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Research Article

The Role of Students' Perceptions of Assessment Tasks in Science Classes in Predicting Their Perception of the Classroom Assessment Environment

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Abstract
Assessment practices shape how students experience learning, interpret classroom expectations, and respond to instructional processes. In science education, assessment tasks are especially important because they can direct students either toward learning-focused engagement or toward performance-based comparison. Against this background, the present study examined middle school students' perceptions of classroom assessment environments and assessment tasks in science classes. It also investigated whether these perceptions varied according to gender and whether students' views of assessment tasks predicted their perceptions of learning-oriented and performance-oriented assessment environments. The study was conducted using a correlational survey design. Participants were 2,277 students studying in Grades 6, 7, and 8 in the central district of a province in Türkiye. Data were gathered through the Perceptions of the Classroom Assessment Environment Scale and the Perceptions of Assessment Questionnaire. Descriptive statistics, dependent samples *t*-test, Friedman test, MANOVA, Pearson correlation analysis, and multiple regression analysis were used to analyze the data. The results indicated that students perceived their classroom assessment environment as more performance-oriented than learning-oriented. Perceptions of assessment tasks also varied significantly across dimensions; authenticity had the highest mean score, whereas congruence with planned learning had the lowest. Significant gender differences were observed in both the classroom assessment environment and assessment task perceptions, but the effect sizes were limited. Regression results showed that positive perceptions of assessment tasks predicted learning-oriented assessment environments positively and performance-oriented environments negatively. Overall, the findings indicate that assessment tasks designed to be meaningful, transparent, authentic, and responsive to students may support more learning-oriented assessment environments in science classes.

Keywords: Assessment Task, Science Course, Classroom Assessment Environment

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1. INTRODUCTION

Assessment practices, being an essential component of the instructional process, are commonly utilized by teachers to monitor and guide their teaching efforts (Linn, 1990). Assessment practices are carried out in order to determine the effectiveness of the activities in the learning and teaching process and to give feedback on the inputs and outputs to the system. For this purpose, quantitative and qualitative data collected from students are analyzed and interpreted (Cizek, 1997; McMillan, 1997). Students develop perceptions in accordance with the assessment activities that teachers have carried out in their classes for different purposes and forms. In this context, teachers' assessment practices create an assessment

"environment" or "character" perceived by students for each class (Brookhart, 1997). Students have general perceptions of this environment, which is called the classroom assessment environment (CAE) (Brookhart & DeVoge, 1999). Recent studies emphasize that CAE is shaped not only by pedagogical intentions but also by systemic limitations such as teacher training, institutional policy, and workload (Desie et al., 2025; Özer Özkan & Ozkan, 2025).

There is a close relationship between assessment and teaching processes in students' meaningful learning (Alt, 2018). The assessment types applied in the classroom are critical in creating student-centered learning environments (Sluijsmans et al., 1998). Formative assessments play an important role in creating a supportive classroom climate (Pinger et al., 2018). According to Fraser (1998), the classroom learning environment encompasses the social, physical, psychological, and instructional conditions that shape learning experiences and impact students' achievement and attitudes. The classroom as a learning environment, it is characterized by its structural features (e.g., class size, course duration) and aspects of teaching quality (Pinger et al., 2018). McMillan (2010) suggests that multiple elements of teaching quality, including the classroom climate, play a crucial role in shaping the effectiveness of assessment practices. The fact that the two subscales of the Constructivist-Oriented Learning Environment Survey (COLES) (Aluri & Fraser, 2019), which are widely used in determining students' perceptions of the classroom learning environment, are directly related to assessment applications shows the strong relationship between assessment practices and classroom learning environment. In addition, classroom assessment is undergoing a transformation globally with the integration of digital tools and policy-driven reforms, which alter how feedback, monitoring, and assessment design are implemented (Babatimehin et al., 2025; Orim et al., 2025). Based on this, CAE can be considered as a sub-component of the classroom learning environment. However, the concept of CAE focuses on more narrow and direct assessment activities compared to the learning environment. In addition, Brookhart (2004) argues that the CAE reflects the instructional process in the classroom.

The notion of the Classroom Assessment Environment (CAE) was initially introduced into the academic literature by Stiggins and Conklin (1992). The classroom assessment environment (CAE) was later redefined by Brookhart (1997) based on theoretical perspectives in assessment and motivation. It is understood as the environment perceived by students, shaped by various teacher-related factors including attitudes, assessment goals and tasks, performance standards, feedback practices, and outcome monitoring. Different types of CAE are perceived by students based on teachers' different assessment practices. When the relevant literature is examined (Alkharusi, 2007; Church et al., 2001; McMillan & Workman, 1998), although the types of CAE are classified in different ways, they are generally categorized into two groups in many studies conducted in recent years. These are called "learning-oriented" and "performance-oriented" (Alkharusi, 2009; Cheng et al., 2015).

