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Teachers' Opinions on the eTwinning Portal (Sakarya Province Example)

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Annotation. This research was conducted to examine the views of teachers in Sakarya regarding the eTwinning Portal. It will also examine the use of the Portal in Sakarya according to various factors such as discipline, professional seniority, educational qualifications, gender, age, and the institution they work for. The results indicate that teachers generally have positive perceptions of the eTwinning Portal. There is only a notable difference in the institution type variable.

Keywords: *entrepreneurship, teacher, eTwinning Opinion Scale, professional development, education technology, EU projects.*

Introduction

Today, AI-based programs are becoming more widespread, and their area of use is expanding, influencing education systems. Educational systems are affected by technological advancements, and as the implementation of digital technologies expands, the application areas of artificial intelligence are also broadening (Zhai et al., 2021; Balogh, 2024). The e-Twinning portal is one of the examples in the field of education.

The eTwinning Project was commenced in 2005 as a fundamental activity of the European Commission's e-learning program. Today, technology integration practices are supported in schools through various national and international events. The eTwinning Project is currently running as a significant component of the European

Commission's e-learning strategy within the framework of the Erasmus+ program (Milković et al., 2023; Gilleran, 2019). The eTwinning portal provides a long-term perspective for monitoring progress, identifying trends, and shaping the pedagogical dimension of eTwinning in the years to come (Kearney & Gras-Velasquez, 2015).

In 2009, Türkiye became a member of the eTwinning portal. Participants of this portal are educators using it to carry out projects through the platform, enhance their professional development, and collaborate with their colleagues by maintaining effective communication (Kaplan & Alkan, 2023). Through regional and national conferences as well as introductory seminars organized by the Ministry of National Education, the eTwinning platform has become widely used (Acar & Peker, 2021). As of 2019, eTwinning projects, recognized as one of the most successful and widespread lifelong learning initiatives supported by the European Commission within the framework of the Erasmus+ program, have served a fundamental function in enhancing students' competencies in multiple domains, such as digital skills and language learning. Also, by providing educational opportunities and facilitating the formation of a dynamic professional network, the eTwinning platform gives instructors a strong professional development area (eTwinning Türkiye, 2024). The eTwinning portal comprises the main homepage, which includes eTwinning-related information, training opportunities, webinars, and project details, as well as teacher profiles. In addition to the homepage, the portal features a project space where educators can design their own collaborative settings using a variety of Web 2.0 tools such as blogs, e-mail, and chat applications (Bozdağ, 2018).

The eTwinning network is administered by three different groups. The first is the Central Support Service (CSS), which ensures coordination at the European level. The CSS is responsible for organizing online platforms as well as arranging events for teachers and coordinators across Europe (Erasmus+, 2016, p. 17). The second group consists of members of the National Support Services (NSS), designated by the national educational authorities of each country. This team assists schools and teachers in registering with eTwinning, finding project partners, and designing projects. The NSS is also responsible for the national promotion of the eTwinning network and for awarding National Quality Labels (Bozdağ, 2017; Erasmus+, 2016, p. 179).

Teachers can transcend the limitations of a four-walled classroom, two textbooks, and five weeks of lessons by encouraging students to learn by doing. Furthermore, they can replace conventional, artificial classroom activities with socially and emotionally meaningful communication tasks that introduce students to a multilingual and multicultural world (Gajek, 2018).

Ultimately, professional development is a process that takes place in line with teachers' needs and educational objectives. eTwinning projects are highly successful instruments for improving teachers' professional abilities. It is believed that continued support from this platform will enable teachers to further advance in their professional development (Kaplan & Alkan, 2023).

Literature Review

Participation in eTwinning Projects and Teachers' Professional Development

In a survey conducted with early childhood education teachers, participants were asked why they registered with eTwinning and which factors encouraged them to join. About 70% of participants claimed that they enrolled because of either their interest in new forms of teaching or their desire to collaborate with partners throughout Europe (EU, 2022).

According to the participation data, Türkiye is in the forefront in terms of engagement within the eTwinning network (European Union, 2022; Gajek, 2022). Examples of good practices are publicly shared with other teachers. Furthermore, the use of the diverse digital tools available to participants reflects both the preferences and intentional actions of the teaching community engaged in the eTwinning program (Gajek, 2022).

In a qualitative study conducted by Alananbeh (2023), the perspectives of ten teachers on the impact of their involvement in the eTwinning platform on their professional and personal growth are examined. All the teachers reported that the platform had a positive influence on both domains. An analysis of the codes related to personal development revealed that most participants considered the platform helpful in enhancing their self-confidence, improving their communication skills, and fostering collaboration and sharing. Teachers additionally emphasized that exchanging knowledge with colleagues contributed to their sense of professional satisfaction (Alananbeh, 2023).

