Constructing Teaching Identity in Teacher Education: A DASTT-C Analysis of Prospective Science Teachers

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ABSTRACT

The aim of this research is to reveal how teaching identity is constructed within the context of the teacher education process by examining the mental teaching images of prospective science teachers through the Draw-A-Science-Teacher-Test Checklist (DASTT-C). The research was conducted using a mixed methods design, and the study group consisted of 121 prospective science teachers studying at a state university in Turkey. Data were scored by three independent evaluators; Intraclass Correlation Coefficient (ICC) was calculated for inter-rater reliability, and KR-20 and Cronbach Alpha coefficients were calculated for internal consistency. Non-parametric tests were preferred due to the non-normal distribution. The findings show that the vast majority of participants concentrated in the "mix teaching approach" category. No significant difference was found between the groups in terms of total scores; the effect size remained small. However, a significant relationship was found between teaching approach and the group variable, and this relationship was determined to be at a moderate-to-high level. In the sub-dimension analyses, significant differences were observed, particularly in indicators related to the teacher's positioning in the classroom and the student's role of observing and listening. Informal learning elements were found to be represented at a low level in the drawings. In conclusion, the findings indicate that the teacher training process creates a hybrid and transitional teaching identity rather than directly producing a paradigm shift. It is assessed that teacher identity is shaped within the interaction between macro-level reform discourse, curriculum structure, and individual mental representations.

Keywords: teacher identity, DASTT-C, science education, teaching approach,

INTRODUCTION

In recent years, a strong trend towards student-centered, skill-based, and inquiry-based teaching approaches has been observed in science education. This pedagogical paradigm shift aims to transform the teacher's role from a mere transmitter of information to a guide who designs and directs the learning process. However, the extent to which this trend is reflected in prospective teachers' perceptions of professional identity and their mental images of teaching has not been sufficiently clarified from a theoretical perspective (Akkuş, 2013; Alkış Küçükaydın & Gökbulut, 2020; Feyzioğlu, 2014; Minogue, 2010; Shin & Alpern, 2024). Teacher identity is a dynamic and multi-layered structure that encompasses not only teaching preferences but also the individual's role in the classroom, their interaction with students, and their beliefs about the nature of teaching (Buldur, 2017; Doruk et al., 2017). Therefore, understanding the formation of teacher identity requires revealing how prospective teachers conceptualize teaching. At the micro level, prospective teachers' mental images of teaching can be considered a visible representation of teacher identity. In recent years, drawing-based tools have been used as an effective method to reveal individuals' implicit beliefs and teaching scenarios, going beyond their verbal statements. The Draw-A-Science-Teacher-Test Checklist

(DASTT-C) allows for a systematic analysis of how prospective teachers envision elements such as teacher-student interaction, classroom organization, and teaching emphasis (Thomas et al., 2001; Finson et al., 2006; Minogue, 2010). Recent studies show that drawings can holistically reflect the cognitive and affective dimensions of teacher identity (Shin & Alpern, 2024).

Based on this theoretical framework, this study examines teacher identity in the context of the interaction between macro-level pedagogical orientations, meso-level teacher education structure, and micro-level mental representations; it investigates the teaching images of prospective science teachers through the DASTT-C. In this respect, the study aims to explain how teacher identity is constructed in the teacher education process and how hybrid teaching identity configurations emerge. Although there are numerous studies on prospective science teachers' teaching beliefs and attitudes, a significant portion of these studies are based on self-report scales. The systematic examination of teacher identity through visual and mental representations has remained relatively limited in the literature. In particular, most studies using the DASTT-C remain at a descriptive level; they do not address how teacher identity relates to macro-level pedagogical orientations and the teacher education process within a multi-layered model framework (Finson et al., 2006; Lay et al., 2013). Furthermore, theoretical debates regarding whether teacher identity exhibits a linear transformation process or a hybrid and negotiated construct have not been sufficiently supported at the empirical level.

In the current literature, there are limited studies that systematically examine how pre-service teachers' mental teaching images differ according to program levels and what this differentiation means in terms of teacher identity construction (Uçar, 2012; Buldur, 2017). In particular, revealing the transition, rupture, or restructuring patterns that emerge at different stages of the teacher education process through drawing-based analyses has the potential to make a significant contribution to teacher identity research. In this context, teacher identity should be considered not only through the "student-centered-teacher-centered" dichotomy but also through hybrid and transitional configurations. The main contribution of this study to the literature can be summarized in three dimensions. Firstly, it proposes a multi-layered model by conceptualizing teacher identity within the framework of the interaction between macro-level pedagogical orientations, meso-level teacher education structure, and micro-level mental representations. Secondly, it reveals the micro-indicators of teaching identity by analyzing DASTT-C data not only through total scores but also at the level of sub-dimensions and drawing elements. Thirdly, it opens up a discussion, based on empirical findings, about whether teacher identity development may exhibit a hybrid and negotiated structure rather than a linear paradigm shift.

