. This means that each subdimension contributes to the variances of new compnent significantly. To see the field pairs that provides statistically significant difference, post-hoc tests were conducted and presented at Table 6:

Table 6

Post-hoc test results for each pair of field

Dependent variables	Pairs	Mean difference	Standard error	Significance
Belief toward teacher's role	Social sciences - language education	-0.54	0.09	0.00
	Social sciences - math and science	-0.37	0.10	0.00
	Social sciences - primary education	-0.39	0.10	0.00
Belief toward student's role	Social sciences-language education	-0.39	0.09	0.00
	Social sciences - math and science	-0.30	0.09	0.01
	Social sciences - primary education	-0.31	0.09	0.01
Belief toward assessment method	Social sciences - language education	-0.52	0.07	0.00
	Social sciences - math and science	-0.39	0.08	0.00
	Social sciences - primary education	-0.46	0.08	0.00
Task	Social sciences - language education	-0.31	0.08	0.00
Interpersonal	Social sciences-language education	-0.41	0.08	0.00
	Social sciences-elementary education	-0.32	0.08	0.00

When the post-hoc results were examined, it was seen that prospective teachers studying at the field of language education, primary education and math and science education are better than the prospective teachers at the field of education of social sciences in terms of the three dependent variables which are belief toward teacher's role, belief toward student's role and assessment method. Moreover, in terms of the task, only the prospective teachers studying at the field of language are better than the students studying at the field of the education of social sciences. Lastly, for the dependent variable of interpersonal dimension, prospective teachers at the field of language and primary education are better than the ones studying at the field of social sciences education. In general, the highest scores were obtained by the prospective teachers that were studying at the field of language education, whereas the lowest scores were obtained with the field of social sciences.

DISCUSSION

In this study's investigations on whether the prospective teachers' average scores based on the new component comprising of the the subdimensions of the Authentic Assessment Belief Scale and Groupwork Skills Scale differ from each other significantly in terms of the field they are studying. Since the scales have subdimensions, it was proposed to consider these all subdimensions simultanously so as to provide a clearer picture of the study. In this way multivariate analysis of variances were conducted. Before this analysis, correlations were considered as preliminary analysis. Investigations of these correlations reveal that there are in general moderate relations between subdimensions of the scales (Büyüköztürk, 2013). Since, students maintain their learning process with cooperation of each other instead of competititon in authentic learning environment (Fook & Sidhu, 2010; Morris, 2001; Wiggins, 1990), results of the correlations between the subdimensions could be assosicated with the reality of the cooperation underlying the process of authentic learning.

In the study conducted through an experimental design, Kinay and Bağçeci (2016) revealed that authentic assessment increased the prospective teachers' willingness of cooperative decision making skills. This results also imlies that the Authentic Assessment Belief and Groupwork Skills could be considered simultanously due to the relations of these features with each other. Therefore, this two features with their subdimensions were analyzed simultanously through the multivariate analyses of variances in terms of the fields the prospective teachers were studying. Through these analyses, statistically significant result was obtained. This result shows that prospective teachers differ from each other depending on the new component of the subdimensions of the featured considered in the study in terms of the field. Prospective teachers' educational experiences are likely to be shaped depending on their beliefs, and their beliefs are likely to influence their skills. At this way, the Authentic Assessment Belief and Groupwork Skills are considered to be in relation with each other. Therefore, they were

considered simultanously in this study and a new component was proposed based on these constucts in terms of their subdimensions. As a result, it was seen that the new component has an important factor that make difference between the prospective teachers according to the field they were studying. This result aligns with the association of authentic assessment with the cooperative decision making skills as stated in previous study.

