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The Relationship Between Teachers' Web 2.0 Tools Usage Competency Levels and Self-Efficacy Perceptions

Öğretmenlerin Web 2.0 Araçları Kullanım Yetkinlik Düzeyleri ve Öz-yeterlik Algıları Arasındaki İlişki

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ABSTRACT: The research aims to determine Web 2.0 tools usage levels of teachers teaching at preschool, primary and secondary school levels, in terms of school levels and educational backgrounds, and to reveal the possible relationship between teachers' use of Web 2.0 tools and their self-efficacy levels. The study comprised 203 instructors from Zonguldak province with various education levels and teaching at various school levels. The data in this study was collected through “Competency in Using Web 2.0 Tools" and "Teachers' Self-Efficacy Perceptions" scales. Correlation and two-factor ANOVA analyses were used to determine the outcomes after verifying the data's normal distribution and the scales' fit indices. According to the study's findings, scores on the "Web 2.0 Tools Usage Competency Scale" were higher in favor of teachers with a master's degree. It was concluded that teachers' usage levels of Web 2.0 tools were significantly related to classroom management, one of the sub-dimensions of the teachers' self-efficacy perception scale, and their educational level, one of the demographic characteristics of the teachers. Furthermore, when the self-efficacy measure sub-dimensions were examined, it can be concluded that teachers' levels of the use of Web 2.0 tools did not differ significantly by school level or educational level, but they did differ significantly in terms of classroom management. The research findings also offer suggestions.

Keywords: Web 2.0, self-efficacy perception, classroom management, teaching strategies, student participation

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ÖZ: Araştırmanın amacı, okul öncesi, ilköğretim ve ortaöğretim kademelerinde görevli öğretmenlerin Web 2.0 araçlarını kullanım düzeylerini okul türleri ve öğrenim durumları yönünden belirlemek ve öğretmenlerin Web 2.0 araçları kullanımlarıyla öz-yeterlik algı düzeyleri arasındaki olası ilişkiyi ortaya koymaktır. Araştırmaya, Zonguldak ilinde farklı öğrenim düzeyine sahip ve okul kademelerinde eğitim-öğretim faaliyetlerini sürdüren 203 öğretmen dahil edilmiştir. Araştırmada veri toplamak amacıyla "Web 2.0 Araçları Kullanımı Yetkinliği" ve "Öğretmenlerin Öz-yeterlik Algıları" ölçekleri kullanılmıştır. Verilerin normal dağılımları ve ölçeklerin uyum indisleri kontrol edildikten sonra sonuçlara korelasyon analizi ve iki faktörlü ANOVA analizleri kullanılarak ulaşılmıştır. Araştırma sonucunda, "Web 2.0 Araçları Kullanımı Yetkinliği Ölçeğinden" elde edilen puanların, öğretmenlerin öğrenim düzeyleri yönünden yüksek lisans derecesine sahip öğretmenler lehine daha yüksek düzeyde olduğu tespit edilmiştir. Öğretmenlerin Web 2.0 araçları kullanım düzeylerinin, öğretmenlerin öz-yeterlik algıları ölçeğinin alt boyutlarından sınıf yönetimi ve öğretmenlerin demografik özelliklerinden öğrenim durumları ile anlamlı düzeyde ilişkilendiği sonucuna ulaşılmıştır. Ayrıca, öz-yeterlik ölçeği alt boyutları kontrol edildiğinde, öğretmenlerin Web 2.0 araçları kullanım düzeyleriyle okul türü ve eğitim durumları yönünden anlamlı düzeyde farklılaşmazken, sınıf yönetimi açısından anlamlı düzeyde farklılaştığı sonucuna ulaşılmıştır. Araştırmanın bulguları doğrultusunda önerilere de yer verilmiştir.

Anahtar sözcükler: Web 2.0, öz-yeterlik algısı, sınıf yönetimi, öğretim stratejileri, öğrenci katılımı

1. INTRODUCTION

The use of materials in the learning environment has shown a series of changes from the past to the present. This process, which started with printed materials and blackboards, has changed in parallel with the development of technology. The introduction of television, radio, and musical instruments into human life has resulted in the use of these instruments in educational environments. The invention of the computer and its use in schools constituted the most important point of this development. With the beginning of the use of the internet together with the computer, important changes have occurred in the learning and teaching processes in parallel with the changes in human life. In today's world, thanks to the increase in the speed of the internet, the development of the ability to produce programs, and the availability of the internet and computers in every home and school, the use of technology in the learning and teaching process continues to change and develop rapidly (DoBell, 2013; Eroğlu, 2014). One of these technologies has taken its place in educational environments and processes as a Web 2.0 tool. Caladine (2008) characterizes Web 2.0 technologies as virtual personal learning environments that allow students to track and promote their learning. Web 2.0 tools consist of content syndication, podcasts, blogs, wikis, multimedia-sharing services and content tagging tools that can be used in the teaching process to facilitate and make learning permanent. By using these infrastructures, technology, which is developing day by day, contributes to the learning and teaching processes in the development of skills such as interpreting learning materials, writing articles and essays, sharing ideas, developing research and communication skills, thinking and commenting on their work and the work of others (Anderson, 2007).