In the general sense, the learning-oriented assessment environment (LOAE) represents an assessment environment that focuses on improving students' performance and is based on how much students learned about the subject rather than the grade they received during the assessment process. Evidence from both Türkiye and other developing contexts suggests that classroom assessment environments tend to be perceived more as performance-oriented due to institutional priorities and exam-driven education systems (Özer Özkan & Ozkan, 2025).On the other hand, a performance-oriented assessment environment (POAE) is an assessment environment in which the students' grade is important rather than learning, and a comparison is made between the performances of the students through their grades (Alkharusi, 2011). While in a LOAE, the main purpose of assessment applications is to improve the learning levels of students, in a POAE, the main purpose is to determine the learning levels of students. Accordingly, while it is seen that in the LOAE the understanding of "assessment for learning" is prevalent, in the POAE the understanding of "assessment of learning" is prevalent (Buldur, 2014b).

PCAE (perceptions of the classroom assessment environment) change with different practices that teachers perform in their lessons, and one of the most important components of classroom assessment practices is the assessment tasks assigned to students. Assessment tasks assigned to students in the CAE and students' motivations for these tasks affect their perceptions of the assessment tasks (POAT) (Brookhart & Bronowicz, 2003). In this context, students develop opinions about how they are evaluated, and these opinions affect their motivation for the lesson (Buldur, 2014a; Dorman & Knightley, 2006). According to McMillan and Workman (1998), teachers can enhance student motivation through various assessment strategies. These include making assessment expectations transparent, using real-life-related

tasks, informing students in advance about assessment criteria, applying a variety of assessment techniques, and providing constructive feedback following the assessment process. Similarly, Cavanagh et al. (2005), who emphasized that students' perceptions of assessment tasks (POAT) have a significant impact on their motivation, developed a scale to determine POAT. In this scale, they identified five dimensions. These dimensions are: "congruence with planned learning (CWPL)", "authenticity (AUT)", "student consultation (SC)", "transparency(TRAN)", and "accommodation of student diversity (ASD)".

1.1. Purpose of Study

In light of the theoretical explanations, it can be said that students' perceptions of assessment have important effects on many cognitive and affective characteristics of them, and teachers' assessment practices provide students with these perceptions (Ames, 1992; Brookhart, 1997). Students' perceptions of assessment activities conducted under the teacher's control within the classroom are significant. These activities affect many characteristics of students, such as motivational beliefs (Alkharusi, 2009), achievement-goal orientations (Church et al., 2001; Wang, 2004), attitudes towards school (İlhan, 2017), perceptions of the metacognitive-oriented classroom learning environments (Buldur & Baygül, 2018), and academic burnout (İlhan & Çetin, 2014).

When the relevant literature is analysed, it becomes clear that many studies have examined students' PCAE (Alkharusi, 2011; Alkharusi, 2012; Buldur & Doğan, 2014; Church et al., 2001; İlhan, 2017; Wang, 2004). However, although the concept of CAE has been studied in the literature for many years (Alkharusi, 2007; Alkharusi, 2009; Brookhart, 1997; Stiggins & Conklin, 1992; Wang, 2004), it has only been discussed in Turkey in recent years, with only a few studies having been conducted (Buldur, 2014a; Buldur & Baygül, 2018; Buldur & Doğan, 2014; İlhan, 2017). It is therefore thought that this research will contribute to the existing literature.

Recently, classroom assessment has been experiencing significant shifts due to emerging trends in educational technology, formative practices, and policy-oriented reforms. According to Desie et al. (2025), the implementation of classroom assessment in secondary education continues to be influenced by teachers' beliefs, institutional support, and pedagogical challenges, especially in developing contexts. Similarly, Orim et al. (2025) emphasize that technology acceptance, particularly the perceived ease of use and usefulness, directly affects the integration of automated assessment tools, reshaping how assessment is planned, delivered, and interpreted. In line with this, Babatimehin et al. (2025) underline the importance of school-based assessment (SBA) as a holistic evaluation framework that emphasizes formative feedback and student development, yet highlights persistent issues such as inadequate teacher training and systemic implementation gaps. These contemporary insights broaden the scope of classroom assessment by linking it not only to instructional quality and student motivation but also to digital transformation and policy alignment.