Teachers participating in eTwinning projects indicated that their involvement contributed positively to their professional competencies. According to their views, eTwinning projects facilitated the development of teachers' professional knowledge, professional skills, as well as professional attitudes and values. Previous study indicates that eTwinning activities offer flexible learning environments, promote intercultural engagement, support professional development through practice-based experiences, and have a beneficial impact on teachers' motivation (Aktepe et al., 2025; Döger & Kurnaz, 2022; Kaplan & Alkan, 2023). Additionally, these projects improve digital competency, increase information accessibility, cut down on paper use, and promote the efficient use of Web 2.0 applications in educational settings by enhancing teachers' digital skills (Akdemir et al., 2024).

From a cognitive perspective, participation in eTwinning projects has also been associated with improved critical thinking skills. Teachers who were involved in such projects reported that the activities promoted creative thinking, reduced dogmatic approaches, and supported accurate analysis and evaluation processes (Kaya & Şad, 2025).

Studies conducted both in Türkiye and across Europe further show that teachers demonstrate high levels of digital literacy in addition to being prepared for online education and technology integration. Within this framework, teachers consider

eTwinning as beneficial in multiple ways, including the enhancement of teaching methods, the development of foreign language proficiency, intercultural interaction, and professional collaboration (Gökbulut, 2023; Özen & Çıray Özkara, 2023). The eTwinning platform contributes significantly to teachers' personal development as well as their professional development. The platform is so effective that it not only fosters teachers' professional and personal development but also transforms their attitudes on the teaching profession (Acar & Peker, 2021; Şenel & Han, 2024).

Overall, the literature consistently emphasizes that the eTwinning platform contributes significantly to the teachers' professional and personal development. Alongside skill development, participation in eTwinning projects has been demonstrated to alter teachers' perspectives on the teaching profession, fostering innovation, collaboration, and reflective practice (Acar & Peker, 2021; Şenel & Han, 2024). Previous studies highlight essential benefits such as intercultural exchange, digital literacy development, pedagogical improvement, enhanced communication skills, improved critical thinking, and sustainable professional development (Acar & Peker, 2021; Aktepe et al., 2025; Başaran et al., 2020; Gökbulut, 2023; Kaplan & Alkan, 2023; Kaya & Şad, 2025; Özen & Çıray Özkara, 2023; Şahin et al., 2024; Şenel & Han, 2024).

Entrepreneurship

The subject of entrepreneurship in education has been studied from several perspectives. Through a comprehensive analysis of educational research, Ho, Lu, and Bryant (2021) distinguished between entrepreneurial teachers and entrepreneurial employees in the business sector. They defined teacher entrepreneurial behavior as encompassing resource-seeking, innovation advocacy, initiative-taking, ownership, and risk-taking.

It is required of teachers to show problem-solving and critical thinking skills, effective communication skills, self-confidence, a strong achievement orientation, and innovative and socially responsible competencies. Many of these traits and entrepreneurial tendencies are strongly related (Baum & Locke, 2004). Consequently, entrepreneurial competencies, encompassing creativity, initiative, and the capacity to translate ideas into action, enhance teachers' effectiveness in project work.

Entrepreneurial skills are increasingly seen as important skills for individuals. They also encompass an entrepreneurial spirit that includes creativity, risk-taking, and the ability to translate ideas into action (European Commission, 2013). Simultaneously, scholars have emphasized the significance of improving educational quality through innovative and creative teaching methods (Peltonen, 2015).

Contemporary teacher education policies are expected not only to equip teachers with pedagogical content knowledge but also to prepare them comprehensively across multiple domains. In today's context, entrepreneurial skills are regarded as among the most critical qualities a teacher should possess (Uaidullakyzy et al., 2022).

In 2018, the European Union Council adopted the Recommendation on Essential Competencies for Lifelong Learning. These competences include literacy, multilingualism, digital competence, citizenship, entrepreneurship, cultural awareness and expression, and personal, social, and learning-to-learn competences (Cinganotto, 2017; European Union, 2023). By focusing on personalized instruction, innovative pedagogical approaches are viewed as fundamental tools for teachers to collaborate and improve their ongoing professional growth and competencies.

The eTwinning program contributes directly to the development of these competences by creating collaborative and meaningful learning environments for both teachers and students. eTwinning activities align with curriculum requirements in participating countries and reflect the most recent framework of lifelong learning competences, including entrepreneurship competence (Gajek, 2021).

Educator leaders at every level of the school hierarchy should demonstrate teacher entrepreneurial behavior (TEB), which enables them to implement innovations that improve practices across their institutions, from classrooms to administrative offices (Ho & Lee, 2023). Teachers are encouraged, as eTwinners were even before the pandemic, to experiment with innovations and extend their teaching competencies beyond the formal requirements of curricula and established instructional practices (Gajek, 2021). By collaborating in eTwinning projects, sharing good practices and examples of global connections, and developing a deeper understanding of challenges faced, teachers form a community of practice. As a result, teachers feel more a part of the European teachers' community that embraces a multilingual, multicultural, and technology-oriented approach to education (Gajek, 2018).

