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THE PREDICTIVE RELATIONSHIPS BETWEEN PRE-SCHOOL TEACHERS' CLASSROOM MANAGEMENT SKILLS AND THEIR THINKING-SUPPORTIVE BEHAVIOURS

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Abstract

This is a predictive study aiming to determine the extent to which pre-school teachers' classroom management (CM) skills predict thinking-supportive behaviours. Within the study, 183 preschool teachers participated. The data of the study was collected using Pre-school Teachers' Classroom Management Skills Scale (CMSS) and Thinking Supportive Teacher Behaviours Scale (TSTBS). In the analysis of the data, Pearson correlation analysis and multi-linear regression were used. In light of the strong predictive relationships obtained from the current study, it can be said that pre-school teachers should effectively manage their classrooms in order to display behaviours that support thinking in learning environments. The sub-dimension of Communication and Behavioural Regulations yielded the highest correlation with teacher behaviours that support thinking and was found to be a significant predictor. While there is no relationship between the Plan-Program Activities sub-dimension and the predicted variables, Time Management significantly predicted the clarity needed to support thinking, and Classroom Physical Arrangements significantly predicted reflection through documentation.

Keywords: Pre-school teacher, thinking supportive teacher behaviour, classroom management skill, thinking skills.

INTRODUCTION

Pre-school teachers' thinking-supportive behaviours

Although the interest in thinking education has increased since the 1980s, previous studies largely focused on thinking education of older students. The main reason for the shifting focus towards supporting thinking during the pre-school period in the last 20 years is that it is now accepted that the development of thinking skills in children starts at an early age (Arthur & Makin, 2001). In the literature, it is argued that teaching thinking at an early age serves the purpose of "preparing the child for primary school" and is a determinant of the child's future academic success (Salmon and Lucas, 2011) and contributes to the elements of cognitive, moral and personality development as a whole such as questioning, criticizing, finding alternative solutions, approaching with suspicion, testing accuracy and consistency (Lipman, 1991).

In every country that gives importance to pre-school education in order to achieve these outcomes, the importance of curricula in developing children's thinking skills has been recognized (Arthur & Makin, 2001). Thus, countries have restructured their education systems in order to train thinking individuals

with advanced information processing skills such as separation, matching, classification, causality, recognizing and solving problems, evaluating and making decisions (Taggard, Ridley, Rudd & Benefield, 2005) and they have made skills such as reflective and creative thinking the focus of their curricula. In addition, programs such as Philosophy for Children (P4C), Reggio Emillia, and High/Scope have been implemented in many countries of the world to develop thinking (Salmon, 2008; Salmon & Lucas, 2011). Considering Turkey in particular, it is seen that thinking skills were included in the cognitive and social development areas under the influence of the constructivist approach in the pre-school curriculum developed by the Ministry of National Education [MoNE] in 2006 and updated in 2013 (MoNE, 2013).

The inclusion of thinking skills in curricula has led many researchers to empirical research on the measurement of thinking as a product (determining the extent to which teachers or students have thinking skills). On the other hand, the inclusion of thinking skills in the curriculum or the teachers' having thinking skills were not considered sufficient to develop thinking in children, and it was argued that "teacher's behaviours also play an important role in fostering thinking skills of students in the classroom having a social and organic structure" (Costa, 1991). For this reason, studies focusing on the characteristics of the classroom atmosphere in which thinking is supported, try to describe the thinking class (Beyer, 2001; Doğanay & Sarı, 2012; Kline, 2002; Ritchhart, 2002) and aim to make visible what the behaviours of teachers that support thinking in this class are (Costa, 1991; Fisher, 2005; Kaymak, 2022) are very important in the literature today. It is pleasing for pre-school education, which has a critical importance in the acquisition of thinking skills, that teacher behaviours that support thinking have been discussed among pre-school teachers in the literature in the last 10 years.