Many studies in the literature have also examined POAT (Alkharusi, 2012; Brookhart & DeVoge, 1999; Cavanagh et al., 2005; Dhindsa et al., 2007; Gao, 2012). However, there are very few studies examining the students' POAT in Turkey (Buldur, 2014a; Cakan, 2011). Moreover, one of these studies (Buldur, 2014a) was carried out with middle school students, while the other was carried out with university students (Cakan, 2011). In this direction, it is thought that the study is important in terms of providing new information on the relevant subject.

When relevant literature is examined, the students' PCAE and assessment tasks as separate topics were studied; however, there is a limited number of studies examining the relationship between students' PCAE and assessment tasks (Alkharusi et al., 2014; Cheng et al., 2015). However, it is noteworthy that there is no study examining the relationship between students' PCAE and their POAT in Turkey.

Therefore, the aim of this research is to examine the relationship between middle school students' perceptions of the CAE and their POAT, in relation to continuing their education in Turkey. The study's research question is as follows:

1. Is there a significant difference between the sub-dimensions of students' PCAE?
2. Do students' perceptions of the CAE differ significantly in terms of gender?

3. Is there a significant difference between the students' perception of sub-dimensions regarding the assessment tasks?
4. Do students' perception scores of assessment tasks differ significantly in terms of gender?
5. How do students' PCAE relate to their POAT?

2. METHODOLOGY

2.1. Research Design

This study was structured within a correlational survey framework. This design was considered appropriate because the study focused on identifying the relationships between PCAE and their POAT, without any experimental manipulation (Fraenkel & Wallen, 2009).

2.2. Participants

Participants were selected from middle school students in Grades 6, 7, and 8 who were enrolled in schools located in the central district of a province in Türkiye. The approximate age range of the participants was between 11 and 14 years. Criterion sampling was adopted to determine the study group. Accordingly, the study included students who had taken science courses from the same science teacher for at least two semesters. This criterion was adopted to ensure that the students had sufficient experience with the teacher's classroom assessment practices and could therefore provide more consistent PCAE and POAT.

Table 1. Demographic Characteristics of Participants

		n	f (%)
Gender	Girl	1161	50.9
	Boy	1116	49.1
	Total	2277	100
Grade	6th grade	555	24.6
	7th grade	794	34.8
	8th grade	928	40.6
	Total	2277	100

As shown in Table 1, the gender distribution of the participants was relatively balanced. In addition, the participants were distributed across the 6th, 7th, and 8th grade levels, with the highest proportion of students enrolled in the 8th grade.

2.3. Research Instruments

In this study, the "Students' PCAE Scale" (SPCAES), developed by Alkharusi (2011) and adapted into Turkish by Buldur (2014a), was used to determine the participants' perceptions of the CAE within the scope of the science course. The SPCAES consists of 15 five-point Likert items and measures two dimensions: LOAE and POAE. The response categories range from 1 = strongly disagree to 5 = strongly agree. In the present study, the overall internal consistency coefficient for the SPCAES was .74.

The Students' Perceptions of Assessment Questionnaire (SPAQ) was employed to assess how students perceived the assessment tasks used in science classes. This instrument was originally developed by Cavanagh et al. (2005) and later adapted into Turkish by Buldur (2014a). The SPAQ consists of 24 items and five factors: TRAN, AUT, SC, CWPL, and ASD. It is a four-point Likert-type questionnaire, with response categories scored as 1 = always, 2 = often, 3 = sometimes, and 4 = almost never. The SPAQ yielded an overall internal consistency coefficient of .88 in this study.

The possible total scores range from 15 to 75 for the SPCAES and from 24 to 96 for the SPAQ. For the SPCAES, scores are interpreted separately for the LOAE and POAE factors. Higher scores on each factor indicate stronger perceptions of the corresponding assessment environment type. For the SPAQ, lower scores indicate more frequent perceptions of assessment task characteristics, as the response categories range from 1 = always to 4 = almost never.

Both instruments included negatively worded items. Before the statistical analyses, these items were reverse-scored so that all items were coded in the same direction and the total and subscale scores could be interpreted consistently. The administration of the instruments took about 15 to 20 minutes.

2.4. Data Analysis

Information on the statistical techniques used in the analyses is given in Table 2.