The main objective of this study is to examine the mental teaching images of prospective science teachers through the DASTT-C tool, to determine the distribution of teaching approaches, to reveal possible differences according to class levels, and to evaluate the findings in the context of teacher identity construction in light of international literature.

METHOD

Research Design

In this research, a mixed methods research design was used to address the mental images of prospective teachers in terms of science teaching in a multifaceted way. Mixed methods involve obtaining, analyzing, and integrating qualitative and quantitative data to better understand the research problems (Creswell, 2014). In this study, the data obtained through the DASTT-C tool were analyzed both qualitatively (content analysis of drawings and written explanations) and quantitatively (statistical analysis of checklist scores). Lay and Khoo (2013) state that studies based on DASTT-C have both a quantitative and qualitative design in terms of data content.

Study Group

The study group of this research consists of 1st, 2nd, 3rd, and 4th-year prospective science teachers studying in the Science Education Department of the Faculty of Education at a state university in Türkiye. Purposive sampling, a non-probability sampling method, was chosen to select the participants. Purposive sampling is a method that allows researchers to consciously select individuals who are most suitable and knowledgeable for the study's objectives (Büyüköztürk et al., 2009). In this context, the inclusion criterion for 3rd and 4th-year students, in particular, was determined as having completed the 6-credit "Science Teaching I and Science Teaching II" courses, in order to examine their professional perceptions and achievements.

Table 1.
Distribution of Participants According to Grade Level

	Frequency	Percent	Valid Percent	Cumulative Percent
1st grade (freshman)	17	14.0	14.0	14.0
2nd grade (sophomore)	25	20.7	20.7	34.7
3rd grade (junior)	33	27.3	27.3	62.0
4th grade (senior)	46	38.0	38.0	100.0
Total	121	100.0	100.0	

The prospective teachers included in this study were examined in two groups based on the content of the courses they took in the Science Education undergraduate program: 1st-2nd year and 3rd-4th year students; information about the groups is given in Table 2. Group 1 includes prospective teachers in the 1st and 2nd years, and Group 2 includes prospective teachers in the 3rd and 4th years. It is observed that in the first two years of the Science Education undergraduate program, prospective teachers are largely focused on basic subject matter knowledge and theoretical course content, and that information and applications regarding the teaching approaches specified within the scope of the Turkish National Teaching Model (TNTM) are addressed at a limited level. In contrast, it is thought that in the 3rd and 4th years, the student-centered, activity-based, and application-oriented teaching approach envisioned by the TNTM is addressed more intensively through courses such as special teaching methods, science teaching laboratory applications, lesson plan preparation studies, and teaching practice for school experience. This situation shows that the perceptions of prospective teachers regarding their teaching roles and classroom teaching approaches may differ between groups; therefore, the participants in the 1st-2nd years... Grouping the students into grades 3 and 4 constitutes the theoretical and program-based foundation of the study.

Table 2.
Distribution of Participants by Group

	Frequency	Percent	Valid Percent	Cumulative Percent
1.Group (freshman + sophomore)	42	34.7	34.7	34.7
2.Group (junior + senior)	79	65.3	65.3	100.0
Total	121	100.0	100.0	

Data Collection Tools

The development process of the Draw-A-Science-Teacher-Test Checklist (DASTT-C) began in 1926 with Goodenough's Draw-A-Man Test, which reflected and validated mental models of drawings; it was adapted to science education in 1957 with Mead and Métraux's definition of scientist stereotypes. In 1983, Chambers' Draw-A-Scientist Test (DAST) was developed as a visualization tool, but the subjective summarization problem was solved in 1995 with Finson, Beaver, and Cramond's DASTT-C Checklist. Pilot tests were conducted by Thomas and Pedersen (1998) by shifting the focus to key points, and interpretation errors were

minimized by adding a narrative section. Finally, in 2001, Thomas, Pedersen, and Finson completed the final 13-item version (reliability α=0.78, r=0.82). This process standardized the instrument when measuring teacher beliefs. Data analysis for the study was conducted using the DASTT-C Scorecard as a reference. Using this method, visual data were converted into numerical values, and the mental images of prospective teachers were grouped according to these numerical values. The prospective teachers' perceptions of teaching were quantitatively grouped under the headings "Teacher-Centered," "Conceptual," and "Student-Centered." This quantitative classification was examined in detail within the contexts of "skill-oriented" and "out-of-school learning" as envisioned by the TNTM.

Implementation Process

During the data collection process, participants were given detailed information about the purpose, scope, and confidentiality of the research. Informed consent forms were obtained from the participants in this voluntary study. After the consent process was completed, the DASTT-C scale was distributed to the participants. Participants were given 20 minutes to complete the DASTT-C scale. In order to protect the personal data of the participants during the application, the collected data was anonymized and the participant's identity was preserved. The identities of the participants were not recorded at any stage, and the data was used only for scientific research purposes.