In this context, a wide range of Web 2.0 tools are being implemented in learning environments with increasing frequency to involve students in the interaction of technology and course material. Figure 1 lists multiple applications that can be used with Web 2.0 tools in educational settings;

Animation Tools	Coding Tools	Class Management Tools
Survey Tools	Logo Design Tools	Presentation Tools
Storage and Filling Tools	Music and Audio Tools	Team and Group Building Tools
Digital Board Tools	Game Development Tools	Calendar, Chart Applications
E-Book Tools	Social Networking Sites	Text and Authoring Tools
Photography and Image Tools	Poster and Banner Tools	Video Conferencing Tools
Map Tools	Virtual Reality Tools	Video Tools
Caricature and Drawing Tools	Test and Exam Tools	Web Development Tools

Note. Adapted from "Web 2.0 Eğitimine Yönelik Gerçekleştirilen Bilimsel Bir Etkinliğin Değerlendirilmesi: Katılımcı Görüşleri," by Altıok, Yükseltürk ve Üçgül, 2017, *Journal of Instructional Technologies & Teacher Education*, *6*(1), p. 2.

Figure 1: *Basic Classification of Web 2.0 Tools*

While Web 2.0 tools are technology-supported platforms where individual users, who receive data from multiple sources, including other users, can learn by interacting with others, Web 2.0 applications offer software as a service that develops with the use of users and is constantly updated (Oreilly, 2005). Several research findings have also shown that integrating them into their environment has favorable effects. In fact, according to Akkaya (2019), students considered using Web 2.0 technologies enjoyable and helpful, aiding their learning. Web 2.0 tools also reportedly create productive learning environments for teaching and learning processes. Similarly, Köse (2010) reported that using Web 2.0 tools provides effective learning environments for learning and teaching processes. Prykhodko, Rezvan, Volkova, and Tolmachev (2019) also stated that the use of Web 2.0 tools in foreign language teaching contributes to the development of students' communication skills and technology use skills. Halim and Hashim (2019) reported that the use of Web 2.0 tools in the foreign language teaching process increases the foreign language proficiency levels of the students and is an effective method as a motivational tool. In summary, it can be stated that integrating Web 2.0 tools into teaching environments is important for facilitating learning, improving communication skills, facilitating learning environments, and creating motivation for learning.

Demonstrating the role of the self-efficacy variable in the process of integrating the use of Web 2.0 Tools, which is frequently reported to contribute to learning and motivation, and the integrating of developing technology into educational environments can more clearly reveal the effect of Web 2.0 tools on effective use in educational environments.

Self-efficacy is "the judgments of individuals about their ability to organize the necessary activities to show a certain performance and to achieve the relevant performance" (Bandura, 1997; 193). It is frequently reported that individuals with high self-efficacy levels are more successful in any task than individuals with low self-efficacy levels. Compared to individuals with low self-efficacy, individuals with high self-efficacy may have lower levels of stress and be more emotionally resistant to tasks (Bandura, 1997).

"Teacher efficacy, as a motivational construct, proposes that the level of efficacy affects the amount of effort a teacher will expend in teaching and the persistence a teacher will show in the face of obstacles" (Tschannen-Moran, Hoy, and Hoy, 1998). Teacher self-efficacy emerges as an important motivation variable for teachers to feel competent to cope with the difficulties they encounter in the teaching process and to develop and apply teaching methods and techniques. In this context, it can be said that the capacity of teachers to cope with the difficulties they encounter in their teaching processes and to have sufficient resistance to integration may have a positive or negative effect on integrating Web 2.0 tools into learning and teaching processes and their effective use. It is noteworthy that there are limited studies in the literature examining the relationship between teacher self-efficacy and Web 2.0 tool use. It can be said that the studies in the literature are mostly discussed within the scope of teachers' usage levels of Web 2.0 tools, features of the tools and demographic variables (Behçet and Söylemez, 2013; Eser, 2020; Eyüp, 2022), but the variables that may have a possible impact on teachers' Web 2.0 usage levels are not included at a sufficient level. Self-efficacy beliefs, defined as the capacity to judge their possible competencies in any field (Bandura, 1997), emerged as a variable that should be investigated for their possible impact on teachers' usage levels of Web 2.0 tools. A similar series of studies also mention the effect of self-efficacy on the use of Web 2.0 tools. For instance, Sadaf, Newby and Ertmer (2016) stated that the best indicators of preservice teachers' intentions and actual usage of Web 2.0 tools in the classroom were perceived usefulness, self-efficacy, and student expectations. For instance, Sadaf, Newby and Ertmer (2016) stated that the best indicators of preservice teachers' intentions