Table 2. Information on The Statistical Techniques Used in the Analysis

Scales	Factors	Differences Between Factors	Gender	Relationship Between Two Scales
SPAQ	CWPL AUT SC TRAN ASD	Friedman Test	MANOVA	Multiple Regression Analysis
SPCAES	LOAE POAE	Dependent Samples t-test	MANOVA	

As seen in Table 2, quantitative data were analyzed using IBM SPSS Statistics version 25, and the significance level for hypothesis testing was set at $p < .05$. The dependent samples t-test was used to determine whether students' PCAE differed significantly according to the types of assessment environments, while the Friedman test was used to determine whether their POAT differed significantly across sub-dimensions. MANOVA, one of the multivariate statistical techniques, was conducted to examine whether students' PCAE and POAT differed significantly in terms of gender. Lastly, multiple regression analysis was employed to investigate the relationship between students' PCAE and their POAT.

3. RESULTS

3.1. Findings Related to the Students' PCAE

The normality assumption was tested before the analyses to determine whether the students' PCAE differed according to the learning and POAE types. Kolmogorov-Smirnov test was performed, and skewness- kurtosis coefficients were examined in order to test the assumption of normality. A dependent samples t-test was applied to determine significant differences in students' mean scores related to types of CAE perceptions, given that the assumption of normal distribution was fulfilled. Table 3 shows the findings from the dependent samples t-test examining the significance of differences in students' mean scores across CAE types.

Table 3. Dependent Samples T-Test Results of Students' Mean Scores for Classroom Assessment Environment Types

	Group	n	M	SD	df	t	*p*
SPCAES	LOAE	2277	2.12	0.63	2276	50.77	<.001
	POAE	2277	3.34	0.78			

As shown in Table 3, the dependent samples t-test revealed a significant difference between LOAE (M = 2.12) and POAE (M = 3.34) [$t(2276) = 50.77$, $p < .05$]. The effect size ($d = 1.06$) indicates a large difference (Green & Salkind, 2005). The situation shows that students perceive the CAE as more POAE.

3.2. Gender-Based Differences in SPCAES Scores: Findings

Prior to conducting the MANOVA to examine gender-based differences in SPCAE, test assumptions were evaluated. Normality was checked through the Kolmogorov-Smirnov test and the distributional indicators of skewness and kurtosis. The results indicated that the assumption of normal

distribution was satisfied. In addition, Mahalanobis distances were examined to test the multivariate normality assumption, and it was observed that there was no extreme value disrupting the multivariate normality. The MANOVA test was performed because the necessary assumptions were provided as a result of the Levene F test result for the homogeneity of variances assumption (p>.05) and the Box M test for the equality of covariance matrices (Box M =10.97, p >.05). The distribution of the average scores of the students' perceptions regarding the types of CAE in terms of gender is shown in Table 4.

Table 4. The Average Scores of SPCAE Types in Terms of Gender

SPCAES	Categories of Scale	Boy			Girl			Total		
		n	M	SD	n	M	SD	n	M	SD
	POAE	1116	3.21	0.79	1161	3.46	0.75	2277	3.34	0.78
	LOAE	1116	2.20	0.64	1161	2.04	0.61	2277	2.12	0.63

Based on the data in Table 4, the MANOVA test was conducted to determine whether the average scores related to the participants' perceptions of CAE types differ according to their genders. The MANOVA results revealed a statistically significant gender-based difference in students' average scores for CAE types (Wilks' Lambda = 0.97, $F(2, 2274) = 37.76$, $p < .05$, $\eta^2 = .03$). A pair-wise multiple comparison test was performed to determine which factors differed significantly. According to the test result, it was concluded in terms of gender that LOAE scores differed significantly in favor of male students, while POAE scores differed significantly in favor of female students (p<.05). Based on the calculated effect size, gender had a small impact on students' perceptions of the CAE (Pallant, 2007).

3.3. Findings on the Students' POAT

Descriptive information about the sub-dimensions of students' POAT is demonstrated in Table 5.

Table 5. Descriptive Information on the Sub-Dimensions of POAT

	Categories of the Scale	Total		
		n	M	SD
SPAQ	CWPL	2277	1.86	0.57
	SC	2277	1.96	0.59
	AUT	2277	2.04	0.60
	TRAN	2277	1.97	0.60
	ASD	2277	1.93	0.60

As can be viewed in Table 5, it stands out that there are differences between the average scores of the participants regarding the sub-dimensions of their perceptions about the assessment tasks. A one-way analysis of variance test (ANOVA) was planned for repeated measurements in order to examine whether these score differences were significant or not; however, the assumption of sphericity, which is one of the assumptions to be provided for this analysis, could not be met according to the result of the Mauchly test (p<.05). Therefore, differences among the repeated measurements were examined using the Friedman test.