Data Analysis

The collected DASTT-C plots were scored as 1 (yes) / 0 (no) by three independent evaluators according to a checklist prepared by the researcher. Inter-rater reliability was ensured by calculating the Intraclass Correlation Coefficient (ICC) method, defined by Shrout and Fleiss (1979), to determine the consistency of scoring among the three evaluators. After the scoring was completed, all data were transferred to IBM SPSS 27 Statistics program, and frequency, percentage, mean, and standard deviation values were examined. Then, Shapiro–Wilk and Kolmogorov–Smirnov normality tests were performed to determine the suitability of the distribution. Since normality of the distribution could not be achieved, the Kruskal–Wallis H test and the Mann–Whitney U test were used.

The Chi-Square independence test was applied to examine the relationship between the two independent groups determined in the study and the teaching approaches adopted by prospective teachers (Student-Centered, Blended, Teacher-Centered) and possible differences between the groups. This analysis technique was preferred to determine whether groups formed based on categorical variables exhibited similar or different distributions in terms of a specific characteristic (teaching approach) (Büyüköztürk et al., 2009; Creswell, 2014). In the analysis process, DASTT-C scores were classified according to the scoring key suggested by Thomas et al. (2001); in intergroup comparisons, the expected frequency values and assumptions were checked, and the significance level was accepted as $p < .05$. The findings showed that both groups exhibited a similar trend in terms of teaching approaches, and the difference between them was not statistically significant ($p > .05$).

RESULTS

The consistency of the scores obtained within the scope of the DASTT-C scale was examined using the intraclass correlation coefficient (ICC). As shown in Table 3, the ICC value for the mean measurements was calculated as .881 ($F = 8.407$, $p < .001$). According to the classification proposed by Koo and Li (2016), this value is in the range of .75–.90, indicating a "good level" of reliability. This finding shows that there is a high level of scoring consistency among the three independent evaluators.

Table 3.

Intraclass Correlation Coefficient

	95% Confidence Interval	F Test with True Value 0

	Intraclass Correlationb	Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.712a	.635	.779	8.407	120	240	.000
Average Measures	.881c	.839	.914	8.407	120	240	.000

Since the DASTT-C checklist has a binary (0–1) scoring structure, its internal consistency was evaluated using both Cronbach Alpha and Kuder-Richardson 20 (KR-20) coefficients. For the 13-item scale, the Cronbach Alpha value was calculated as .701 and the KR-20 value as .704 (Table 4). The fact that both coefficients are quite close to each other indicates that the scale has an acceptable level of internal consistency based on the total score.

Table 4.
Internal Consistency Coefficients of the DASTT-C Scale

Reliability Statistics	Value	Items
Cronbach Alpha	.701	13
KR-20	.704	13

The distribution of total scores was examined using the Kolmogorov–Smirnov and Shapiro–Wilk tests (Table 5). In both tests, p-values less than .05 ($p < .01$) indicate that the distribution does not meet the normality assumption. Therefore, non-parametric tests were preferred for group comparisons.

Table 5.
Normality Test of DASTT-C Scores

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Total	.162	121	.000	.958	121	.001

a. Lilliefors Significance Correction

The frequency distribution of the total DASTT'C scores is presented in Figure 1. When examining the scores obtained by prospective teachers from the drawing scale, it is observed that the scores are spread across the entire range (0-13 points). Considering the scores of 121 participants, the most concentrated range is between 8 points (n=22) and 9 points (n=21). According to the classification of Thomas et al. (2001) in the literature, the vast majority of participants fall into the "mix teaching approach" category. The low frequency of extreme scores indicates that the sample is not concentrated in a distinctly extreme teaching approach.

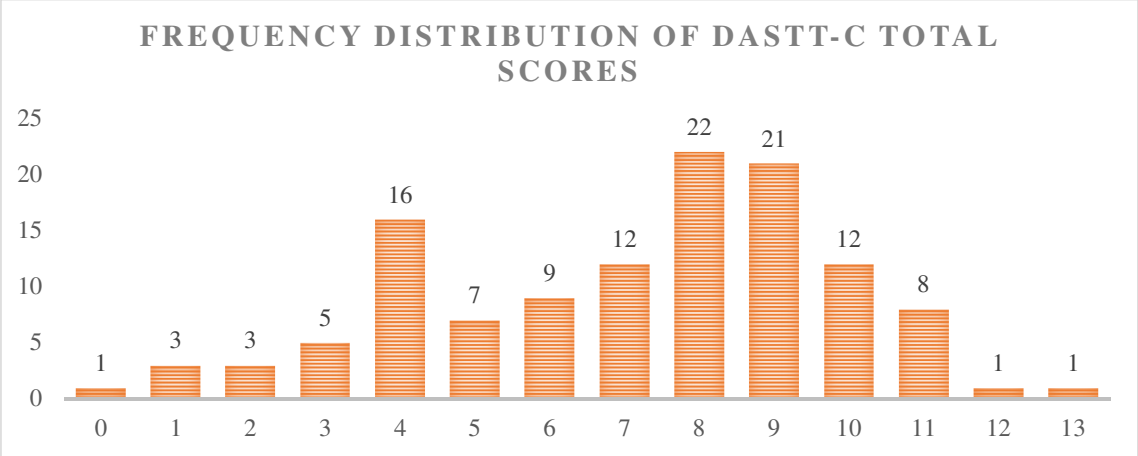

Figure 1. Frequency distribution of DASTT-C total scores.