and actual usage of Web 2.0 tools in the classroom were perceived usefulness, self-efficacy, and student expectations. Pan and Farnklin (2011) reported that self-efficacy perception, professional development and school administration support were strong predictors of Web 2.0 tool use. Similarly, Alhassan (2017) indicated that there is a strong and significant relationship between teachers' self-efficacy and Web 2.0 usage levels and the use of modern internet tools should be included in in-service training. Since teacher self-efficacy is a significant factor in determining instructors' motivation and level of effort during the teaching process (Ashton and Web, 1986) and raising instructors' Web 2.0 usage levels helps them meet curriculum objectives (Atalmış and Şimşek, 2022; Light and Polin, 2010), determining if self-efficacy is a meaningful variable in raising instructors' use of Web 2.0 tools is deemed important in this context. A higher degree of self-efficacy among educators may be associated with their use of Web 2.0 tools. Therefore, positive self-efficacy perceptions, educational background, and some other variables may be a prerequisite for the effective use of Web 2.0 tools usage of teachers. Based on the findings of some research in the literature (Özpınar, 2020; Polin, 2010; Yıldırım, 2023), the research also seeks to identify the potential direction of the association between instructors' levels of self-efficacy and their use of Web 2.0 tools. Another important aspect of the research is that it reveals how teachers' educational backgrounds and school levels change when their self-efficacy beliefs are controlled. In this context, the research aim was to reveal the relationship between teacher self-efficacy sub-dimensions and the use of Web 2.0 tools, and the research questions were formed as follows :

1. What is the mean score of teachers' use of Web 2.0 tools?

2. Is there a significant relationship between the sub-dimensions of teachers' self-efficacy perception levels, school levels, educational background, and their Web 2.0 tool usage levels?

3. Does teachers' Web 2.0 tools use differ according to teachers' education levels and school level when the sub-dimensions of teaching self-efficacy are controlled?

2. METHOD

2.1. Research Design

The correlational research model was applied in this study. The goal of the relational research approach is to ascertain whether or how much two or more variables have changed collectively (Karasar, 2005). The correlational research model was determined to reveal the relationship between the variables and sub-dimensions of the scales included in the research questions. To find answers to the research questions within the scope of the correlational research model, first, the average scores obtained from the scales were presented. Subsequently, the relationship between the research variables was determined to determine the possible relationship between the research variables. Finally, the possible effects of the self-efficacy scale sub-dimensions, which are among the variables that have a possible relationship with the dependent variable, were examined. According to the analysis methods, a simple random sampling approach was adopted in the study since it helps represent a sample from an easily accessible population and allows for every participant to have an equal probability of being included in the sample.

2.2. Participants

The population of the study consists of the teachers working in Zonguldak. The data of the study were collected from 203 participants working as teachers in different branches and at the school level in the province of Zonguldak under the Ministry of National Education. 162 teachers have

Bachelor's degrees and 41 teachers have master's degrees. The sample consists of 86 female and 117 male teachers. In addition, the sample of the study consists of 42 teachers with 1-9 years of seniority, 58 with 10-19 years of seniority, 77 with 20-29 years of seniority, and 26 with 30 years of seniority or more. The distribution of the teachers who constitute the sample of the study in terms of the variables investigated in the study is presented in Table 1.