The scores of the students regarding the sub-dimensions of the POAT are in order from low to high: CWPL (M=1.86), ASD (M=1.93), SC (M=1.96), TRAN (M=1.97), and AUT (M=2.04). When the average scores are examined, it is observed that the mean score of the AUT dimension is higher than the other dimensions. Friedman was used to determine whether this difference was significant or not. The results of the Friedman test indicated significant differences among the sub-dimensions of POAT [$\chi^2(4, N = 2277) = 220.024$, $p < .05$]. To identify which dimensions differed significantly according to the Friedman test results, the Wilcoxon signed-rank test and pairwise comparisons were conducted. Significant differences were found between the average scores of the following dimensions in the paired comparisons, and the differences in the other paired comparisons were not found to be significant. Accordingly, pairwise comparisons revealed significant differences in the following cases:

- in favor of the AUT factor between the average scores of the AUT dimension and the other four dimensions (p<.05)
- against the factor of CWPL between the average score of the CWPL dimension and the other four dimensions (p<.05)
- in favor of the SC dimension between the average score of the SC dimension and the ASD dimension (p<.05)
- in favor of the TRAN factor between the average score of the TRAN dimension and the ASD dimension (p<.05).

3.4. Findings on the Differences Between Gender in Students' POAT

Before the MANOVA test, which was planned to determine whether students' POAT assessment tasks differed in terms of gender or not, the assumptions of the test were examined. Accordingly, preliminary analyses were conducted to evaluate whether the data met the normality assumption. The Kolmogorov-Smirnov test results and the skewness-kurtosis coefficients indicated that the distribution was within acceptable limits. In addition, Mahalanobis distances were examined to test the multivariate normality assumption, and values that disrupted the multivariate normality (17 individuals exceeding the critical value of 15.08) were excluded from the analysis by applying the Mahalanobis correction. The MANOVA test was performed because the necessary assumptions were provided as a result of the Levene F test result (p>.05) for the homogeneity of variances assumption and the Box M test for the equality of covariance matrices (Box M =29.37, p>.05). Table 6 presents the distribution of students' average scores on their POAT by gender.

Table 6. The Average Scores Related to the Students' POAT According to Gender

Categories of the Scale		Boy			Girl			Total		
		n	M	SD	n	M	SD	n	M	SD
SPAQ	CWPL	1102	1.94	0.55	1158	1.77	0.54	2260	1.86	0.55
	SC	1102	2.07	0.59	1158	1.87	0.56	2260	1.95	0.58
	AUT	1102	2.10	0.60	1158	1.97	0.57	2260	2.04	0.59
	TRAN	1102	2.05	0.59	1158	1.89	0.58	2260	1.97	0.59
	ASD	1102	1.99	0.58	1158	1.86	0.58	2260	1.93	0.58

Based on the data in Table 6, as a result of the MANOVA test, it was determined that there was a significant difference between the average scores of the sub-dimensions of perceptions about assessment tasks in terms of gender (Wilks' Lambda=0.97; F(5.2254)=12.41; p< .05; η^2=.03). Results from the pairwise multiple comparisons indicated statistically significant differences across all sub-dimensions in favor of male students (p < .05). Despite these differences, the effect size suggested that gender exerted only a minor influence on students' POAT sub-dimensions (Pallant, 2007).

3.5. Relationship Between SPCAES and POAT

Multiple regression analysis was conducted in order to reveal the extent to which POAT was perceived to have an impact on their perceptions about the SPCAE. Prior to the multiple regression analysis, test assumptions were evaluated. To assess normality, the Kolmogorov-Smirnov test was conducted, and skewness-kurtosis values were examined. The results confirmed that the assumption of normal distribution was satisfied. In addition, Mahalanobis distances were examined to test the multivariate normality assumption, and values that disrupted the multivariate normality assumption (54 individuals exceeding the critical value of 15.08) were excluded from the analysis by applying the Mahalanobis correction. Furthermore, the relationships between the sub-dimensions of students' perceptions about the CAE and POAT were examined for the multiple connectedness assumption. Table 7 presents the correlation results for the relationships between students' PCAE and POAT.

Table 7. Findings on the Relationships Between SPCAES and POAT

		1	2	3	4	5	6	7
SPAQ	CWPL	1						
	SC	.58*	1					
	AUT	.56*	0.57*	1				
	TRAN	.62*	.63*	.54*	1			
	ASD	.58*	.63*	.58*	.59*	1		
SPCAES	6. POAE	-.30*	-.28*	-.22*	-.25*	-.28*	1	
	7. LOAE	.48*	.49*	.46*	.46*	.47*	-.31*	1

(*) p<.05

Table 7 shows that the correlations among the predictor variables did not exceed .80. The multicollinearity diagnostics also supported this result, as all VIF values were below 10 and all tolerance values were higher than .20. Based on these indicators, the multicollinearity assumption was considered to be satisfied (Field, 2005), and multiple regression analysis was subsequently performed.