Besides the overall significant difference resulted from the multivariate analysis, direction of difference is another important issue so as to provide detailed results. At this way, pairs in terms of the fields prospective teachers studying were compared to reveal the ones that differ from each other significantly. In this direction, post-hoc test were conducted and results were investigated. Investigations showed that at the subdimensions of belief toward teacher's role, belief toward student's role and assessmentmethod of theauthentic assessment belief scale, results are similar in terms of the difference of the direction. To provide detailed picture, prospective teachers at the field of social sciences have lower scores than the fields of mathematic and science education, language education and primary education. At the task subdimension of the groupwork skills scale, only one pair of fields which are social sciences and language differ form each other significantly with lower scores of social sciences. Lastly, at the subdimension of groupwork skills scale, it was shown that prospective teachers at the social sciences have lower scores than the ones at the field of both language education and primary education. It is clearly seen that prospective teacher at the field of social sciences in general have lower scores than the prospective teachers studying at other fields. Since each teacher training program reqires different goals and includes different objectives in this way, these differences are likely to be a result of the background of the teacher training programs. For example, at some fields, the learning processes are more likely to be theory-based while at the others are more activity-based. The reason why the scores of the prospective teachers at the field of social sciences differ from their counterparts at the fields of language education, primary education, mathematic and science education could be related with this situation. To provide detailed explanation about these findings, the studies conducted through processes of the project based learning, one of the learning method related with authentic learning environment, were investigated. General results obtained from the studies show that these type of processes including the activity based learning methods is effective at the field of language education (Kimsesiz, 2017), mathematic (Savuran, 2007) and science (Korkmaz & Kaptan, 2002) education whereas it is not effective at the field of social sciences (Çiftçi, 2006). Moreover, Lee and Lin (2019) explored the motivational strategies beyond the Dörnei's taxanomy with a group of teachers of English as a Foreign Language through a qualitative data obtained from many sources. They revealed that incorporation of authentic materials is one of the motivational strategies adopted by these language teachers because they consider that the incorporation of authentic materials make language learners apply their language proficiency to real-life situations. Besides the language education, Osmanoglu (2016) examined the prospective math teachers reflections through the videoed teaching and showed that applying theoretical knowledge to teaching practices appears as an important issue coming up with real-life examples. When these studies are considered, it was seen that the fields related with language, science and math, and primary education are likely to require the participants or learners to apply the knowledge to real life situations through a variety of activities. This situation leads the teachers or prospective teachers to obtain the related teaching skills so as to they can organize an interactive learning environments. Therefore, it could be concluded that prospective teachers are equipped depending on the field they were studying so as to meet the needs of the students.

CONCLUSION AND RECOMMENDATION

In this study, prospective teachers' belief toward authentic assessment and groupwork skills were investigated together through the both univariate and multivariate analyses according to the field they are studying. Since the results present the relationship between the belief toward authentic assessment and groupwork skills, and also their simultaneous effect, it is suggested that teacher training programs could be uptaded to integrate the groupwork skills so that they could be able to cope with real life problems at the learning and teaching environments, beause they are likely to meet many the unexpected situations at these environments though their working life. Moreover, for future research, it is important to conduct more multivariate analyses so as to see the effects of correlated many variables

simultanously in order to provide critical results for the improvement of the teacher training programs, because these programs should be considered as a component of many factors. Therefore, it is important to consider these factors together and evaluate their effect on the prospective teachers' career.

REFERENCES

Büyüköztürk, Ş. (2013). *Data analysis handbook for social sciences*. Ankara: Pegem

Crocker, L., & Algina, J. (1986). *Introduction to classical and modern test theory*. New York: Holt, Rinehart and Winston, Inc.

Çiftçi, S. (2006). *The effect of project-based learning to the student's level of taking academic risk, ability of problem solving, student achievement, retention of learned things and attitude of the students for teaching social studies* (Unpublished doctoral dissertation). Selçuk University, Konya, Turkey.

Cumming, J., Woodcock, C., Cooley, S. J., Holland, M. J., & Burns, V. E. (2014). Development and validation of the groupwork skills questionnaire (GSQ) for higher education. *Assessment & Evaluation in Higher Education, 40*(7), 988-1001.

Ercikan, K., & Oliveri, M. E. (2016). In search of validity evidence in support of the interpretation and use of assessments of complex constructs: Discussion of research on assessing 21st century skills. *Applied Measurement in Education, 29*(4), 310-328. doi: 10.1080/08957347.2016.1209210

Eren, A. (2009). Examining the teacher efficacy and achievement goals as predictors of Turkish student teachers: Conceptions about teaching and learning. *Australian Journal of Teacher Education, 34*(1), 69-87. doi: 10.14221/ajte.2009v34n1.6

Fook, C. Y., & Sidhu, G. K. (2010). Authentic assessment and pedagogical strategies in higher education. *Journal of Social Sciences, 6*(2), 153-161.

Fraenkal, J. R., & Wallen, N. E. (2008). *How to design and evaluate research in education* (7th Edition). New York: McGraw Hill.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2009). *Multivariate data analysis* (7th edition). New Jersey: Pearson Prentice Hall.

Hashweh, M. Z. (1996). Effects of science teachers' epistemological beliefs in teaching. *Journal of Research in Science Teaching, 33*(1), 47-63. doi: 10.1002/(SICI)1098-2736(199601)33:1<47::AID-TEA3>3.0.CO;2-P

Karakuş, F. (2006). *The effect of constructivist learning and authentic assessment approach on social studies teaching students' academic achievement retention and attitudes towards social studies* (Unpublished doctoral dissertation). Çukurova University, Adana, Turkey.