The frequency distribution of DASTT-C elements in the drawings of prospective teachers is shown in Figure 2. Analysis of the data reveals that elements reflecting a traditional classroom environment have the highest frequency values. In the mental images of prospective teachers, the teacher is depicted as an authority figure standing (f=102), at the front of the class (f=80), and giving a lesson (f=86). Regarding the depiction of the classroom's physical structure, the classic 'arrangement in multiple rows' (f=81) and 'teacher's desk in the center' (f=80) drawings were frequently preferred. In contrast, the 'laboratory arrangement' (f=37) was preferred approximately twice as often as the classic classroom layout. Furthermore, while the use of visual aids (f=71) was common, the use of 'scientific information symbols' (f=8) containing experimental tools and equipment was remarkably low.

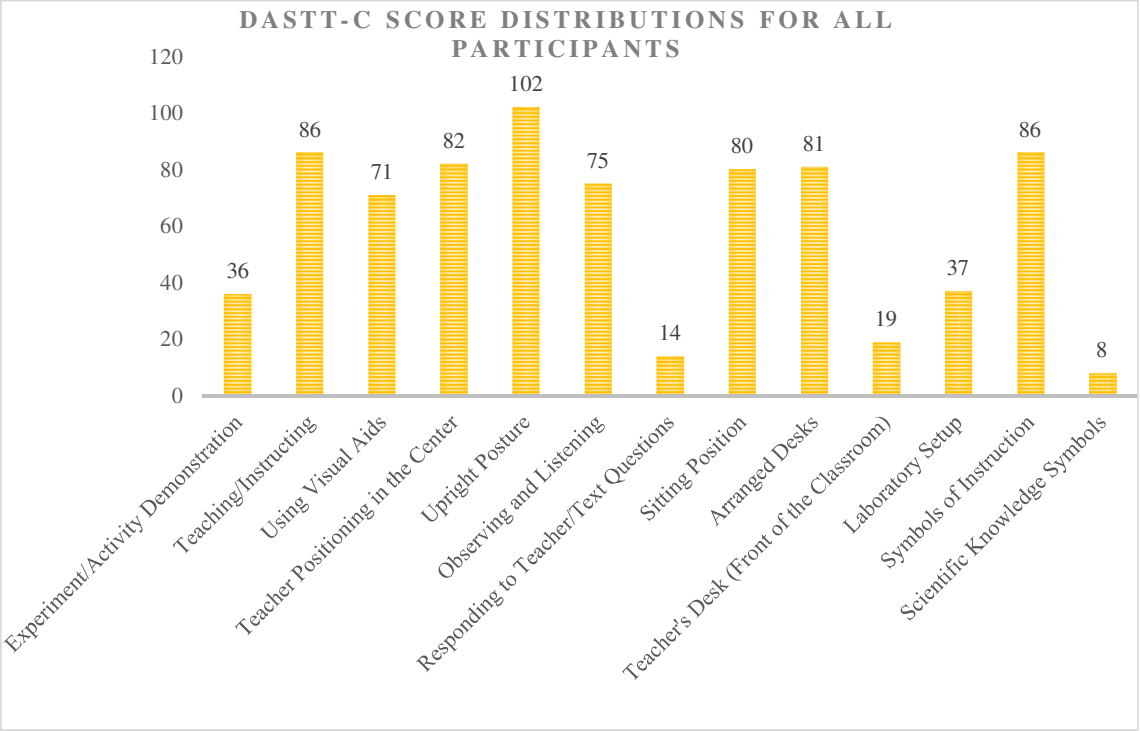

Figure 2. Frequency distribution of participants according to DASTT-C drawing items

When the teaching approaches adopted by prospective teachers were examined, it was observed that 60.3% of the participants adopted a mix learning approach (Table 6). The percentage of those who adopted a student-centered approach was 23.1%, and the percentage of those who adopted a teacher-centered approach was 16.5%. This distribution indicates that the majority of the sample has a transitional teaching perspective rather than a one-way teaching approach.

Table 6.
Distribution of Teaching Approaches Among All Participants

Teaching Approach	**n**	**%**
Student-centered	28	23.1
Mixed (Teacher-Student)	73	60.3
Teacher-centered	20	16.5

The total scores of the first group, consisting of 1st and 2nd graders, and the second group, consisting of 3rd and 4th graders, were compared using the Mann–Whitney U test. The analysis

revealed no statistically significant difference between the groups (U = 1872, p = .243). The p-value being greater than the .05 significance level indicates that the rank means of the compared groups are similar and that there is no significant difference in scores. Furthermore, the effect size was calculated as r = .11, which, according to Cohen's (1988) criteria, indicates a small effect (Table 7). This finding shows that the difference between the groups is not statistically significant and also has a limited effect at the practical level. This result indicates that the total scores do not differ significantly according to grade level.

Table 7.