3.5.1. Findings on the Relationship Between Students' Perceptions of the LOAE and their POAT

The multiple regression analysis results regarding the perceptions of the LOAE are demonstrated in Table 8.

Table 8. The Results of the Multiple Regression Analysis Indicating the Relationship Between LOAE Perceptions and Assessment Tasks

LOAE						
Variable		**B**	**Standard Error**	**ß**	**T**	**p**
SPAQ	Constant	0.63	0.05	-	13.74	<.001
	CWPL	0.20	0.03	.18	7.09	<.001*
	SC	0.19	0.03	.17	6.63	<.001*
	AUT	0.14	0.03	.13	5.60	<.001*
	TRAN	0.10	0.03	.09	3.59	<.001*
	ASD	0.14	0.03	.13	5.09	<.001*

Table 8 reports the multiple regression results regarding the predictive role of assessment task variables in LOAE. The findings indicated that ASD, SC, AUT, CWPL, and TRAN were collectively significantly related to LOAE perceptions (R = .579, R^2 = .336, $F(5, 2217) = 213.88$, $p < .05$), explaining 34% of the variance. Based on standardized coefficients, all predictors were statistically significant ($p < .05$), with CWPL (β = .18), SC (β = .17), AUT (β = .13), ASD (β = .13), and TRAN (β = .09) contributing positively to LOAE perceptions. According to the regression analysis, the equation predicting LOAE perceptions is as follows:

Perception of Learning-Oriented Assessment Environment Score =

(0,20 x Score of Congruence with the Planned Learning Dimension) + (0,19 x Score of Student Consultation Dimension) + (0,14 x Score of Authenticity Dimension) + (0,10 x Score of Transparency Dimension) + (0,14 x Score of Accommodation of Student Diversity Dimension) + (0,63)

3.5.2. Findings on the Relationship Between Students' Perceptions of the POAE and Their POAT

The findings on multiple regression analysis regarding the perceptions of the POAE are demonstrated in Table 9.

Table 9. The Multiple Regression Results for Predicting POAE from Assessment Task Variables

		POAE				
	Variable	**B**	**Standard Error**	**ß**	**t**	**p**
SPAQ	Constant	4.40	0.07	-	63.86	<.001
	CWPL	-0.24	0.04	-.16	-5.54	<.001*
	SC	-0.15	0.04	-.11	-3.59	<.001*
	AUT	0.01	0.04	.01	0.03	.98
	TRAN	-0.04	0.04	-.03	-0.10	.32
	ASD	-0.13	0.04	-.10	-3.30	<.001*

Table 9 summarizes the regression model predicting POAE from students' perceptions of assessment task variables. The findings indicated that AUT, SC, ASD, CWPL, and TRAN were collectively significantly related to POAE perceptions ($R = .334$, $R^2 = .112$, $F(5, 2217) = 53.27$, $p < .05$), explaining approximately 11% of the variance. Based on standardized coefficients, CWPL ($\beta = –.16$), SC ($\beta = –.11$), and ASD ($\beta = –.10$) were significant predictors ($p < .05$), whereas AUT ($\beta = .01$) and TRAN ($\beta = –.03$) were not statistically significant.

According to the regression analysis, the equation predicting POAE perceptions is as follows:

Perception of Performance Oriented Assessment Environment Score=
-0,24 x The Score of Congruence with the Planned Learning) + (-0,15 x The Score of Student Consultation) + (0,01 x The Score of Authenticity) + (-0,04 x The Score of Transparency) + (-0,13 x The Score of Accommodation of Student Diversity) + (4,402)

4. DISCUSSION

The first research question addressed SPCAES by comparing their LOAE and POAE scores. Findings revealed that the classroom assessment environment was significantly perceived by participants as being oriented toward performance. In a similar study conducted with high school students, İlhan (2017) determined parallel results that the participants generally perceived the CAE as POAE. In contrast to the current findings, previous research has suggested that participants tend to view the classroom assessment environment as predominantly LOAE (Alkharusi, 2007; Buldur, 2014a; Church et al., 2001; Wang, 2004).

When the relevant literature is investigated, it was determined that the participants perceived the CAE as more POAE than in this study (İlhan, 2017), while in some studies it was concluded that they perceived it as more LOAE (Alkharusi, 2007; Alkharusi, 2009; Buldur, 2014a; Wang, 2004). As possible reasons for this difference between studies, it can be considered that the countries where the studies are conducted are different, the participant groups in which the study are different (secondary school, high school, university), or the assessment practices of the teachers are different. It can be said that new studies based on different research designs are needed in order to investigate the reasons for these differences in depth.