Kelleghan, T., Greaney, V., & Murray, T. S. (2009). *Using the results of a national assessment of educational achievement*. Washington: World Bank.

Kimsesiz, F. (2017). *The effect of project based learning in teaching English language to children in preschool education*. (Unpublished doctoral dissertation). Atatürk University, Erzurum, Turkey.

Kinay, İ., & Bağçeci, B. (2016). The investigation of the effect of the authentıc assessment approach on prospectıve teachers' cooperative decision-making willingness. *International Periodical for the Languages, Literature and History of Turkish, 11*(9), 513-524. doi:10.7827/TurkishStudies.9548

Kinay, İ. (2018). Investigation of prospective teachers' beliefs toward authentic assessment. *World Journal of Education, 8*(1), 75-85. https://doi.org/10.5430/wje.v8n1p75

Korkmaz, H., & Kaptan, F. (2002). The effects of project-based learning on elementary school students' academic achievement, academic self concepts and study time in science education. *Hacettepe University Journal of Education Faculty, 22*, 91-97.

Kutlu, Ö., Doğan, D., & Karakaya, İ. (2014). *Measurement and assessment: Assessment based on portfolio and assessment*. Ankara: Pegem.

Lee, T. S. O., & Lin, S. Y. (2019). English teachers' uses of motivational strategies beyond an established framework. *Educational Research, 61*(4), 451-468. doi: 10.1080/00131881.2019.1677170

Mislevy, R. J. (2007). Validity by design. *Educational Researcher, 36*(8), 463-469. doi: 10.3102/0013189X07311660

Mohamed, R., & Lebar, O. (2017). Authentic assessment in assessing higher order thinking skills. *International Journal of Academic Research in Business and Social Sciences, 7*(2), 466-476. doi: 10.6007/IJARBSS/v7-i2/2021

Morris, R. V. (2001). Drama and authentic assessment in social studies classroom. *Social Studies, 92*(1), 41-44.

Nespor, J. (1987). The role of beliefs in the practice of teaching. *Journal of Curriculum Studies*, *19*(4), 317–328. doi: 10.1080/0022027870190403

Olfos, R., & Zulantay, H. (2007). Reliability and validity of authentic assessment in a web based course. *Educational Technology & Society*, *10*(4), 156-173.

Osmanoglu, A. (2016). Prospective teachers' teaching experience: Teacher learning through the use of video. *Educational Research, 58*(1), 39-55. doi: 10.1080/00131881.2015.1117321

Ozan, C. (2018). Turkish adaptation of groupwork skills questionnaire. *Ankara University Journal of Faculty of Educational Sciences, 51*(3), 1-17. doi: 10.30964/auebfd.475020

Salvucci, S., Walter, E., Conley, V., Fink, S., & Saba, M. (1997). Measurement error studies at the National Center for Education Statistics (NCES). Washington D. C.: U. S. Department of Education.

Postholm, M. B. (2012). Teachers' professional development: A theoretical review. *Educational Research, 54*(4), 405-429. doi: 10.1080/00131881.2012.734725

Savuran, D. (2007). *An effect of project based learning model on the success attitude permanence of teaching seventh grade mathematics* (Unpublished master thesis). Balıkesir University, Balıkesir, Turkey.

Schildkamp, K. (2019). Data-based decision-making for school improvement: Research insights and gaps. *Educational Research, 61*(3), 257-273. doi: 10.1080/00131881.2019.1625716

Seo, T., Kanda, T., & Fujikoshi, Y. (1995). The effects of nonnormality on tests for dimensionality in canonical correlation and MANOVA models. *Journal of Multivariate Analysis*, *52*, 325–337. doi: 10.1006/jmva.1995.1017

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th Edition). Boston: Person Education.

Vanderbilt, K. L. (2008). *Online professional development: an analysis of instructor beliefs and instructional strategies for the facilitation of learning with adult educators* (Unpublished doctoral dissertation). Georgia State University, United States.

Waternaux, C. M. (1976). Asymptotic distribution of the sample roots for a nonnormal population. *Biometrika, 63*(3), 639–645. doi: 10.1093/biomet/63.3.639

Waters-Adams, S. (2006). The relationship between understanding of the nature of science and practice: The influence of teachers' beliefs about education, teaching and learning. *International Journal of Science Education*, *28*(8), 919–944. doi:10.1080/09500690500498351

Wiggins, G. (1990). The case for authentic assessment. *Practical Assessment, Research & Evaluation, 2*(2). Retrieved from http://PAREonline.net/getvn.asp?v=2&n=2.