In this context, when the literature is examined, the behaviours pre-school teachers are expected to display to support thinking in the classroom environment can be summarized as follows; asking higher-order and open-ended questions (Aubrey et al., 2012; Doğan Altun & Ekinci Vural, 2017; Nayfeld, 2014; Tuncer, 2017), including small and large group works and in-class dialogues and discussions (Aubrey et al., 2012; Fisher, 1995; Isbell and Raines, 2012; Salmon, 2008), preparing a physical environment that allows children to be active, move freely and access materials (Doğan Altun & Ekinci Vural, 2017), listening to each child in the class carefully without judging them (Ezmeci & Akman, 2016, Fisher, 2005), allowing children to reflect on the process they have followed by making comments on the activities (Benson & Dresdow, 2009; Salmon, 2008), stimulating children's sense of curiosity and research skills (Ezmeci & Akman, 2016; Fisher, 2005), planning activities that will lead to thinking and ensuring active participation of children (Doğan Altun & Ekinci Vural, 2017; Tuncer, 2017; Wallace et al., 2009), using the language of thinking (Ritchhart, 2002), allowing children to make mistakes and take risks (Sharp, 2014; Sternberg, 2013; Taggard et al., 2005), allowing children to plan and think about their own activities (Butterworth & Thwaites, 2013; Dağlıoğlu & Çakır, 2007; Epstein, 2003; Ezmeci & Akman, 2016; Taggard & Wilson, 2005), using a clear and comprehensible language (Alkın-Şahin & Tunca, 2015; Paul & Elder, 2019) and being a model for all these behaviours (Beyer, 1988; Chappell et al., 2008; Tabor, 1988; Walsh et al., 2007). According to the dimensions of the data collection tool developed in Turkish culture and used in the current study, the behaviours that the pre-school teacher should show to support thinking are addressed in four categories: clarity, reflection through documentation, providing free/flexible learning environments and asking questions (Kaymak, 2022).

Pre-school teachers' CM skills

According to Evertson and Weinstein (2006), a classroom should be managed by a teacher exhibiting behaviours supportive of students' cognitive, social and emotional learning as a whole. CM is defined as the strategies that provide physical and psychological safety in the classroom, the techniques that regulate the behaviours of students and create self-discipline, and the methods that ensure the regular progress of events in the classroom (Manning & Bucher, 201). When different perspectives on the purposes and dimensions of CM are synthesized, it is seen that it includes the provision of positive social interaction between student and teacher and between peers, offering counselling to students with behavioural problems, arranging the physical environment to maximize effectiveness, motivating

children to learn, effective use of time, organizing activities in accordance with the developmental characteristics of children to support their active participation and encourage collaborative work, guiding them to be self-confident individuals who take responsibility and motivate themselves for their own learning and taking precautions by predicting possible problems that may arise in the classroom (Burden, 2003; Emmer & Stough, 2001; Jones, 1996; Lemlech, 1999; Şentürk & Oral, 2008; Terzi, 2002).

It is a thing of the past to see CM as a discipline activity by controlling students, catching their mistakes, and resorting to punishment (Blazar & Kraft, 2017; Dinçer & Akgün, 2015; Hardin, 2004). As education becomes more and more learner-centred, it is clear that new democratic and participatory approaches to CM should be brought to the fore (Türk et al., 2019). In classrooms where these contemporary approaches are adopted, teachers are responsible for taking into account the personal and psychological needs of learners, integrating positive teacher-student relations with supportive environmental conditions, applying methods that facilitate learning, creating a rich learning environment with safe and flexible processes, and seeing learners as social beings (Akgün et al., 2011; Başar, 2005). It is more important for the pre-school teacher to take the aforementioned responsibilities and to have effective CM skills, especially because there are activity times instead of classes, the curriculum consists of ongoing activities, and the children are with the teacher throughout the day without a break in pre-school education (Jacobson 2003). Pre-school CM refers to the creation of a loving and orderly environment with arrangements that include change and flexibility. Meaningful learning and socialization and participation in classroom activities are important parameters of CM in pre-school (Uyanık-Balat, 2010). In order for teachers to effectively manage the classroom in pre-school, they are expected to exhibit behaviours such as creating and maintaining rules with children, designing resource-rich environments where meaningful learning takes place, providing learning experience by observing children, giving feedback, adjusting the pace of education and using different methods, supporting their learning, self-regulation and social skills and encouraging them to take risks and be independent (Akgün et al., 2011; Denizel Güven & Cevher, 2005; Lippard et al., 2018). According to the dimensions of the data collection tool developed in Turkish culture and used in the current study, the CM skills of the pre-school teacher are addressed in 4 categories: Classroom Physical Arrangements, Plan-Program Activities, Communication and Behavioural Regulations, and Time Management (Kaplan, 2018).