Comparison of Groups Based on Total Scores

Total N	121
Mann-Whitney U	1446.000
Wilcoxon W	4606.000
Test Statistic	1446.000
Standard Error	182.150
Standardized Test Statistic	-1.169
Asymptotic Sig.(2-sided test)	.242

In separate comparisons between the four grade levels, post-hoc analysis results showed that 3rd-grade students differed significantly from some other grade levels (Table 8). After Bonferroni correction, the differences between 3rd-grade and 1st and 2nd-grade students remained significant. This finding suggests that a pattern of change in mental teaching images can occur at a specific stage in the teacher training process.

Table 8.

Comparing Grades Based on Total Scores

Grades	**Test Statistic**	**Std. Error**	**Std. Test Statistic**	**Sig.**	**Adj. Sig.[a]**
3rd grade -4th grade	-20.772	7.922	-2.622	.009	.052
3rd grade -2nd grade	27.400	9.207	2.976	.003	.018
3rd grade -1st grade	45.853	10.367	4.423	.000	.000
4th grade -2nd grade	6.628	8.628	.768	.442	1.000
4th grade -1st grade	25.081	9.856	2.545	.011	.066
2nd grade -1st grade	18.453	10.916	1.690	.091	.546

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is ,050.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Teaching approaches were examined using Chi-Square analysis according to group level. The analysis revealed a significant relationship between teaching approach distribution and the group variable ($\chi^2 = 49.46$, $p < .001$). Cramer's V value was calculated as .44, indicating a moderate-to-high level of influence. This finding shows that teaching approach preferences differ according to group level.

Table 9.

Correlation of Teaching Approach and Group İlişki (Chi-Square Test)

Variable	**χ^2**	**sd**	**p**	**Cramer's V**
Teaching Approach × Group	49.46	2	< .001	.44

Note: The Chi-Square test results show a statistically significant relationship between the teaching approach distribution and the group variable ($\chi^2 = 49.46$, sd = 2, $p < .001$). Cramer's V = .44 indicates a moderate-to-high level of effect.

The sub-dimensions of DASTT-C were examined at the group level using the Chi-Square test (Table 10). To control for the probability of Type I error in multiple comparisons,

Bonferroni correction was applied, and the significance level was set at .0038. After this correction, when the descriptive elements in the drawings were examined, it was observed that the difference was statistically significant more in the items where the teacher and student actively participated than in the physical environment. This difference was particularly pronounced in the student's "Observing and Listening" (χ2: 15.374, p: .001) and the teacher's "Teacher Positioning in the Center" (χ2: 12.168, p: .001) items. Similarly, the participants' drawings differed significantly in the "Teaching/Instructing" (p: .003), "Using Visual Aids" (p: .014), and "Experiment/Activity Demonstration" (p: .021) items. In contrast, no significant differences were observed between the groups in the other 8 sub-dimensions representing the physical environment of the classroom, such as “Arranged Desks”, “Teacher's Desk (Front of the Classroom)”, and “Laboratory Setup” (p>.05). These results indicate that the differentiation between the groups is more concentrated in the representations related to the positioning of teacher and student roles within the classroom. However, no significant differentiation was observed in the indicators related to the physical classroom arrangement.

Table 10.
Comparison of DASTT-C Subdimensions by Group (Chi-Square Test Results)

Variables (Drawing Elements)	χ2 value	sd (df)	P value	Significant Difference
Experiment/Activity Demonstration	5.286	1	.021*	Yes
Teaching/Instructing	9.065	1	.003*	Yes
Using Visual Aids	6.075	1	.014*	Yes
Teacher Positioning in the Center	12.168	1	.001*	Yes
Observing and Listening	15.374	1	.001*	Yes
Teacher's Desk (Front of the Classroom)	3.194	1	.074	No
Symbols of Instruction	3.053	1	.081	No
Laboratory Setup	1.712	1	.191	No
Responding to Teacher/Text Questions	1.633	1	.201	No
Upright Posture	1.593	1	.207	No
Arranged Desks	.129	1	.720	No
Scientific Knowledge Symbols	.029	1	.864	No
Sitting Position	.009	1	.926	No

Figure 3 shows the frequency with which prospective teachers used the elements of the DASTT-C scale in their drawings. The main difference between Group 1 and Group 2 participants is observed in the traditional classroom design. The item with the greatest difference between the groups was "Stand Tall" (Difference=36); however, no differentiation was observed between the groups in items such as 'Laboratory layout', 'Scientific symbols', and 'Experiment demonstration'. This indicates that Group 1 produced simpler drawings, while Group 2 was more inclined to use teacher-centered symbols in their teaching methods. When the frequency of prospective teachers' use of the elements of the DASTT-C scale in their drawings was examined in percentage terms (Figure 4), significant differences were observed between Group 1 and Group 2 in some items. Group 1 participants depicted the teacher's authority in the classroom through the elements of 'Position Centered' (11.60%) and 'Teaching' (11.60%). The study found that participants in group 2 showed a higher prevalence of the elements characterizing traditional education: ‘Upright posture’ (15.10%) and ‘Sitting in rows’ (11.40%). The high and similar rates (10.70% and 11.40%) of both groups using symbols of instruction (board, books, etc.) indicate the importance given to physical tools. In contrast, the use of scientific symbols was the least described element, occurring at around 1% in both groups.