The report entitled "Investigating the Impact of eTwinning on Early Childhood Education and Care and Initial Vocational Education and Training" examines participants' backgrounds, their profiles regarding eTwinning experiences and involvement, and their levels of engagement in eTwinning activities. Türkiye, Romania, and Greece have the biggest participant groupings based on nation distribution. With respect to professional development, most teachers expressed interest in teaching and learning methodologies, subject-specific topics (e.g., seminars on teaching methods in areas such as digital awareness or health education), and new approaches to student assessment (EU, 2022). It reveals teachers' willingness to learn how to use new technologies and to develop their multicultural competencies.

Within this scope, no research has been found in Sakarya City aimed at determining teachers' views on the eTwinning portal. The absence of research analyzing teachers' views on the eTwinning portal in Sakarya Province according to variables such as school type, subject area, gender, age, seniority, etc., may be argued to make this an original, necessary and important topic for the research.

In Sakarya, teachers conduct both national and international projects through the eTwinning portal, and interest in the platform continues to increase. The aim is to

determine the extent to which teachers use the e-Twinning portal developed within the scope of EU projects and to ascertain the views of teachers working in different subjects regarding the e-Twinning portal according to their personal characteristics. In this context, it is understood that the scale developed to determine the opinions of participating teachers has two sub-dimensions. Determining whether there are significant differences in teachers' opinions based on these sub-dimension scores according to variables such as gender, subject, age, type of school they study in, seniority, educational status, etc., can also be considered among the sub-objectives of this research.

Within this scope, the research aims to determine the views of teachers studying in different branches and school types in Sakarya City regarding the e-Twinning portal, which can be stated as the main problem of this research. When reviewing the literature, it is observed that the majority of studies examining attitudes on the e-Twinning portal have been researched and analyzed based on factors such as gender, age, seniority, branch, educational status, type of school employed at, etc. Therefore, in this study, carried out for the first time in Sakarya City, these variables were selected for the research because analyzing the existing situation according to the variables used in other similar studies could provide the opportunity to present, discuss, and compare the current situation in the most scientific manner. That's why the problem of this study is to determine the opinions of preschool teachers in Sakarya City regarding the eTwinning portal. Based on this main problem of the study, we can develop some sub-problems, which are presented below:

1. What are the levels of teachers' opinions about the eTwinning portal?
2. Do teachers' opinions about the eTwinning portal differ according to gender, age, educational level, professional seniority, branch, and type of institution?
3. Do the sub-dimensions of the "eTwinning Portal Scale", namely entrepreneurship and participation scores, differ according to gender, age, educational level, professional seniority, branch, and type of institution?

Method

Research Design

This research utilized a descriptive survey model, a type of quantitative research method. Survey models are research approaches that aim to describe past or present situations as they are. The goal of the study is to quantitatively characterize the phenomenon, individual or object under study (Creswell & Creswell, 2018; Karasar, 1995).

Sample

The sample of the study was selected by means of random sampling from among teachers working at schools of all levels in five districts of Sakarya City. When calculating the power of the sample size, the estimated effect size for the two-sample t-test was taken as 0.5, the confidence interval as $p < .05$, and the power as 0.80. Using these data, the total sample size was found to be 128. One of the survey questions stated: "If you do not have any knowledge about the eTwinning portal, you may refrain from completing the questionnaire." Teachers who responded to this item were excluded from the study sample, and thus, 220 teachers were removed. The data of 155 teachers were included in the analysis.

Statistical data on the participants' gender, age, educational level, professional seniority, branch, and type of institution are presented in Table 1.

Table 1

Demographic Characteristics of Participants

	Groups	Frequency (f)	Percent (%)
Gender			
	Male	40	25.8
	Female	115	74.2
Age			
	22–29	28	18.1
	30–35	48	31.0
	36–41	37	23.9
	42–47	27	17.4
	48 age and above	15	9.7
Education			
	Associate's degree	20	12.9
	Bachelor's degree	126	81.3
	Master's degree	8	5.2
	PhD.	1	.6
Professional seniority			
	1–5 year	28	18.1
	6–10 year	26	16.8
	11–15 year	48	31.0
	16 year and above	53	34.2
Branch			
	Preschool teacher	21	13.5
	Primary school teacher	54	34.8

	Groups	Frequency (f)	Percent (%)
	Math teacher	14	9.0
	Science teacher	10	6.5
	English teacher	25	16.1
	Computer teacher	3	1.9
	Other	28	18.1
Institution type			
	Kindergarten	19	12.3
	Primary school	76	49.0
	Middle school	43	27.7
	High school	17	11.0
Total		155	100

Table 1 presents the statistical data regarding the personal profiles of the teachers who participated in the study. Fifty-five percent of the teachers are between the ages of 30 and 41. Sixty-five percent of the teachers have 11 or more years of professional experience. In terms of school type distributions, 49% of the teachers work in primary schools.