This study is constructed on the hypothesis that there are predictive relationships between pre-school teachers' CM skills and their thinking-supportive behaviours. Theoretically, the reasons for the relationship between the two variables can be explained as follows; (1) Effective CM research has revealed that well-organized and planned educational environments encourage self-regulation at an early age, increase interest in learning and encourage students to be productive and free and to take risks (Denizel Güven & Cevher, 2005; Lippard et al., 2018; Trawick-Smith et al., 2016) and these findings suggest that CM can also affect thinking. (2) Research argues that an effective learning-teaching process cannot be structured in poorly managed classrooms (Emmer and Stough 2001; Finger and Bamford, 2010), which suggests that CM skills may be related to thinking-supportive behaviours. (3) For the mastery of thinking in the pre-school period, teachers should use different teaching methods and techniques together and create flexible learning environments (Akbaba & Kaya, 2015), classroom environments where democratic and multi-faceted interaction experiences are encouraged, there is no restriction, an initiative can be taken, group dynamics are felt and different views are respected should be created to foster the development of thinking (Conatser, 2000; Şahin & Sarı, 2016) and a thinking classroom should be a place where individuals who think together, learn together and construct knowledge together through discussions as well as thinking individuals live (Liljedahl, 2016) and all these indicate that supporting thinking has a common aspect with CM skills. In short, since the development of thinking is affected by classroom climate, teacher, and student behaviours (Fisher, 1995), it is expected to be affected by teacher behaviours shown in classroom management. It is unthinkable that the behaviours shown to support thinking in pre-school cannot be independent of the skills shown for effective classroom management.

However, no study has been found in the literature that statistically tests this thesis and examines the predictive relationship between the teacher's behaviours to manage the classroom and support thinking. Studies on CM skills of pre-school teachers show that children in the classrooms of teachers with high CM skills are emotionally more positive, academically more successful (Hamre & Pianta, 2005), have more developed social and emotional competence (Morris et al., 2013), are better in attention, emotion and behaviour regulation (Webster-Stratton et al., 2001) and their level of participation is higher (Akyol, 2021; La Paro et al., 2004). However, no research has been found examining how CM skills contribute to students' thinking processes. In addition, in the literature, the relationship of CM skills of preschool teachers with different variables such as self-efficacy, professional motivation (Semerci, 2015), problem-solving skills (Zembat et al., 2017), counselling qualifications (Bilgin, 2019), and inclusive education proficiency (Aküzüm & Altunhan, 2017) has been examined. However, no research has been found examining the relationship between CM skills and thinking-supportive behaviours. An important reason for this may be that there are very few quantitative data collection tools to be used in the measurement of teacher behaviours supportive of thinking in pre-school, due to the fact that teacher behaviours that support pre-school thinking are a recent topic addressed in research.

The purpose of the current study is to determine the predictive relationships between CM skills and thinking-supportive behaviours, depending on the self-perception of preschool teachers. Through this purpose, this study was aimed at answering the following research questions.

- Do the scores taken by the pre-school teachers from the CM skills scale significantly predict the total scores they have taken from the thinking-supportive behaviours scale?
- Which of the sub-dimensions of CM skills significantly predicts thinking-supportive behaviours total scale and subscale scores?

It is hoped that the current study, with the relational and predictive evidence it presents, will provide a solution to the problems arising from "the detached, fragmented, structure of knowledge that focuses on breadth rather than depth" (Bowman et al., 2001) in professional development for preschool teachers.

METHOD

Research model

This is a predictive study aiming to determine the extent to which CM skills predict thinking-supportive behaviours. Within predictive research design, the relationships between determined variables are explained, and predictions made about a variable based on the other (Büyüköztürk et. al., 2018). In the study, thinking-supportive behaviours were set to be the dependent (predicted) variable and CM skills were set to be the independent (predictor) variable.

Study Group

The target population of the study was pre-school teachers working in preschool institutions affiliated with MoNE in a province in Turkey in the 2021-2022 education year. Among these teachers, 234 pre-school teachers selected by simple random sampling method composed the sample of the research. In order to determine the outliers from among the responses of 234 teachers to the items, the items were transformed into z values and the responses of the teachers with z values outside the range of between -3 and +3 in each item were accepted as outliers. Thus, 48 teachers were excluded from the analysis according to the results of the univariate outlier analysis. Outliers within the scope of multivariate outlier analysis were examined with the help of Mahalanobis values. When the probabilities of the Maholobis distance scores in the chi-square distribution were examined, the teachers with .001 and lower scores were accepted as outliers in multiple variables, and 3 teachers who appeared as outliers were excluded from the analysis. In this context, the sample of the research consisted of 183 teachers. The personal and professional information of 183 teachers who were included in the analyses after the outliers were removed from the study group is presented in Table 1.

Table 1. Information of the participating teachers

Variable	Level	n	%
Gender	Female	173	94.5
	Male	10	5.5
Length of service	1-10 years	93	50.8
	11-20 years	81	44.3
	21-30 years	9	4.9
Program graduated	Pre-school teaching	153	83.6
	Child development	30	14.4
Type of pre-school institution	Private	29	15.8
	Public	154	84.2
Total		183	100

Instruments

Information about the scales used in the current study to measure the CM skills and thinking-supportive behaviours of the pre-school teachers is given below.