Table 1: *Distribution of The Teachers Participating İn The Study*

Education status	**n**	**School Level**	**n**
Bachelor's degree	162		
Master's degree	41		
		Kindergarten	10
		Primary School	53
		Secondary School	51
		High School	89
Total	203		203

2.3. Data Collection Tools

"Teacher Self-Efficacy Perception Scale-Short Form" adapted into Turkish by Karaoğlu (2019) and "Web 2.0 Tools Competency Scale" developed by Çelik (2020) were used to collect the data. In the study, confirmatory factor analyses (CFA) were conducted to test the internal consistency reliability (Cronbach's Alpha) of the scales, as well as the construct validity and sample fit. "CFA is an analysis in which a previously defined and constrained construct is tested whether it is validated as a model." (Büyüköztürk, Şekercioğlu, and Çokluk, 2012: 275). For CFA, the highest likelihood (Maximum Likelihood) method was used with the statistical software program AMOS 21 (Arbuckle, 2012) and it was carried out considering the modification indices. The degrees of agreement between the observed data in the CFA and the factor structures are Comparative Fit Index (CFI ≥ .90), Standardized Root Mean Square Errors (SRMR ≤ .08), and Root Mean Square Errors of Approximation (RMSEA ≤ .1), Tucker-Lawis Index (TLI ≥ . 90) was evaluated through. A good fit is defined as an RMSEA value of 0.05 or less, an adequate fit is 0.08 or less, an acceptable fit is 0.08 to 1 or more, and an unacceptable fit is greater than 1. (Hu and Bentler, 1999; Schermelleh-Engel, Moosbrugger, and Müller, 2003).

2.3.1. *Teacher Self-Efficacy Perception Scale-Short Form*

The scale consists of three sub-dimensions: Student Engagement (SE), Instructional Strategies (IS) and Classroom Management (CM) and 12 items in a 9-point Likert type (1= not at all and 9= a lot). Considering the sample structure of the research as a result of CFA, it was concluded that the factor structure of the "Teacher Self-Efficacy Perception Scale-Short Form" was confirmed for the data of the research. As a result of DFA; $\chi 2$ (659) = 2, 93; CFI = .90; TLI = .89; RMSEA = .090; SRMR = 0.040 calculated. On the other hand, scale items predict the relevant factor with standardized Beta values ranging from 0.47 to 0.83 ($p < .05$) (see Figure 2). The Cronbach's alpha total reliability coefficient of the scale was found to be .91. The reliability coefficient of the SE sub-dimension of the scale was .84;

IS sub-dimension reliability coefficient was.76; The reliability coefficient of the CM sub-dimension was calculated as .84.

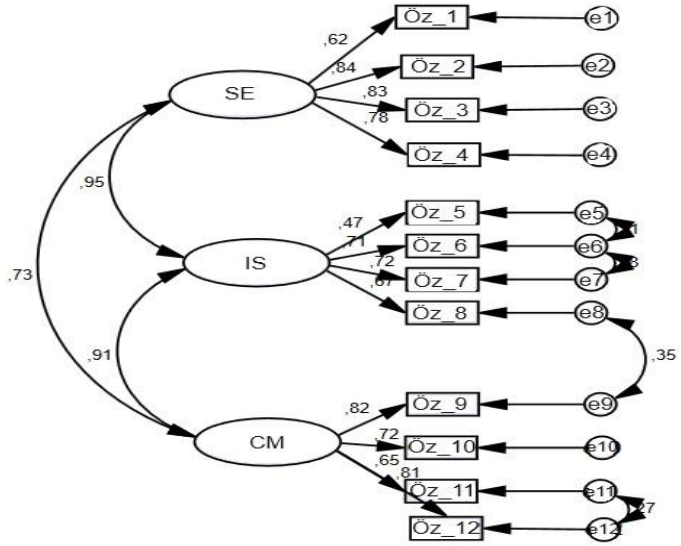

Figure 2: *Self-efficacy Scale Confirmatory Factor Analyses*

2.3.2. *Web 2.0 Tools Competency Scale*

The "Web 2.0 Tools Competency Scale" developed by Çelik (2020) is a one-dimensional measurement tool consisting of 39 items in a 5-point Likert type (1 = never and 5 = always). Çelik (2020) did not set a threshold score for the evaluation of the scale, but the high scores indicate high levels of use of Web 2.0 tools; low scores that the level of use is low. The scale yields 39 as the lowest possible score and 195 as the greatest possible score. In the first analysis, it was determined that the factor loadings of the Web 2.0 usage scale had high values. Still, some of the fit indices were found to have low values and some modifications were made for the confirmatory factor analyses. Due to the high factor loadings of the items in the single-factor dimension of the scale, the scale did not show the expected compatibility with the research sample, and therefore the necessary modifications were made. Although the factor loadings of the scale are at high levels, the reason for the low fit indices can be explained by the concept of over-factoring. The degree of over-factoring is related to the size of the factor loadings, with higher factor loadings being linked to a higher chi-square value and, thus, a worse fit (Olsson, 1979). Considering the sample structure of the research as a result of CFA, it was concluded that the "Web 2.0 Tools Competency Scale" factor structure was confirmed for the research data. As a result of DFA; $\chi 2$ (47) = 2, 93; CFI = .90; TLI = .89; RMSEA = .095; SRMR = 0.040 calculated. On the other hand, scale items predict the relevant factor with standardized Beta values ranging from 0.61 to 0.84 ($p < .05$) (see Figure 3). The scale's Cronbach's alpha total reliability coefficient was .91. The reliability coefficient of the SE sub-dimension of the scale was .84; IS sub-dimension reliability coefficient was.76; The reliability coefficient of the CM sub-dimension was calculated as .84. The Cronbach's alpha total reliability coefficient of the scale was .99.