Instrument

The questionnaire prepared by the researcher was used as a data collection tool in the study. The questionnaire consists of six questions related to demographic characteristics. It also includes one yes-no question. The initial version of the scale comprised 17 Likert-type questions concerning the eTwinning portal. A five-point Likert scale, ranging from "strongly disagree" to "strongly agree", was used to structure the scale. The "eTwinning Portal Opinion Scale", developed to measure teachers' views on the portal, was examined by three expert academicians, and their opinions were incorporated. Subsequently, the scale was administered to 100 individuals during the 2020 academic year, the reliability coefficient was calculated, and an exploratory factor analysis was conducted.

The KMO result of 0.911 indicated that factor analysis could be applied to the scale. According to the KMO result, the sample size was adequate for factor analysis (Islamoğlu, 2011). The reliability of the scale was found to be Cronbach's Alpha ($\alpha = .94$), which indicates excellent reliability. The exploratory factor analysis findings showed that the scale had a two-factor structure. Additionally, within the scope of reliability levels, Corrected Item Total Correlations were also examined regarding the reliability levels of the measurement tool items, and it was determined that all of them were positively correlated and had high-level relationships ranging from .58 to .78. Furthermore, two items with low factor loadings (items 11 and 17) were excluded, and the scale was finalized. Examples of items from the scale are as follows:

1. I actively use the eTwinning portal.
2. I follow the projects carried out on the eTwinning portal.
3. I believe that the eTwinning portal contributes to my professional development.
4. The eTwinning portal is easy to use.

In its final form, the scale was found to have two sub-dimensions: "Entrepreneurship" and "Participation". The first sub-dimension, Entrepreneurship, consists of items 3, 4, 5, 6, 7, 8, 10, 11, 12, and 15. The second sub-dimension, participation, consists of items 1, 2, 9, 13, and 14. The maximum score obtainable from the scale is 75. The two-factor structure explains 67% of the total variance.

Data Collection

The personal information form with six questions and the 15-item "eTwinning Portal Opinion Scale" (EPOS) were distributed to teachers in person, and the forms were collected by the researcher. After reviewing the collected forms, incomplete ones were excluded from the study.

Data Analysis

The data obtained from 155 teachers were entered into SPSS 20 for statistical analysis. Normality analyses were then conducted on the data. For normality analysis, the One-Sample Kolmogorov-Smirnov Test was first applied. Since the test result (.039; $p < .05$) showed a p-value less than .05, the assumption of normality was not met. However, the normal distribution of the sample can also be determined by examining skewness and kurtosis values (Can, 2022). These tests are explained below. Subsequently, parametric and non-parametric tests appropriate to the research questions were applied.

Findings

The descriptive statistics for the total scores obtained from the "eTwinning Portal Opinion Scale" (EPOS) and for its sub-dimensions "Entrepreneurship" and "Participation" are presented in Table 2. The normal distribution of the sample was assessed by examining skewness and kurtosis values. If these values fall within the range of ±2, they are considered acceptable (George & Mallery, 2010). In line with these results, it was concluded that parametric tests could be used in the statistical analyses.

Table 2
eTwinning Portal Opinions Scale Descriptives

		Statistic	Std. Error
Total	Mean	48.72	1.05
	Std. Deviation	13.15	
	Minimum	15.00	
	Maximum	75.00	
	Range	60.00	
	Skewness	-.291	.19
	Kurtosis	.305	.38
Entrepreneurship	Mean	34.46	.71
	Std. Deviation	8.93	
	Minimum	10.00	
	Maximum	50.00	
	Range	40.00	
	Skewness	-.64	.19
	Kurtosis	.70	.38
Participation	Mean	14.25	.43
	Std. Deviation	5.41	
	Minimum	5.00	
	Maximum	25.00	
	Range	20.00	
	Skewness	.13	.19
	Kurtosis	-.68	.38

The total score of the questionnaire is 75. Accordingly, the teachers' mean score on the eTwinning Portal Opinion Scale (EPOS) was found to be 65%, indicating a high level. On the sub-dimension of Entrepreneurship, teachers' mean score was 69%, also considered high. On the sub-dimension of Participation, teachers' mean score was 57%, which is still relatively high. These averages indicate that teachers' perceptions of the eTwinning Portal are highly positive.

Table 3

Descriptive Statistics of Teachers' Demographic Characteristics

	N Statistic	Mean Statistic	Std. Deviation Statistic	Skewness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
Gender	155	1.74	.439	-1.11	.19	-.76	.38
Age	155	2.70	1.22	.32	,19	-.86	.38
Education	155	1.94	.451	.15	.19	4.06	.38
Professional seniority	155	2.81	1.09	-.45	.19	-1.11	.38
Branch	155	3.55	2.09	.51	.19	-1.17	.38
Institution type	155	2.37	.83	.33	.19	-.40	.38

In addition, skewness and kurtosis values were examined to determine the normal distribution of different groups within the sample (Table 3). If these values fall within the range of ±2, they are considered acceptable (George & Mallery, 2010). Since the skewness and kurtosis values for the variables of gender, age, professional seniority, branch, and institution type were within ±2, parametric tests were applied. For the education level variable, which fell outside of this range, a non-parametric test was used.