Pre-school Teachers' Classroom Management Skills Scale (CMSS): The CMSS developed by Kaplan (2018) is a five-point Likert type scale (5=very good, 1=very poor) consisting of four factors: "Communication and Behavioural Regulations", "Classroom Physical Arrangements", "Time Management" and "Plan-Program Activities" and 49 items. The number of items in the factors is 24, 10, 6, 9, and CAC are .96, .88, .85, and .91, respectively. The CAC of the whole scale is .97, and the total variance explained is 63.72%. The CAC found for the whole scale in the current study is .96, and those of the factors are .95, .85, .80, and .90, respectively.

Thinking Supportive Teacher Behaviours Scale (TSTBS): The TSTBS developed by Kaymak (2022) is a five-point Likert scale (5=Reflects me thoroughly, 1=Does not reflect me) consisting of four factors: "Clarity", "Reflection through Documentation", "Providing Free/Flexible Learning Environments", "Asking Questions" and 19 items. The number of items in the factors is 7, 5, 4, and 3 and the Cronbanch Alpha internal consistency coefficients (CAC) are .89, .84, .74, and .66, respectively. The CAC of the whole scale is .91, and the total variance explained is 64.9%. The CAC found for the whole scale in the current study is .93 and those of the factors are .87, .88, .79, and .73, respectively. The data collection process was carried out in the 2021-2022 education year, and took approximately two months. It was determined that the teachers filled out the measurement tools in an average of 30 minutes.

Data analysis

In the analysis of the data, first of all, the normality assumption and skewness and Kurtosis values calculated for the data obtained from the answers given by the teachers to the "CMSS" and the "TSTBS" were checked. The skewness and Kurtosis values obtained for the scores taken from the factors; Clarity, Reflection through Documentation, Providing Flexible/Free Learning Environments, and Asking Questions, are (-.764; -.466); (-1.128; -.028); (-.793; -.294); (-.900; -.192) and (-1.223; .385), respectively. The skewness and Kurtosis values obtained from the scores taken from the factors; Communication and Behavioural Regulations, Time Management, Classroom Physical Arrangements, and Plan-Program Activities, are (-.493; -1.052); (-.682; -.961); (-.809; -.445); (-.438; -.842) and (-.445; -1.251), respectively. In measurements with normal distribution, the skewness and Kurtosis values in the range of ±1.0 are considered to be perfect, and the skewness and Kurtosis values in the range of ±2.0 are considered to be acceptable (George & Mallery 2001); thus, the measurement tools used in the current study meet the normality assumption.

In the current study, descriptive statistics were used to determine the teachers' CM skills and thinking-supportive behaviours, and multiple regression analysis was used to determine to what extent the CMSS sub-dimensions predict the total score of the thinking-supportive behaviours scale and the total

scores of its sub-dimensions. Before applying multiple regression analysis, necessary assumptions were tested with preliminary analyses. According to the first assumption, the "level of measurement" assumption, the measurements for the dependent and independent variables examined should be in the interval scale (Pallant, 2015). Since both measurement tools used in the current study are equally spaced scales, the first assumption has been satisfied. The second assumption is that the variables show a normal distribution. Both measurement tools used in the study show a normal distribution. The third assumption is that there is a moderate linear relationship between dependent and independent variables. When the Pearson Product Moments Correlation Coefficient between the mean scores obtained from the two scales was calculated, the third assumption was also met, since it was seen that there were moderate (between .37 and .66) positive linear and significant ($p<.01$) relationships between the dependent and independent variables (The correlation values between the variables can be seen in detail in the regression tables presented in the results section). The fourth assumption is that the correlation between the independent variables is below .80. The correlation between the independent variables in the study was found to be ranging from .76 to .44. This shows that there is no multicollinearity problem. The fifth assumption is that the Variance Inflation Factor (VIF) values are below 5. In the current study, the VIF value for Classroom Physical Arrangements is 2.563<5; for Plan-Program Activities, It is 3.152<5; for Communication and Behavioural Regulations, it is 3.491<5 and for Time Management, it is 1.814<5. These values show that there is no multicollinearity between the independent variables. Thus, the assumptions of multiple regression analysis were satisfied. The significance level of .05 was accepted as a criterion in interpreting whether the findings were significant or not.

RESULTS

In this section, first, the descriptive statistics on the teachers' CM skills (predictor variables) and thinking-supportive behaviours (predicted variables) are given in Table 2.