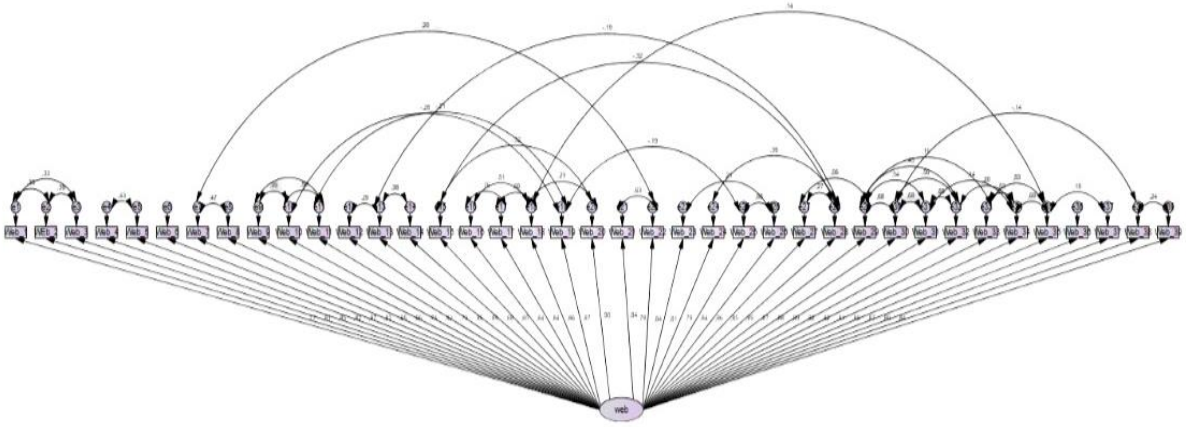

Figure 3: *Web 2.0 Tools Competency Scale Confirmatory Factor Analyses*

2.4. Data Collection Process

The data included in the research were obtained through the "Teacher Self-Efficacy Perception Scale-Short Form" and the "Web 2.0 Tools Competency Scale" using electronic Google forms were used to collect data.

2.5. Analyzing The Data

The normal distribution of the data was initially investigated in order to answer the research questions using descriptive statistics of the data. Initially, Levene's Test was used to check if the two-ANOVA from the research analysis satisfied the normality assumption. It was found that, in terms of school categorization, the homogeneity of variances was not guaranteed for the usage of Web 2.0 tools and classroom management variables, as shown in Table 2. Descriptive analysis was used to evaluate whether the factors regarding classroom management and the use of Web 2.0 tools were appropriate for two-way ANOVA. Descriptive approaches include analyzing the distribution of data using statistics such as the arithmetic mean, mode, median, skewness, and kurtosis factors. Evidence of a normal distribution includes the arithmetic mean, mode, and median being equal or close to each other, the skewness and kurtosis coefficients being close to 0 within the range of ±1, and the skewness and kurtosis indices, which are determined by dividing the skewness and kurtosis coefficients by their standard errors, being close to 0 within the range of ±2 (Abbott, 2011; Büyüköztürk, Çokluk-Bökeolu and Köklü, 2006; Kirk, 2008; Morgan, Leech, Gloeckner, and Barrett, 2004; Patel and Read, 1996). It was determined that the kurtosis and skewness values were between ±1for the usage of Web 2.0 tools and classroom management variables in terms of school level, and the mode, median, and mean values of the data were found to be close to each other and the data are presented in Table 3. Pearson correlation analysis was applied to determine the strength and direction of the relationship between the variables considered within the scope of the research and to form the basis for subsequent analysis. The researcher can investigate the impact of each independent variable as well as the interactions between them using two-way ANOVA (Cohen, Lawrence and Morrison, 2007). Two-way ANOVA was conducted to check the possible effects of the study's educational classification and educational level on the dependent variable within the scope of their possible relationship with the self-efficacy sub-dimension.