In response to the second research question, gender-based differences in students' perceptions of the CAE were explored. The results indicated that girls predominantly perceived the environment as performance-focused, whereas boys associated it more with an LOAE approach. In many studies, different from the results obtained in the research, in students' PCAE, significant differences were found in favor of male students in the POAE type (Alkharusi, 2011; Alkharusi, 2015; Buldur, 2014b), and in favor of female students in the LOAE type (Alkharusi, 2011; Alkharusi, 2015). In addition, in the study of Buldur (2014b), it was determined that the perceptions of the LOAE did not differ significantly according to gender. As a result of this study, the average scores of the students regarding the types of CAE in terms of gender were determined to be that the perceptions of the LOAE differed in favor of boys, and the perceptions of the POAE in favor of girls. Although statistically significant gender-based differences were found, these findings should be interpreted cautiously because the effect size was small. Therefore, effect size values should be considered together with p values when interpreting the practical importance of findings (Field, 2005; Pallant, 2007). In the present study, the mean scores of boys and girls were relatively close to each

other, and the effect size value was small (η^2 = .03), suggesting that the practical impact of gender on students' perceptions of the classroom assessment environment was limited.

The third research question examined variation in students' POAT scores across sub-dimensions. The findings indicated that students' perceptions differed statistically across these dimensions.

In line with the present findings, Cakan (2011), in a study conducted with university students, found that the POAT sub-dimensions were ranked in the following order based on average scores: awareness, SC, CWPL, TRAN, and ASD. There is a partial parallelism between the findings obtained in Cakan's (2011) study and the results of this research. As a result of this study, the students' perception average scores for the assessment tasks are from the highest to the lowest, respectively, AUT, SC, TRAN, ASD, and CWPL; while in Cakan's (2011) study, there is a difference in the order of the dimensions of ASD and CWPL. The relatively higher score for AUT is noteworthy because authentic assessment tasks can help students connect assessment activities with meaningful, real-life learning contexts. Gulikers et al. (2006) reported that students' perceptions of assessment AUT and alignment were associated with deeper learning and the development of generic skills.

In the fourth research question, it was aimed to determine whether the students' POAT differed according to gender. According to result analyzes, it was determined that the boys' POAT in all dimensions were higher than the girls' POAT. In parallel with the result obtained in this study, Cakan (2011) found in his study that boys have higher perceptions about assessment tasks compared to girls. Unlike the findings obtained in this study, in their study, Dhindsa et al. (2007) examined the relationship between POAT and gender. They reported a significant difference in the CWPL factor in favor of female students, while a significant difference was observed in the SC factor in favor of male students. However, no significant differences in gender were found in the dimensions of AUT, TRAN, and ASD. Similarly, Gao (2012) found that there was a significant difference in the POAT. Similar to the present findings, boys had significantly higher scores in the AUT dimension. In contrast, the same study reported a significant difference in the TRAN dimension in favor of girls, which differs from the results of the present study. On the other hand, it was found that there was no significant gender difference in some dimensions (ASD, CWPL, and SC) of POAT. In a study with different results, Alkharusi (2012) found that POAT did not differ significantly in terms of gender. Again, Alkharusi et al. (2014) found significant gender differences in the dimensions of CWPL, AUT, SC, and TRAN, all favoring female students. However, ASD scores did not differ significantly.

Considering the studies examining whether the perceptions of the participants regarding the assessment tasks differ according to gender, it is observed that the studies were conducted with university students (Cakan, 2011) and high school students (Alkharusi, 2012; Dhindsa et al., 2007; Gao, 2012). It is noteworthy that these studies have reached different results. Consistent with the findings of this study, several previous studies have also reported significant gender differences in favor of male students in the AUT dimension (Cakan, 2011; Dhindsa et al., 2007; Gao, 2012), SC (Dhindsa et al., 2007), ASD (Cakan, 2011), TRAN (Cakan, 2011), and CWPL (Cakan, 2011). Diversely, in some studies it was found that significant differences in favor of female students in factors of CWPL (Alkharusi et al., 2014; Dhindsa et al., 2007), TRAN (Alkharusi et al., 2014; Gao, 2012), AUT (Alkharusi et al., 2014), and SC (Alkharusi et al., 2014). Moreover, some studies have indicated that POAT does not vary significantly by gender (Alkharusi, 2012).