Table 2. Descriptive statistics for the predictor and predicted variables

Scale	Dimensions	N	K	min	max	Mean	Std.Dev.	$\bar{X}$/K
TSTBS	Clarity	183	7	26	35	33.05	2.51	4.72
	Reflection through Documentation	183	5	13	25	22.27	2.93	4.45
	Providing Free/Flexible Learning Environments	183	4	12	20	18.12	2.08	4.53
	Asking Questions	183	3	10	15	14.07	1.30	4.69
	TSTBS Total	183	19	66	95	87.50	7.65	4.61
CMSS	Classroom Physical Arrangements	183	10	34	50	44.72	4.31	4.47
	Plan-Program Activities	183	9	33	45	41.04	3.77	4.56
	Communication and Behavioural Regulations	183	24	94	120	111.94	8.52	4.66
	Time Management	183	6	21	30	27.84	2.36	4.64

As can be seen in Table 2, the mean scores taken from the whole TSTBS and its sub-dimensions and the whole CMSS and its sub-dimensions are quite high. The main purpose of the current study is to determine the extent to which CM skills predict thinking-supportive behaviours. The findings obtained from the multiple regression analysis conducted to this end are presented in Tables 3, 4, 5, 6, and 7.

Table 3. Multiple regression results related to the prediction of thinking supportive teacher behaviours

Predictive variables	B	Standard Error	β	T	p	Binary r	Partial r
Constant	17.526	5.937		2.952	.00		
Classroom Physical Arrangements	.178	.158	.100	1.127	.26	.526	.084
Plan-Program Activities	.182	.201	.089	.904	.37	.560	.068
Communication and Behavioural Regulations	.396	.093	.441	4.233	.00	.655	.302
Time Management	.368	.244	.113	1.512	.13	.497	.113
R=.67 R^2=.44							
$F_{(4-178)}$=36.09 p= .00							

When the pair-wise correlations shown in Table 3 between each dimension of the thinking supportive teacher behaviours and that of the CM skills are examined, it is seen that there are medium, positive, and significant correlations ($p<.01$) with the values of r=.53, r=.56, r=.66, r=.50, respectively. When the other variables were controlled, a medium (r=.30) correlation was found between the thinking supportive teacher behaviours and the sub-dimension of Communication and Behavioural Regulations and a low, positive and significant correlation with each of the other sub-dimensions. Teachers' CM skills together yield a medium and significant correlation with the scores of the thinking supportive teacher behaviours (R=.67, $p<.01$). Teachers' CM skills explain 44% of the total variance in thinking supportive teacher behaviours. According to the standardized regression coefficient (β), the relative order of importance of teachers' CM skills in terms of predicting thinking supportive teacher behaviours is as follows; "Communication and Behavioural Regulations", "Time Management", "Classroom Physical Arrangements" and "Plan-Program Activities". When the t-test results regarding the significance of the regression coefficients are examined, it is understood that only the "Communication and Behavioural Regulations" sub-dimension is a significant predictor of thinking supportive teacher behaviours while the remaining three variables are not significant predictors. According to the findings, the regression equation of thinking supportive teacher behaviours is as follows:

Thinking supportive teacher behaviours = 17.526 + .178 (Classroom Physical Arrangements), +.182 (Plan-Program Activities) + .396 (Communication and Behavioural Regulations) + .368 (Time Management)

Table 4. Multiple regression results related to prediction of "clarity"

Predictive variables	B	Standard Error	β	T	p	Binary r	Partial r
Constant	9.552	1.924		4.965	.00		
Classroom Physical Arrangements	-.001	.051	-.001	-.015	.99	.475	.001
Plan-Program Activities	.051	.065	.076	.776	.44	.539	.058
Communication and Behavioural Regulations	.143	.030	.484	4.709	.00	.664	.333
Time Management	.197	.079	.185	2.498	.01	.546	.184
R=.68 R^2=.45							
$F_{(4-178)}$=38.27 p= .00							

When the pair-wise correlations shown in Table 4 between "Clarity", a sub-dimension of thinking supportive teacher behaviours, and each sub-dimension of CM skills are examined, it is seen that there are medium, positive and significant correlations ($p<.01$) with the values of r=.48, r=.54, r=.66, r=.55, respectively. When the other variables were controlled, a medium (r=.33) correlation was found between the "Clarity" sub-dimension and the "Communication and Behavioural Regulations" sub-dimension and a low, positive and significant correlation with each of the other sub-dimensions. Teachers' CM skills together yield a medium and significant correlation with the "Clarity" sub-dimension (R=.68, $p<.01$). Teachers' CM skills explain 45% of the total variance in the "Clarity" sub-dimension. According to the standardized regression coefficient (β), the relative order of importance of teachers' CM skills in terms of predicting the "Clarity" sub-dimension is as follows; "Communication and Behavioural Regulations", "Time Management", "Plan-Program Activities" and "Classroom Physical Arrangements". When the t-test results regarding the significance of the regression coefficients are examined, it is understood that the sub-dimensions of "Communication and Behavioural Regulations" and "Time Management" are significant predictors of "Clarity" while the remaining two variables are not significant predictors. According to the findings, the regression equation of teacher behaviours supporting "Clarity" is as follows:

Teacher behaviours supporting clarity = 9.552 - .001 (Classroom Physical Arrangements), + .051 (Plan-Program Activities) + .143 (Communication and Behavioural Regulations) + .197 (Time Management)

Table 5. Multiple regression results related to the prediction of "reflection through documentation"

Predictive variables	B	Standard Error	β	T	p	Binary r	Partial r
Constant	.540	2.555		.211	.00		
Classroom Physical Arrangements	.137	.068	.200	2.003	.04	.484	.148
Plan-Program Activities	.089	.086	.115	1.034	.30	.485	.077
Communication and Behavioural Regulations	.075	.040	.218	1.868	.06	.514	.139
Time Management	.127	.105	.102	1.212	.22	.394	.090
R=.55 R^2 =.29							
$F_{(4-178)}$ =19.53 p= .00							

When the pair-wise correlations shown in Table 5 between "Reflection through Documentation", a sub-dimension of thinking supportive teacher behaviours, and each sub-dimension of CM skills are examined, it is seen that there are medium, positive and significant correlations (p<.01) with the values of r=.48, r=.49, r=.51, r=.39, respectively. When the other variables were controlled, low, medium and significant correlations were found between the sub-dimension of "Reflection through Documentation" and each sub-dimension of the CMSS. Teachers' CM skills together yield a medium and significant correlation with the "Reflection through Documentation" sub-dimension (R=.55, p<.01). Teachers' CM skills explain 29% of the total variance in the "Reflection through Documentation" sub-dimension. According to the standardized regression coefficient (β), the relative order of importance of teachers' CM skills in terms of predicting the "Reflection through Documentation" sub-dimension is as follows; "Communication and Behavioural Regulations", "Classroom Physical Arrangements", "Plan-Program Activities" and "Time Management". When the t-test results regarding the significance of the regression coefficients are examined, it is understood that only the "Classroom Physical Arrangements" sub-dimension is a significant predictor of "Reflection through Documentation" while the remaining three variables are not significant predictors. According to the findings, the regression equation of teacher behaviours supporting "Reflection through Documentation" is as follows:

Teacher behaviours supporting reflection through documentation = .540+ .137 (Classroom Physical Arrangements), +.089 (Plan-Program Activities) + .075 (Communication and Behavioural Regulations) + .127 (Time Management)

Table 6. Multiple regression results related to the prediction of "providing free/flexible learning environments"

Predictive variables	B	Standard Error	β	T	p	Binary r	Partial r
Constant	2.980	1.825		1.633	.00		
Classroom Physical Arrangements	.038	.049	.078	.770	.44	.419	.058
Plan-Program Activities	.008	.062	.014	.125	.90	.436	.009
Communication and Behavioural Regulations	.112	.029	.457	3.884	.00	.539	.280
Time Management	.023	.075	.027	.313	.76	.373	.023
R=.54 R^2 =.28							
$F_{(4-178)}$ = 18.61 p= .00							

When the pair-wise correlations shown in Table 6 between "Providing Free/Flexible Learning Environments", a sub-dimension of thinking supportive teacher behaviours, and each sub-dimension of CM skills are examined, it is seen that there are medium, positive and significant correlations (p<.01) with the values of r=.42, r=.44, r=.54, r=.37, respectively. When the other variables were controlled, low, medium, and significant correlations were found between the sub-dimension of "Providing Free/Flexible Learning Environments" and each sub-dimension of the CMSS. Teachers' CM skills together yield a medium and significant correlation with the "Providing Free/Flexible Learning Environments" sub-dimension (R=.54, p<.01). Teachers' CM skills explain 28% of the total variance in the "Providing Free/Flexible Learning Environments" sub-dimension. According to the standardized regression coefficient (β), the relative order of importance of teachers' CM skills in terms of predicting the "Providing Free/Flexible Learning Environments" sub-dimension is as follows; "Communication and Behavioural Regulations", "Classroom Physical Arrangements", "Time Management" and "Plan-Program Activities". When the t-test results regarding the significance of the

regression coefficients are examined, it is understood that the "Communication and Behavioural Regulations" sub-dimension is a significant predictor of "Providing Free/Flexible Learning Environments" while the remaining three sub-dimensions are not significant predictors. According to the findings, the regression equation of teacher behaviours supporting "Providing Free/Flexible Learning Environments" is as follows:

Teacher behaviours supporting providing free/flexible learning environments = 2.980 + .038 (Classroom Physical Arrangements), +.008 (Plan-Program Activities) + .112 (Communication and Behavioural Regulations) + .023 (Time Management)