Table 4

Independent Samples t-Test Results for Gender

	Group	N	Mean	Std. Deviation	t	df	p
Total	Male	40	47.85	13.70	-.48	153	.62
	Female	115	49.03	13.01			
Entrepreneurship	Male	40	33.50	9.52	-.79	153	.43
	Female	115	34.80	8.73			
Participation	Male	40	14.35	5.31	.12	153	.90
	Female	115	14.23	5.48			

As shown in Table 4, an independent samples t-test was conducted for the gender variable, and no significant difference was found at the $p < .05$ level at all dimensions of the scale. Based on these results, we can say that gender is not a significant variable.

Table 5
ANOVA Test Results for Age

	Groups	N	Mean Rank		Sum of Squares	df	Mean Square	F	Sig.
Total	22-29	28	47.75	Between Groups	1170.10	4	292.52	1.72	.14
	30-35	48	50.81	Within Groups	25494.96	150	169.96		
	36-41	37	51.00	Total	26665.07	154			
	42-47	27	43.55						
	48 age and above	15	47.53						
	Total	155	48.72						
Entrepreneurship	22-29	28	34.71	Between Groups	525.98	4	131.49	1.67	.15
	30-35	48	35.47	Within Groups	11758.57	150	78.39		
	36-41	37	35.83	Total	12284.55	154			
	42-47	27	30.59						
	48 age and above	15	34.33						
	Total	155	34.46						
Participation	22-29	28	13.03	Between Groups	189.65	4	47.41	1.64	.16
	30-35	48	15.33	Within Groups	4330.02	150	28.86		
	36-41	37	15.16	Total	4519.67	154			
	42-47	27	12.96						
	48 age and above	15	13.20						
	Total	155	14.25						

As shown in Table 5, an ANOVA test was conducted for the age variable, and no significant difference was found at the $p < .05$ level at all dimensions of the scale. Based on these results, we can say that age is not a significant variable.

Table 6

Kruskal-Wallis Test Results for Education Level

	Groups	N	Mean Rank	df	X^2	p
Total	Assoc.	20	86.28	3	2.38	.49
	BA	126	75.48			
	MA	8	95.69			
	PhD	1	89.00			
	Total	155				
Entrepreneurship	Assoc.	20	83.83	3	1.46	.69
	BA	126	76.08			
	MA	8	92.75			
	PhD	1	85.50			
	Total	155				
Participation	Assoc.	20	84.70	3	1.22	.74
	BA	126	76.18			
	MA	8	89.94			
	PhD	1	77.50			
	Total	155				

As shown in Table 6, a Kruskal-Wallis test was conducted for the education level variable, and no significant difference was found at the $p < .05$ level at all dimensions of the scale. Based on these results, we can say that education level is not a significant variable.

Table 7

ANOVA Test Results for Professional Seniority

	Groups	N	Mean Rank		Sum of Squares	df	Mean Square	F	Sig.
Total	1-5 year	28	47.07	Between Groups	309.64	3	103.21	.59	.62
	6-10 year	26	50.03	Within Groups	26355.43	151	174.53		
	11-15 year	48	50.27	Total					
	16 year and above	53	47.54		26665.07	154			
	Total	155	48.72						

	Groups	N	Mean Rank		Sum of Squares	df	Mean Square	F	Sig.
Entrepreneurship	1-5 year	28	34.35	Between Groups	106.43	3	35.47	.44	.72
	6-10 year	26	35.07	Within Groups	12178.12	151	80.65		
	11-15 year	48	35.35	Total					
	16 year and above	53	33.41		12284.55	154			
	Total	155	34.46						
Participation	1-5 year	28	12.71	Between Groups	101.25	3	33.75	1.15	.33
	6-10 year	26	14.96	Within Groups	4418.41	151	29.26		
	11-15 year	48	14.91	Total					
	16 year and above	53	14.13		4519.67	154			
	Total	155	14.25						

As shown in Table 7, an ANOVA test was conducted for the Professional seniority variable, and no significant difference was found at the $p < .05$ level at all dimensions of the scale. Based on these results, we can say that seniority is not a significant variable.