Table 2: *Analysis Results of Assumptions*

		F	df1	df2	p
Web 2.0 Tools Usage	Educational Level	.840	3	199	.473
Student Participation		1.652	3	199	.179
Teaching Strategies		.528	3	199	.664
Classroom Management		.639	3	199	.590
Web 2.0 Tools Usage	School Level	4.145	1	201	.043
Student Participation		.871	1	201	.352
Teaching Strategies		.270	1	201	.604
Classroom Management		5.430	1	201	.021

Table 3: *Descriptive Analysis in terms of School Level*

Scales	**Sub-scales**	**Variables**	**n**	**mod**	$\overline{x}$	**median**	**skewness**	**kurtosis**
Web 2.0	Web 2.0	Kindergarten	10	2.05	3,03	1,98	.102	-1,131
		Primary School	53	2.09	2	2	.636	-.083
		Secondary School	51	2.21	1	2.02	.964	.477
		High School	89	2.18	1	2.02	.809	.391
Self-Efficacy	Clasroom Management	Kindergarten	10	7.77	7	7.75	-.909	.092
		Primary School	53	7.66	8	8	-.667	.156
		Secondary School	51	7.16	6.75	7	.144	-.776
		High School	89	7.45	7.25	7.50	-2.90	-239

3. FINDINGS

The answers to the first question of the research are presented in Table 4. As seen in Table 4, it was concluded that the mean of Web 2.0 tool usage by teachers with a bachelor's degree ($\overline{x}$=2.09, SD = .85) and the mean of Web 2.0 tools usage by teachers with a master's degree ($\overline{x}$=2.44, SD = 1). Also, it was found that among the sub-dimensions of the teacher self-efficacy scale, in terms of the student participation dimension mean score for teachers with a bachelor's degree ($\overline{x}$=7.82, SD = .95), for teachers with a master's degree ($\overline{x}$=7.81, SD = .95); in terms of the teaching strategies sub-dimension, the mean score for teachers with a bachelor's degree ($\overline{x}$=7.88, SD = .77), for teachers with a master's degree ($\overline{x}$ = 7.85, SD = .84); in terms of classroom management dimension the mean score for teachers with a bachelor's degree ($\overline{x}$=7.44, SD = 1.01) and the mean score for teachers with a master's degree ($\overline{x}$=7.47, SD = .78).

On the other hand, the means of Web 2.0 tools usage were calculated for kindergarten teachers as ($\overline{x}$= 2.05, SD = .76), primary school teachers as ($\overline{x}$=2.09, SD = .83), secondary school teachers as ($\overline{x}$= 2.21, SD = 1.02) and high school teachers as ($\overline{x}$=2.18, SD = .94). The teachers' mean scores in terms of student participation sub-dimension are calculated as for kindergarten teachers ($\overline{x}$=8.37, SD = .77), primary school teachers ($\overline{x}$ = 8.24, SD = .77), secondary school teachers ($\overline{x}$ =7.31, SD = .91), and high school teachers ($\overline{x}$=7.80, SD = .99), It was also found that in terms of the teaching strategies, sub-dimension mean scores calculated as for kindergarten teachers ($\overline{x}$=7.88, SD = .84), primary school teachers ($\overline{x}$= 8.06, SD = .72), secondary school teachers ($\overline{x}$= 7.61, SD = .83) and high school teachers ($\overline{x}$=7.90, SD = .75), and in terms of classroom management sub-dimension mean scores for kindergarten teachers ($\overline{x}$=7.77, SD = 1.16), primary school teachers ($\overline{x}$=7.66, SD = .94), for secondary school teachers ($\overline{x}$=7.16, SD = 1), and high school teachers ($\overline{x}$=7.45, SD = .90).

Table 4: *Descriptive Statistics in terms of Education Level and School Status*

		Dependent and Independent Variables	**n**	$\overline{x}$	**SD**
Educational Level	Bachelor's Degree	Web 2.0	162	2.09	.85
		Student Participation	162	7.82	.95
		Teaching Strategies	162	7.88	.77
		Classroom Management	162	7.44	1.01
	Master's Degree	Web 2.0	41	2.44	1
		Student Participation	41	7.81	.95
		Teaching Strategies	41	7.85	.84
		Classroom Management	41	7.47	.78
School Level	Kindergarten	Web 2.0	10	2.05	.76
		Student Participation	10	8.37	.77
		Teaching Strategies	10	7.88	.84
		Classroom Management	10	7.77	1.16
	Primary School	Web 2.0	53	2.09	.83
		Student Participation	53	8.24	.77
		Teaching Strategies	53	8.06	.72
		Classroom Management	53	7.66	.94
	Secondary School	Web 2.0	51	2.21	1.02
		Student Participation	51	7.31	.91
		Teaching Strategies	51	7.61	.83
		Classroom Management	51	7.16	1
	High School	Web 2.0	89	2.18	.94
		Student Participation	89	7.80	.99
		Teaching Strategies	89	7.90	.75
		Classroom Management	89	7.45	.90

Correlation analysis was conducted to answer the second question of the research and the analysis results are presented in Table 5.