Table 7. Multiple regression results related to the prediction of "asking questions"

Predictive variables	B	Standard Error	β	T	p	Binary r	Partial r
Constant	4.454	1.133		3.932	.00		
Classroom Physical Arrangements	.005	.030	.017	.171	.87	.411	.013
Plan-Program Activities	.034	.038	.098	.886	.38	.462	.066
Communication and Behavioural Regulations	.066	.018	.434	3.717	.00	.546	.268
Time Management	.021	.046	.037	.443	.66	.385	.033
R=.55 R^2=.29							
$F_{(4-178)}$ = 19.44 p= .00							

When the pair-wise correlations shown in Table 7 between "Asking Questions", a sub-dimension of thinking supportive teacher behaviours, and each sub-dimension of CM skills are examined, it is seen that there are medium, positive and significant correlations (p<.01) with the values of r=.41, r=.46, r=.55, r=.39, respectively. When the other variables were controlled, low, medium, and significant correlations were found between the sub-dimension of "Asking Questions" and each sub-dimension of the CMSS. Teachers' CM skills together yield a medium and significant correlation with the "Asking Questions" sub-dimension (R=.54, p<.01). Teachers' CM skills explain 29% of the total variance in the "Asking Questions" sub-dimension. According to the standardized regression coefficient (β), the relative order of importance of teachers' CM skills in terms of predicting the "Asking Questions" sub-dimension is as follows; "Communication and Behavioural Regulations", "Plan-Program Activities", "Time Management" and "Classroom Physical Arrangements". When the t-test results regarding the significance of the regression coefficients are examined, it is understood that the "Communication and Behavioural Regulations" sub-dimension is a significant predictor of "Asking Questions" while the remaining three sub-dimensions are not significant predictors. According to the findings, the regression equation of teacher behaviours supporting "Asking Questions" is as follows:

Teacher behaviours supporting asking questions = 4.454 + .005 (Classroom Physical Arrangements), +.034 (Plan-Program Activities) + .066 (Communication and Behavioural Regulations) + .021 (Time Management)

DISCUSSION and CONCLUSION

In the regression analyses conducted in the current study, the four sub-dimension of the CMSS "Classroom Physical Arrangements", "Plan-Program Activities", "Communication and Behavioural Regulations" and "Time Management" constituted the predictor variables and the total scores taken from the TSTBS and its sub-dimensions of "Clarity", "Reflection through Documentation", "Providing Free/Flexible Learning Environments" and "Asking Questions" constituted the predicted variables. The analyses revealed that the predictor variables of CM skills explain nearly half of the variance in the total score taken from the Thinking Supportive Teacher Behaviours and of the variance in its sub-dimension of "Clarity" while they explain nearly one-third of the total variance in the sub-dimensions of "Reflection through Documentation", "Providing Free/Flexible Learning Environments" and "Asking Questions". Accordingly, a significant part of the total variance in thinking-supportive teacher behaviours and its sub-dimensions stem from CM skills. These results show that the thesis put forward that the CM skills of preschool teachers will also be effective in supporting thinking has been largely confirmed. Moreover, it points out that the theoretical explanations of preschool teachers' CM skills and thinking-supportive behaviours overlap to a large extent with practices in classroom environments.

These findings obtained as a result of the regression analyses also concur with the correlation values between the dependent and independent variables. The findings show that there are medium, positive and significant correlations between the total score taken from the TSTBS and the scores taken from its sub-dimensions and the scores taken from the sub-dimensions of the CMSS. In this regard, it can be said that as the CM skills scores of the teachers increase, their level of showing the behaviours to support thinking in the classroom also increases. When the theoretical framework is considered, this result, which is expected, is, unfortunately, difficult to discuss in terms of empirical research findings. Since thinking-supportive behaviours is a current issue that has not been studied yet in the literature, no study directly contributes to the discussion of this relationship. Although it is thought that the studies on the relationship between preschool teachers' CM skills and thinking skills may contribute to the conduct of the discussion indirectly, it is remarkable that this subject has been rarely studied in the preschool education literature. In one study, significant relationships were found between preschool teachers' CM skills and problem-solving skills (Zembat et al., 2017), and in another one between Teacher Effectiveness and Critical Thinking Skills (Sim, 2019), which indirectly supports the results of the current study.