Table 8

ANOVA Test Results for Branch

	Groups	N	Mean Rank		Sum of Squares	df	Mean Square	F	Sig.
Total	Preschool teacher	21	54.04	Between Groups	1077.22	6	179.53	1.03	.40
	Primary school teacher	54	49.42	Within Groups	25587.84	148	172.89		
	Math teacher	14	47.35	Total	26665.07	154			
	Science teacher	10	48.80						
	English teacher	25	47.96						
	Computer teacher	3	43.66						
	Other	28	45.25						
	Total	155	48.72						

	Groups	N	Mean Rank		Sum of Squares	df	Mean Square	F	Sig.
Entrepreneurship	Preschool teacher	21	37.66	Between Groups	397.11	6	66.18	.82	.55
	Primary school teacher	54	34.57	Within Groups	11887.44	148	80.32		
	Math teacher	14	34.00	Total	12284.55	154			
	Science teacher	10	33.70						
	English teacher	25	34.92						
	Computer teacher	3	33.66						
	Other	28	32.03						
	Total	155	34.46						
Participation	Preschool teacher	21	16.38	Between Groups	254.12	6	42.35	1.47	.19
	Primary school teacher	54	14.85	Within Groups	4265.55	148	28.82		
	Math teacher	14	13.35	Total	4519.67	154			
	Science teacher	10	15.10						
	English teacher	25	13.04						
	Computer teacher	3	10.00						
	Other	28	13.21						
	Total	155	14.25						

As shown in Table 8, an ANOVA test was conducted for the branch variable, and no significant difference was found at the $p < .05$ level. For the institution type variable, an ANOVA test revealed a significant difference at the $p < .05$ level.

Table 9

Scale Total Group Mean Scores for Institution Type

Institution type	Mean	N	Std. Deviation
Kindergarten	52.05	19	16.37
Primary school	50.51	76	12.93
Middle school	47.20	43	12.31
High school	40.82	17	8.99
Total	48.72	155	13.15

As it can be seen in Table 9, in terms of institution type, the average scores obtained from the "eTwinning Portal Opinion Scale" (EPOS) are highest for kindergartens and lowest for high schools.

Table 10

ANOVA Test Results for Institution Type

		Sum of Squares	df	Mean Square	F	Sig.
Total	Between Groups	1613.55	3	537.85	3.24	.02*
	Within Groups	25051.52	151	165.90		
	Total	26665.07	154			
Entrepreneurship	Between Groups	664.52	3	221.50	2.87	.03*
	Within Groups	11620.02	151	76.95		
	Total	12284.55	154			
Participation	Between Groups	208.44	3	69.48	2.43	.06
	Within Groups	4311.23	151	28.55		
	Total	4519.67	154			

As shown in Table 10, ANOVA results for the institution type variable indicated a significant difference between teachers' mean EPOS scores, as well as their scores on the Entrepreneurship sub-dimension.

The homogeneity test indicated that the variances were distributed homogeneously. To determine where the differences lay among institution types, the Tukey post-hoc test was applied at all dimensions of the scale. Based on these results, we can say that institution type is not a significant variable.

Table 11

Post-Hoc Tukey Test for Institution Type

Dependent Variable	(I) Institution type	(J) Institution type	Mean Difference (I-J)	Std. Error	Sig.
Total	Kindergarten	Primary school	1.53	3.30	.96
		Middle school	4.84	3.54	.52
		High school	11.22*	4.30	.04
	Primary school	Kindergarten	-1.53	3.30	.96
		Middle school	3.30	2.45	.53
		High school	9.68*	3.45	.02

Dependent Variable	(I) Institution type	(J) Institution type	Mean Difference (I-J)	Std. Error	Sig.
Entrepreneurship	Kindergarten	Primary school	.85	2.25	.98
		Middle school	3.13	2.41	.56
		High school	7.05	2.92	.08
	Primary school	Kindergarten	-.85	2.25	.98
		Middle school	2.27	1.67	.52
		High school	6.20*	2.35	.04

* $p < .05$

As shown in Table 11, the Tukey post-hoc test results revealed that the mean total EPOS scores of preschool teachers were higher than those of high school teachers. Based on teachers' total EPOS scores, primary school teachers were also found to hold more positive views of the eTwinning Portal compared to secondary school teachers.

According to Tukey test results on the Entrepreneurship sub-dimension, primary school teachers expressed more favorable views of the eTwinning Portal compared to high school teachers. However, no statistically significant difference was found among teachers' scores on the Participation sub-dimension of the EPOS. As a general recommendation, Cohen stated that a "d" value less than 0.2 indicates a weak effect size, 0.5 indicates a moderate effect size, and a value greater than 0.8 indicates a strong effect size (Cohen, 1988).

The effect sizes between groups for the average scores teachers obtained on the EPOS scale were calculated for each group based on institution type. The effect size between kindergarten and high school was found to be d-Cohen (-0.83). The effect size between elementary school and high school was found to be d-Cohen (-1). As the effect sizes of the institution type groups are larger than 0.8, it can be said that the correlation is strong.