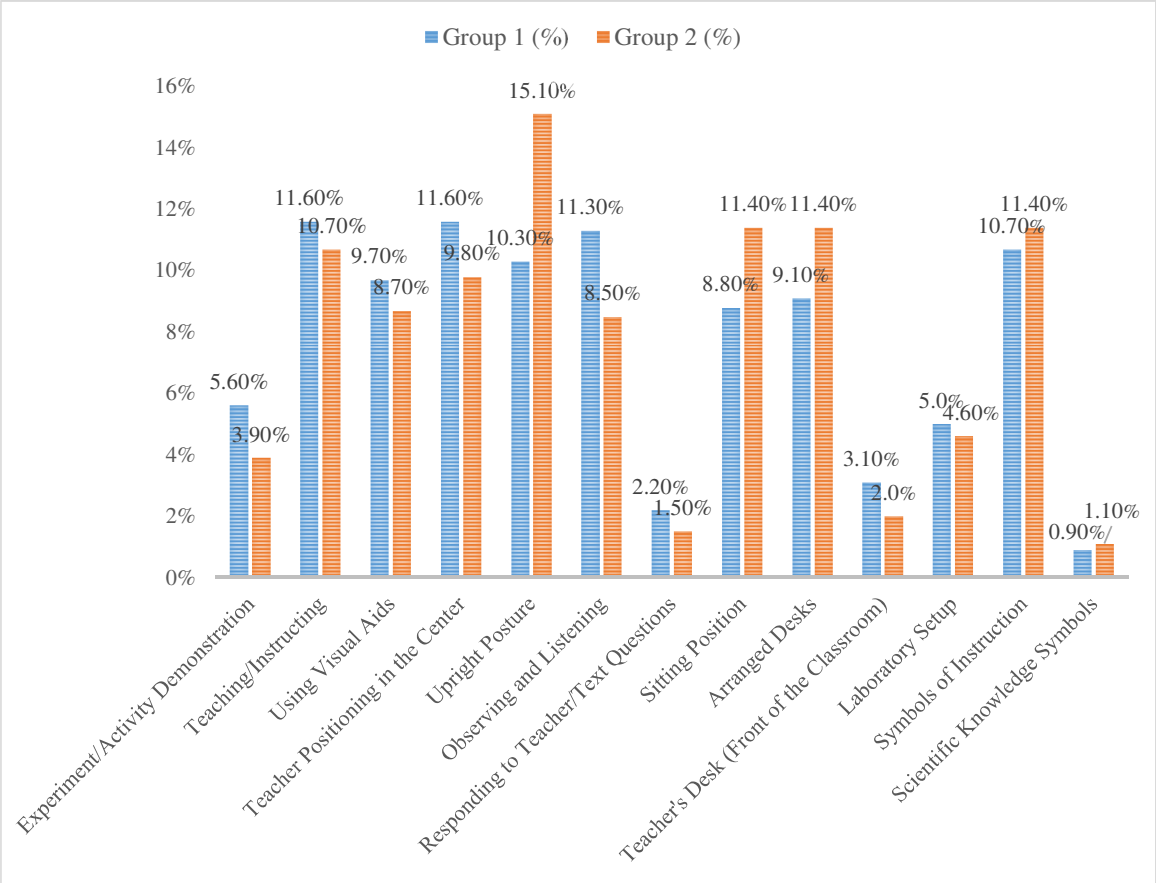

Figure 3. Percentage (%) distribution of DASTT-C subscale scores by group.

When examining the teaching approaches adopted by prospective teachers, it is observed that the "Mix Teaching" approach is the most prevalent in both groups. While 69% (n=29) of participants in Group 1 adopted a "Mix Teaching" approach, this rate was 56.4% (n=44) in Group 2. When comparing other styles, it was observed that Group 2 participants adopted a higher percentage of the "Student-Centered" teaching approach than Group 1 participants. Similarly, the "Teacher-Centered" teaching approach was also observed to be adopted by Group 2 participants at a higher percentage than Group 1 participants. (Figure 4-5).