Table 5: *Correlation Analyses Between The Variables*

	Web 2.0 Tools Usage	**Student Participation**	**Teaching Strategies**	**Classroom Management**	**Educational Status**	**School Type**
Web 2.0 Tools Usage	1	.027	.027	.154*	.153	.043
Student Participation		1	.748**	.608**	-.007	-188**
Teaching Strategies			1	.728**	-.018	-.082
Classroom Management				1	.011	-.093
Educational Status					1	.153*

p < .01; p < .05

As a result of the correlation analysis, it was concluded that the dependent variable of the study, the level of Web 2.0 tools usage, and the self-efficacy sub-dimensions of classroom management and educational level variables (r = .154: p < .05) were significantly positively correlated (r = .154; p < .05). .05). On the other hand, teachers' usage levels of Web 2.0 tools did not show a significant relationship with teaching strategies (r = .027; p > .05) and student participation sub-dimension (r = .027; p > .05).

To answer the third question of the research two-way ANOVA was used. Therefore, the classroom management variable, which showed a significant relationship with the dependent variable, was included in the analysis as a covariate variable (r = .157; p < .05), and the educational level, which did not show a significant relationship with the covariant variable (F(1, .024) = .023, p > .05), was included in the analysis as a factor variable. The school-level variable was also included as a random variable. Levene Test analysis was performed to test the homogeneity of the data for the variables added in the two-way ANOVA. (F(7, 195) = 1.829, p = .084) and the result is also presented in Table 6.

Table 6. *Levene's Test Result*

	F	**df 1**	**df 2**	**p**
Web 2.0 Tools Usage	1.829	7	195	0.084

p >.05

Table 7. Two-Way Analyses of Variance for Web 2.0 Tools Usage

Variables	**Type III Sum of Squares**	**df**	**Mean Square**	**F(1, 2636)**
Classroom Management	5.439	1	2.636	5.439*
Educational Level	1.092	1	1.092	.975
School Level	4.333	3	1.444	.955
Educational Level and School Level	4.555	3	5.118	1.854

p < .05

As a result of the analysis, it was concluded that the classroom management variable was significantly associated with the level of Web 2.0 Tools usage, ($F(1,_{5.439})$) when the sub-dimensions of teaching self-efficacy are controlled. When the classroom management variable, one of the sub-dimensions of the self-efficacy scale, was controlled, it was concluded that the education level and classroom management variables did not positively affect the teachers' level of use of Web 2.0 tools. Therefore, when teachers' education levels and school levels are controlled for the classroom management self-efficacy variable, it can be concluded that they do not have a positive effect on the usage levels of Web 2.0 tools. It can be concluded that the classroom management self-efficacy sub-dimension, together with its interaction with teachers' education levels and school levels, affects teachers' Web 2.0 usage levels. On the other hand, it was concluded that education level, school level and education level and school level together were not significantly related to the level of Web 2.0 tools usage.