Discussion and Conclusions

Discussion

Based on research results, the mean score of teachers on the eTwinning Portal Opinion Scale (EPOS) perceptions is high. When we checked entrepreneurship and participation of the e-Twinning portal sub dimensions score were relatively positive which can still be considered relatively high. These results show that teachers' perceptions of the eTwinning Portal are largely positive. Similarly, the literature indicates that the great majority of teachers are willing to participate in eTwinning projects (Acar & Peker, 2021; Aktepe et al., 2025; Başaran et al., 2020; EU, 2022; EU, 2023; Gajek, 2022;

Gökbulut, 2023; Kaplan & Alkan, 2023; Kaya & Şad, 2025; Özen & Çıray Özkara, 2023; Şahin et al., 2024; Şenel & Han, 2024). The research results confirm that teachers generally have positive opinions about the eTwinning Portal, are generally positive, and that the majority of them display an inclination to engage; it can be argued that the results of this study correspond with those of other studies and that teachers' opinions about the eTwinning portal are generally positive.

The willingness of teachers to collaborate with each other supports entrepreneurial behavior (Baum & Locke, 2004; Gajek, 2021; Ho & Lee, 2023; Peltonen, 2015; Avcı, 2021), and it has been stated that project, design, and material development skills are crucial for their capacity of innovation, which in turn fosters their entrepreneurial tendencies (Uaidullakyzy et al., 2022; Avcı, 2021). According to another study, teachers believe that eTwinning projects contribute to their socialization, entrepreneurship, creativity, language skills, and technology (Demir et al., 2023). These aspects can be said to facilitate entrepreneurial behaviors among teachers. In this study, the high level of positive opinions expressed by teachers regarding the entrepreneurship dimension is consistent with the findings reported in the literature.

No significant difference was found between teachers' EPOS scores in terms of gender. Gökbulut (2023) reached a similar finding, stating that there was no significant difference in terms of gender among teachers with high levels of digital literacy in Turkey and EU member countries participating in the eTwinning network. In contrast, Döger and Kurnaz (2022) concluded that female teachers with a "quality label" were more successful in using technology in eTwinning projects. Özen and Çıray Özkara (2023) found that there were gender differences in favor of women in terms of variables such as educational technology competence, pedagogical competence, and ethical competence.

According to the research results, the average total scores of teachers on the "eTwinning Portal Opinion Scale" (EPOS) indicate that preschool teachers scored higher than high school teachers. Depending on teachers' overall EPOS scores, preschool teachers view the eTwinning Portal more positively than secondary school teachers. Based on the effect size value, it was found that preschool teachers had a stronger positive opinion of the eTwinning Portal than secondary school teachers.

According to the results in the entrepreneurship sub-dimension, primary school teachers expressed more positive views about the eTwinning Portal than high school teachers. It was observed that the difference between primary school teachers and secondary school teachers had a strong effect value depending on the effect size value. Based on this result, it can be suggested that primary school teachers interact more with the eTwinning Portal than high school teachers.

The results of the ANOVA test for the scores obtained in terms of the type of institution where teachers work are presented. A notable difference was observed between the average scores of the "eTwinning Portal Opinion Scale" (EPOS) and the total scores

of teachers according to their institution types and (Entrepreneurship) sub-dimension scores. A review of the current literature reveals that the majority of teachers tend to engage in eTwinning projects for their professional development (Bacescu, 2016; Bozdağ, 2018; EU, 2022; Gajek, 2018). Entrepreneurship, one dimension of this scale, is understood to be closely related to creativity (Sezen Gültekin et al., 2023). As creativity is also one of the most important subjects for pre-school and primary school education, and developing these skills is very important at these educational levels, it can be stated that teachers also focus on these project groups.

The findings also showed that preschool teachers had higher overall average EPOS scores compared to secondary school teachers. Based on EPOS scores, primary school teachers also had more positive opinions about the eTwinning Portal compared to secondary school teachers. Studies examining the data by institution type also found that preschool and primary school teachers had more positive opinions than secondary school teachers (Döger & Kurnaz, 2022).

The findings of this study demonstrate that teachers' perceptions of the eTwinning Portal are largely positive, with notable differences based on institution type. The analysis also revealed that, overall, teachers have a broadly favorable perception of the eTwinning Portal. The higher scores of preschool and primary school teachers compared to their counterparts in other institutions may be attributed to the distinctive characteristics of their institutions. These characteristics could be associated with processes in pre-service training.

As stated by Başar & Ada's (2023) research, teachers' levels of technological knowledge (TC) varied depending on their branches; primary school teachers and English teachers working as classroom teachers had greater TC levels than teachers in other branches. According to another study, it was reported that preschool and primary school teachers used technology more effectively in eTwinning projects than their colleagues (Döger & Kurnaz, 2022). However, in this study, no significant differences were found in teachers' EPOS scores across subject branches. According to the findings, no significant differences were observed in teachers' opinions on the eTwinning Portal in relation to educational background or professional seniority. Numerous research studies in the literature corroborate this conclusion (Acar & Peker, 2021; Aktepe et al., 2025; Başaran et al., 2020; EU, 2022; EU, 2023; Gajek, 2022; Gökbulut, 2023; Kaplan & Alkan, 2023; Kaya & Şad, 2025; Özen & Çıray Özkara, 2023; Şahin et al., 2024; Şenel & Han, 2024).