Partial correlation values in the study indicate that the highest amount of correlation is between the predicted variables and "Communication and Behavioural Regulations". In line with this finding, the results of the study show that the Communication and Behaviour Regulations sub-dimension is a significant predictor of the total thinking supportive teacher behaviours and the sub-dimensions of providing free/flexible learning environments, clarity and asking questions. In the items of the communication and behavioural regulations sub-dimension, "attention to clarity and comprehensibility when talking to children about expectations, problems and rules; effective listening; teaching children to be respectful to differences and giving children opportunities in problem-solving and decision-making processes" come to the fore (Kaplan, 2018). In the literature on supporting thinking, it is emphasized that teachers use clear language (Alkın-Şahin & Tunca, 2015; Paul & Elder, 2019), create opportunities for children to make decisions and solve problems (Akman, 2011; Craft, 2003), and listen carefully to every child in the class without judging them (Ezmeci & Akman, 2016; Fisher, 2005). Therefore, it can be said that the results of the current study are quite natural when it is considered that regulating communication and behaviours while managing the classroom is a prerequisite for supporting thinking.

In addition, the results of the current study show that the sub-dimension of time management is a significant predictor of the clarity dimension, and the sub-dimension of classroom physical arrangements is a significant predictor of the sub-dimension of reflection through documentation. Clarity is related to the careful selection and clear use of appropriate words and not using ambiguous words (Alkın-Şahin & Tunca, 2015). To ensure clarity, the subject should be made clear, exemplified and explained, and children should be asked to use clear, distinct, and understandable language (Paul & Elder, 2019). Since showing these behaviours requires teachers to use time effectively in the classroom, it is an expected finding that time management is a significant predictor of clarity.

An important result reached in the study is that the Plan-Program Activities sub-dimension, one of the predictor variables, does not significantly predict almost any of the predicted variables. It is thought that this may be due to the meaning attributed to the relevant sub-dimension in the data collection tool used. In the literature, it is stated that plan and program activities as a component of CM should be arranged in a structure that is suitable for the developmental characteristics of children, support their active participation in the learning process, and encourage collaborative work (Terzi, 2002; Burden, 2003; Emmer & Stough, 2001). A classroom environment with this structure is conducive to teacher behaviours that support thinking. However, when the items of the scale are examined, it is observed that the children's active participation in learning and working together are not emphasized in the plan and program activities, but rather their suitability for the interests and abilities of children is brought to the fore (Examples: Preparing activities that will attract children's attention, Preparing materials that will attract children's attention, Using materials that will attract children's attention, Managing the daily flow in the sequence of being active and relax, Using different transitions between activities

(song, dance, movement, etc.) (Kaplan, 2018). The difference in the meaning attributed to the relevant dimension by the literature and scale items may be due to the complexity of the structure of classroom management, which is difficult to understand comprehensively (Nancy et al., 2016).

These results are limited to the data obtained from 183 preschool teachers. In light of the strong predictive relationships obtained from the current study, it can be said that pre-school teachers should effectively manage their classrooms in order to display behaviours that support thinking in learning environments. Thus, some contributions can be made to the inculcation of thinking skills such as critical, reflective, creative thinking, problem-solving, evaluation, and decision making at an early age.

The sub-dimension of communication and behavioural regulations yielded the highest correlation with teacher behaviours that support thinking and was found to be a significant predictor. In this context, knowledge and awareness about the characteristics of the relevant dimension should be acquired by pre-service teachers in teacher training programs and by teachers in in-service training programs to be given on thinking-supportive behaviours.

In the current study, the lack of a correlation between the Plan-Program Activities sub-dimension and the predicted variables was associated with the problem of content validity of the items in the relevant dimension in the measurement tool. In this connection, the relevant dimension of the measurement tools developed in relation to CM skills within the scope of pre-school education should be reviewed in a way to cover all the meanings attributed to this dimension in the literature. In addition, using different measurement tools that measure CM skills, research can be conducted to test the relationship of the relevant dimension with thinking-supportive behaviours.

The fact that the sub-dimension of time management significantly predicts clarity required to support thinking, and that the sub-dimension of classroom physical arrangements significantly predicts reflection through documentation are among the results that should be reflected in teachers' professional development programs. It is hoped that professional development programs, which are structured by considering these predictive relationships, will move them away from the criticism that superficial and fractured information is presented with a reductionist approach. Although the number of studies on preschool CM skills is relatively high in the literature, the limited number of studies on thinking-supportive teacher behaviours has made it difficult to discuss the results of the current study in reference to the literature and to reach generalizations. Thus, teacher behaviours that support thinking in the context of pre-school education should be the subject of further research. In addition, similar studies can be carried out on different samples by using the measurement tools used in the current study so that more generalizable results can be obtained. Finally, in future research, related teacher behaviours can be examined through student opinions or classroom observations.

Ethics and Conflict of Interest

The research was conducted with ethical principles of the Human Research Ethics Committee of Kütahya Dumlupınar University (16.03.2022 – 2022/02). The authors declare that they acted in accordance with the ethical rules throughout the research process and that there is no conflict of interest between the authors.

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