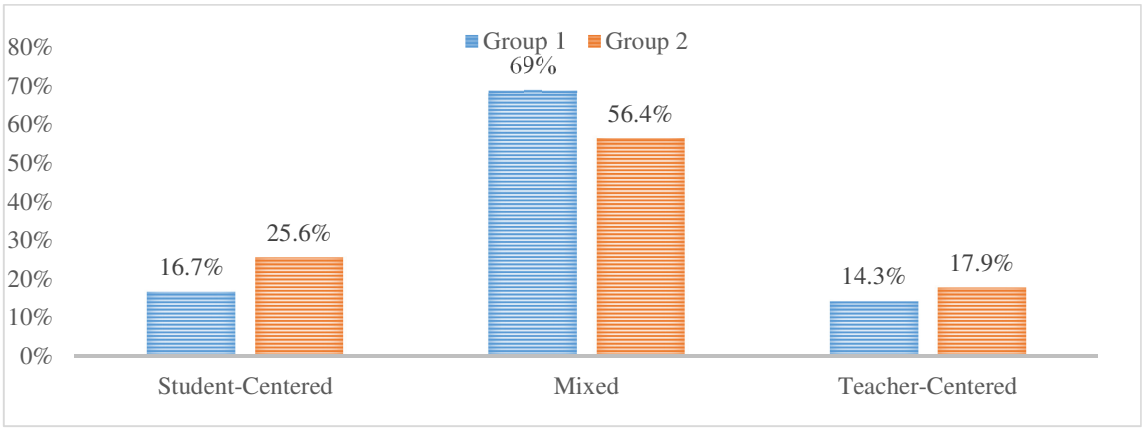

Figure 4. Percentage distribution of teaching approaches by group.

Figure 5. Examples of drawings from teaching approaches

Furthermore, when the distribution of informal teaching elements according to groups is examined, it is seen that 88.1% of the participants in Group 1 did not have informal teaching elements, while 11.9% did. In Group 2, 78.5% of the participants did not have informal teaching elements, while 21.5% did. Overall, it was determined that 81.8% of the participants did not have informal teaching elements, while 18.2% did. While the prevalence of informal teaching elements is not high in either group, it is noteworthy that this rate is higher in Group 2 compared to Group 1 (Table 11). Some drawing examples were represented in figure 6.

Table 11.
Distribution of Informal Teaching Elements by Groups (Frequency and Percentage)

Grup	**No Informal Teaching Elements**	**Yes Informal Teaching Elements**	**Total**
1. Group	37 (88.1%)	5 (11.9%)	42 (100%)
2. Group	62 (78.5%)	17 (21.5%)	79 (100%)
Total	99 (81.8%)	22 (18.2%)	121 (100%)

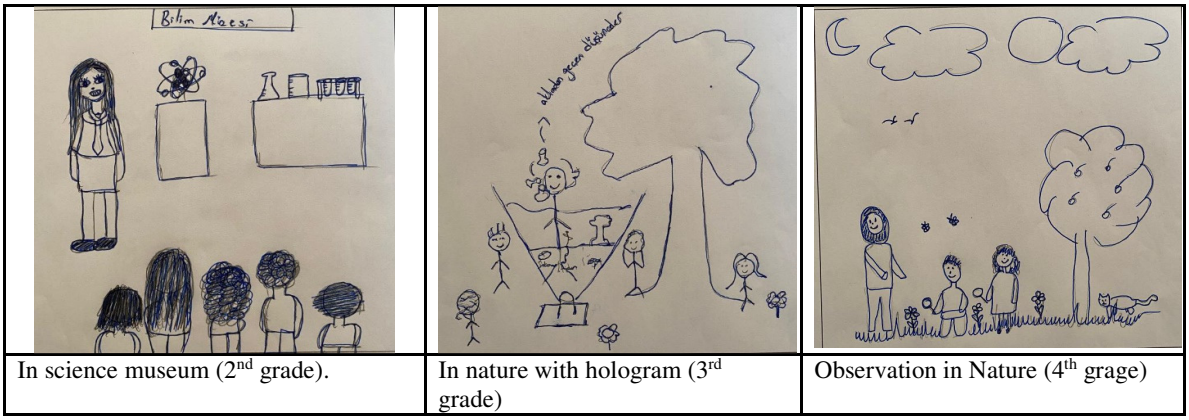

Figure 6. Examples of drawings from informal settings in classrooms.

CONCLUSION

This research aimed to evaluate the formation of teaching identities among prospective science teachers within the framework of the teacher education program conducted in Turkey, by examining their mental teacher images through the DASTT-C tool and considering the

program process. The findings showed that the majority of prospective science teachers' teaching approaches were concentrated in the "mixed" category. The average total DASTT-C score of 7.10 indicates that the participants clearly did not have a teacher-centered or fully student-centered teaching identity; rather, they adopted a hybrid teaching approach positioned in a transitional phase.

Analyses conducted in terms of class levels showed that 3rd-year students differed significantly when compared to other class levels. This finding suggests that the period in which pedagogical courses intensify in the teacher education process may indicate a restructuring process in the mental teacher images of prospective science teachers. In other words, the transition of prospective science teachers from the first two years, which are heavily focused on subject knowledge, to a period heavily focused on pedagogical practice may create a break or questioning phase in their teaching identity.

The lack of statistically significant differences in overall scores between groups does not indicate that the teacher training program directly and homogeneously transforms the teaching approach preference. However, the emergence of significant differences in some drawing elements (e.g., the teacher's central positioning, observation-listening behavior, emphasis on teaching) suggests that teaching identity may differ based on specific pedagogical representations rather than a quantitative total score. The low level of representation of informal learning environments in the drawings reveals that the out-of-school learning and skills-based approach emphasized in reform documents and program materials has not yet been strongly reflected in the mental images of prospective teachers. This suggests that there may be a distance between the reform discourse and the internalized teaching images of prospective teachers.