Conclusion & Recommendations

The results of this study reveal that teachers' opinions of the eTwinning Portal are generally positive and that the majority show a tendency to participate. Research examining teachers' opinions by institution type indicates that preschool and primary school teachers hold more favorable opinions than high school teachers. It can therefore be suggested that high school teachers perceive the eTwinning Portal less

positively than their preschool and primary counterparts, although such results may vary depending on the educational systems of different countries.

This situation may be attributed to challenges arising from curriculum and administrative factors. In particular, the limited and irregular lesson hours in high school curricula may reduce high school teachers' motivation to engage with the eTwinning Portal. By contrast, preschool and primary school teachers spend a larger portion of their working time within the school environment, which facilitates stronger motivation and a more positive outlook toward the Portal. The findings also suggest a positive correlation between teachers' favorable views of the eTwinning Portal, their participation in it, and their entrepreneurial tendencies. However, this study does not provide substantial evidence regarding participation in international projects. Entrepreneurship is understood to be closely related to creativity, and this project can help pre-school and primary teachers to develop these skills. That's why I have more interest from preschool and primary school teachers.

To better examine the relationship between teachers' participation in the eTwinning Portal and their entrepreneurial inclinations, further studies using diverse research methods and variables are recommended. The generalizability of the present findings is limited by the small-scale qualitative data. Therefore, large-scale quantitative studies could be conducted in the future. In addition to determining teachers' views on the eTwinning portal, qualitative research could also be employed to identify the challenges they face.

To enhance teachers' engagement with the eTwinning portal and its projects, in-service training and promotional activities may be planned. Moreover, integrating training on the eTwinning Portal and its projects into the teacher education programs at the universities could allow prospective teachers to become familiar with the Portal and participate at earlier stages of their professional development.

Based on the research findings, it can be stated that the views of pre-school and primary school teachers regarding the e-Twinning portal are more positive than those of secondary school teachers. Undoubtedly, this result is consistent with observations in educational life. In Türkiye, the e-Twinning portal and projects are perceived as project activities carried out intensively by pre-school and primary school teachers. At the secondary school level, such project applications are not seen to a sufficient degree. It can be argued that the content of e-Twinning projects is more aligned with the pre-school and primary school levels. Therefore, researching how these project contents and applications can be aligned with secondary school level education programs can be suggested to other researchers.

In conclusion, it can be stated that teachers have a favorable attitude towards e-Twinning activities, which are among the innovative and entrepreneurial practices and project groups in the field of education, and that preschool and primary school teachers in particular have more positive views than other teacher groups. In this

particular case, it is feasible to state that these projects and innovative practices have paved the way for their widespread use at the preschool and primary school levels. It can be stated that these applications can be used as an important tool for developing preschool and primary school education in Türkiye with new educational methods and techniques appropriate to the conditions of the era.

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Mokytojų nuomonės apie „eTwinning“ portalą (Sakarijos provincijos pavyzdys)

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Santrauka

Šio tyrimo tikslas – išanalizuoti Sakarijos mokytojų nuomones apie „eTwinning“ portalą ir jo naudojimą atsižvelgiant į skirtingus veiksnius, įskaitant jų dėstomą dalyką, profesinę patirtį, lytį ir amžių. Tyrimas atliktas taikant apklausos metodą. Apklausoje buvo pateikti šeši klausimai, susiję su demografiniais rodikliais. Tyrimo dalyviai – skirtingų lygių mokyklų mokytojai iš penkių Sakarijos provincijos rajonų – atrinkti atsitiktinės imties būdu. Atliekant tyrimą buvo iškelti tokie klausimai: 1. Kokia yra mokytojų nuomonė apie „eTwinning“ portalą? 2. Ar mokytojų nuomonė apie „eTwinning“ portalą skiriasi priklausomai nuo dalyko srities, profesinės patirties, lyties, amžiaus, išsilavinimo ir įstaigos tipo? 3. Ar „eTwinning“ portalo nuomonių skalės“ vertinimai priklauso nuo verslumo ir dalyvavimo balų, kurie sietini su jų dėstomu dalyku, profesine patirtimi, lytimi, amžiumi, išsilavinimu ir įstaigos tipu? Tyrimo rezultatai atskleidė, kad mokytojai teigiamai vertina „eTwinning“ portalą. Lyčių skirtumams nustatyti buvo taikomas *t* kriterijus kuris statistiškai reikšmingų skirtumų neparodė. Amžiaus, profesinės patirties, mokytojo tipo ir įstaigos tipo poveikiui nagrinėti buvo taikoma dispersinė analizė (angl. *ANOVA, Analysis of Variance*), o išsilavinimo lygiui – Kruskalio ir Walliso kriterijus. Tarp šių kintamųjų, išskyrus įstaigos tipą, reikšmingų skirtumų nenustatyta.

Esminiai žodžiai: *verslumas, mokytojas, „eTwinning“ nuomonių skalė, profesinis tobulėjimas, švietimo technologijos, ES projektai.*

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