When the results obtained in the related studies are examined, it stands out that there is no common conclusion about whether the POAT differ according to their gender. In addition to the studies in which it was found that there was no difference in terms of gender, it was also found that there were differences in favor of boys in some studies and in favor of girls in some studies (Cakan, 2011; Dhindsa et al., 2007). It is thought that these differences in the results of the research may be specifically related to the sample groups in which the studies were carried out, and generally related to the countries where the studies were carried out and the education systems in these countries.

The findings of this study resonate with recent literature underscoring both global and local challenges in implementing effective classroom assessment. For instance, Özer Özkan and Ozkan (2025) revealed that while formative assessment is conceptually accepted by teachers in Türkiye, practical implementation remains inconsistent due to limited professional development and contextual constraints. Similarly, Desie et al. (2025) emphasized that factors such as teacher workload, lack of training, and policy

ambiguities may hinder the effective use of classroom assessments. These findings align with the present study in that the classroom assessment environment is shaped not only by student and teacher perceptions but also by teachers' assessment purposes, feedback practices, instructional decisions, institutional conditions, and broader systemic dynamics (Brookhart, 1997; Desie et al., 2025; Özer Özkan & Ozkan, 2025).

In the fifth research question, it was aimed to determine how and to what extent the dimensions of ASD, CWPL, SC, TRAN, and AUT regarding the POAT predict the perceptions of the CAE. Multiple regression analysis showed that all dimensions of the POAT significantly and positively predicted students' perceptions of the LOAE. In contrast, CWPL, SC, and ASD were found to significantly and negatively predict perceptions of the POAE. This finding generally shows that students' POAT predicts POAE perceptions negatively and LOAE perceptions positively. This pattern is theoretically consistent with the nature of LOAE, which emphasizes meaningful assessment tasks, feedback, student involvement, and improvement of learning rather than merely grading or comparing students (Alkharusi, 2011; Brookhart, 1997; Brookhart & DeVoge, 1999). In this regard, students' positive POAT are expected to be associated with their perceptions of a LOAE, since assessment tasks constitute one of the core components through which students experience and interpret classroom assessment practices (Brookhart, 1997; Brookhart & Bronowicz, 2003; Cavanagh et al., 2005).

In parallel with this result obtained in the research, Alkharusi et al. (2014) determined that POAT predicted perceptions of POAE, in the dimensions of SC and ASD as positively and significantly, and in the dimensions of TRAN, CWPL, and AUT as negatively and significantly. They determined that all dimensions of POAT predict perceptions of LOAE positively and significantly. In another study aiming to determine which POAT predicts perceptions of CAE, Cheng et al. (2015) found that POAT predicts perceptions of the POAE in the dimensions of CWPL, SC, AUT, and TRAN positively and significantly, while it predicts the dimension of ASD negatively and significantly. In addition, they determined that all dimensions of POAT positively and significantly predicted their perceptions of the LOAE.

When we look at the studies investigating the PAOT what extent to predict the PCAE (Alkharusi et al., 2014; Cheng et al., 2015), it was determined that the SC dimension positively predicts the POAE perceptions, while different results were achieved in other dimensions. Furthermore, in both studies, it was determined that all dimensions of POAT positively predicted perceptions of LOAE. In this context, in this study and other studies examining how POAT predicts the types of CAE, different results were found regarding the relationship between perceptions of POAE and POAT. However, the findings were similar with respect to the relationship between students' LOAE perceptions and POAT.

5. RECOMMENDATIONS

The findings of this study have several practical implications for educators, researchers, curriculum developers, and educational stakeholders. For teachers, the results suggest that science classroom assessment environments should be structured in a more LOAE way by using meaningful assessment tasks, providing timely and constructive feedback, clarifying assessment criteria, and involving students in assessment processes. Since students' POAT were found to predict their SPCAES, teachers should design assessment tasks that are authentic, transparent, CWPL, responsive to student differences, and open to SC. For curriculum developers, the findings indicate that assessment-related components of science curricula should emphasize not only grading and achievement monitoring but also formative assessment, student participation, feedback quality, and task AUT. For school administrators and policymakers, the results highlight the need for professional development activities that support teachers' assessment literacy and help them create LOAE assessment cultures. For researchers, the study suggests that future research should examine how classroom assessment environments and assessment task perceptions interact across different grade levels, school contexts, and subject areas.

6. LIMITATIONS AND SUGGESTIONS

In this study, the performance of students in the PCAE and in assessment tasks was investigated only in terms of gender. Other studies on this subject have included different demographic variables in

their research models. Furthermore, students' PCAE and POAT may not fully reflect the assessment practices carried out in the classroom. Future studies may draw on qualitative evidence from interviews and classroom observations to gain a more detailed understanding of how students experience assessment practices.

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