Overall, the findings show that the teacher training process produces a mixed and transitional teaching identity in prospective teachers rather than creating a direct paradigm shift. This result reveals that the formation of teacher identity is not a linear but a layered and reconstructive process. The mental images of prospective teachers are shaped within the interaction of the reform context, program content, and individual belief systems. This study examines the relationship between teacher education programs and teacher identity construction through mental imagery, offering a reform-oriented contribution to the DASTT-C literature. The findings indicate that teacher education programs should be evaluated not only at the content level but also in the context of prospective teachers' mental representations and professional identity development.

DISCUSSION

This research aimed to evaluate how teaching identity is structured and can be transformed within the context of teacher education programs, in light of international literature, by examining the mental images of science teaching among prospective science teachers through the DASTT-C. The findings show that the vast majority of participants concentrated in the “Mixed Teaching” approach (Table 6; Table 12) and the total mean score was 7.10 (SD=2.73). According to the classification of Thomas, Pedersen, and Finson (2001), this value indicates a hybrid teaching approach that is transitional rather than a distinct teacher-centered approach. This result is consistent with the findings reported in the DASTT-C literature over the last twenty years. Minogue (2010) stated that traditional classroom arrangements and limited student participation indicators were seen together in the drawings of prospective teachers; this indicates that teaching identity is shaped in a mixed structure. Similarly, Finson, Thomas, and Pedersen (2006) showed that teacher authority was strongly preserved in the mental representations of teaching styles among prospective teachers. Lay et al. (2013) state that the mental images of prospective teachers mostly reflect a hybrid teaching approach. In this study, as seen in Figure 2 and Table 11, the teacher's standing position, central location in the classroom, and emphasis on teaching are represented with high frequency. This

situation reveals the continuity of traditional teaching images in the core components of the teacher identity.

However, the findings presented in Table 9 show that the 3rd-year level differs significantly from other level levels. This difference suggests that a restructuring process may occur in the mental teaching images of prospective teachers during the phase where pedagogical courses intensify in the teacher training process. Uçar (2012) showed that prospective teachers can experience changes in their belief systems during the program process; Buldur (2017) revealed that teaching beliefs develop not linearly, but gradually and sometimes contradictorily. In this context, the differentiation observed at the 3rd-year level shows that teacher identity is not fixed, but a negotiated and restructured process. The lack of significant differences in total score comparisons between groups (Table 8) does not indicate that the teacher training program transforms the teaching approach homogeneously.

However, the emergence of significant differences in some sub-dimensions in Table 11, and the preservation of significant differences in indicators related to the teacher's positioning in the classroom and the student's role of observing and listening after Bonferroni correction, suggest that teaching identity is structured more through role distribution. This shows that teaching identity can be transformed through micro-level representations rather than total scores. In particular, divergences in indicators such as “Observing and Listening,” “Central Positioning,” and “Teaching” reveal that teacher identity is constructed through classroom roles. This is consistent with the literature indicating that sub-dimension analyses in DASTT-C studies can yield more sensitive results than total scores (Lay et al., 2013).

The limited representation of informal learning elements (Table 7) points to a possible gap between reform discourse and mental teaching images. Although contemporary science education literature and policy documents emphasize out-of-school learning environments, it is noteworthy that these representations are present at a low level in the mental images of prospective teachers, like Yılmaz et all (2007) and Yildiz Duban, (2013). studies. Shin and Alpern (2024) state that teacher identity is shaped not only by program content but also by the individual's previous learning experiences and cultural norms. In this context, it is expected that the traditional classroom structure experienced by prospective teachers for many years will be more persistent in their mental images. This study offers three main contributions to the international literature. First, it proposes a contextual model by analyzing teacher identity through mental images within the context of reform. Second, it interprets the Mixed Teaching approach not as a deficiency but as a transitional identity configuration. Third, it shows that in addition to the total score analysis, examinations at the sub-dimension level can reveal the transformation of teacher identity in a more explanatory way.

Overall, the findings show that the teacher education program produces a hybrid and transitional teaching identity in prospective teachers rather than creating a direct paradigm shift. Teacher identity; Reform goals are shaped in a layered way through the interaction of program content and individual belief systems. Therefore, teacher education programs need to be supported not only by content transfer but also by experiential and practice-based structures aimed at transforming prospective teachers' mental representations.

Limitations and Future Studies

Some limitations should be considered when interpreting these findings: The study is cross-sectional; therefore, it reveals patterns across grade levels rather than testing the causal effect of the program. Also, although drawing-based measures are strong, factors such as the production conditions of the drawings and the drawing skills of the participants may affect the representations. Future research could include (i) longitudinal follow-up with the same cohort, (ii) triangulation of DASTT-C with interview/focus group and lesson plan analysis, and (iii) intervention-based designs for informal learning components. In addition, while good inter-rater reliability (ICC) increases methodological confidence, replicate studies in different

institutions and program types (different universities/teacher training models) will strengthen generalizability.

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