4. DISCUSSION and RESULT

According to the findings of the study, teachers' use of Web 2.0 tools is below average in terms of both bachelor's and master's degrees, as well as school level. As a result, teachers with a master's degree are more likely to use Web 2.0 resources than teachers with a bachelor's degree. On the other hand, secondary school teachers have the highest Web 2.0 tool use score while kindergarten teachers have the lowest. The research findings indicate that teachers possessing a master's degree use Web 2.0 tools at a higher rate than teachers with a bachelor's degree. This suggests that master's degree holders are more familiar with Web 2.0 tools and that their degree may play a role in their ability to use and understand them. Numerous research findings supporting this circumstance are possibly found in the literature. As an instance, Aksoy (2023) stated that teachers' usage levels of Web 2.0 tools were partially average and mostly below average in terms of educational level. Similar findings were made by Yağcı and Şentürk (2023), who found that master's degree holders used Web 2.0 at much higher rates than bachelor's degree holders. According to Yıldırım (2023) and Eyüp (2022), teachers possessing a graduate degree exhibit higher levels of Web 2.0 tool utilization compared to their bachelor's degree counterparts. Similar to the results of the research, it has been widely documented that teachers use Web 2.0 technologies at low levels in the majority of the results produced from the research conducted in the literature. For example, Horzum (2010) also reported that teachers are aware of some of the Web 2.0 tools, but they generally use the tools for entertainment and communication purposes. Dönmez, Güntepe, and Durukan (2020) also stated that although teacher candidates are aware of Web 2.0 tools, their ability to integrate them into educational environments is low. Soomro, Zai, and Jafri (2015) also reported that most faculty members in Pakistani higher education lack the skills and awareness to use Web 2.0 technologies in their teaching practices effectively. In their experimental study, Keçeci, Yıldız, Yıldırım, Alan, and Zengin (2023) also reported that there was a significant difference in the knowledge and competency levels of Web 2.0 tools between instructors who received training and those who did not, favoring the teachers who received training. Can and Kerkez (2023) also reported that teachers who took the Web 2.0 tools course in the educational technology course had significantly higher Web 2.0 tool proficiency levels. Koehler and Mishra (2009) proposed a model called "Technological pedagogical content knowledge (TPACK)" for the use of Web 2.0 tools for educational purposes. In the model, the competencies that teachers must have to use Web 2.0 tools effectively in educational environments are as follows; "Web 2.0 content knowledge, 'Web 2.0 pedagogical knowledge', 'pedagogical content knowledge' and 'Web 2.0 pedagogical content knowledge'. They stated that this model exhibits a

structure within a complex and intertwined relationship. Therefore, it can be said that teachers' awareness of Web 2.0 tools and their ability to use the tools in harmony with course content is an important variable for the use of Web 2.0 tools, and the important variable associated with this competence is the educational level of teachers. In summary, it can be said that the results of the research are compatible with the findings in the literature and that the level of use of Web 2.0 tools by teachers and teacher candidates is not sufficient.

The analyses conducted to answer the second research question revealed that the average scores of Web 2.0 tool use had a significant relationship with the educational level variable and the classroom management variable, one of the sub-dimensions of the self-efficacy scale. There are several research results in the literature that reveal the relationship between education level and Web 2.0 tools and that Web 2.0 tools can positively affect classroom management (Atalmış and Şimşek, 2022; Lemke, 2010; Özpınar, 2020; Thiyagu, 2000). For instance, Güneş and Buluç (2018) claimed that there is a positive correlation between classroom management and instructors' usage of technology. Additionally, Light and Polin (2010) claimed that using Web 2.0 tools for classroom administration—like homework assignments, student tracking, progress monitoring, and reminders—will improve classroom management. Similarly, Aldır (2014) and Arabacı and Smart (2021) said that by encouraging student participation, the usage of Web 2.0 tools lowers disciplinary issues. Therefore, it may be concluded that some benefits of Web 2.0 tools will help teachers in their classroom management practices.

In this context, it was carried out to answer the third question of the research and in line with the data obtained from the second question. As a result of the analysis, when the classroom management variable, one of the self-efficacy sub-dimensions that is related to the average scores of Web 2.0 tool use, is controlled, it is concluded that the education level and school level do not have a significant effect on the average scores of Web 2.0 usage competence, but the classroom management variable has a significant effect. The study also found that instructors' usage of Web 2.0 tools is not influenced by their educational level, which is significant information to know if the variable of classroom management has an impact in this regard. Regardless of educational background, it can be said that the classroom management skill variable may affect the amount of Web 2.0 tool usage in this context. Some studies conducted in the literature have revealed the effects of Web 2.0 tool usage on classroom management (Arabacı and Akıllı, 2021; Fadini and Fınardı 2015). For example, Light and Polin (2010) explained that by giving teachers a platform to upload and update resources, monitor student progress, and interact with students, Web 2.0 tools can help with classroom management. These resources facilitate the management of classroom activities and supplies by teachers as well as the access and monitoring of assignments by students. Web 2.0 tools can also improve communication between educators and parents, fostering a stronger sense of community inside the school and promoting learning. Thiyagu (2000) also stated that Web 2.0 tools can potentially be used in classroom management to enhance teaching and learning experiences. Additionally, according to Özpınar (2020), using Web 2.0 applications in the classroom—like Kahoot, Powtoon, Edmodo, and Beyaz Pano—can boost student engagement and participation in class activities. To spice up the lesson, encourage student participation, and improve student-teacher communication, these resources are listed. To support student learning and alleviate the teacher's mind, many methods of assessment are also given. Lemke (2010) stated that teachers may need to modify their classroom management practices while implementing Web 2.0 tools in the classroom to successfully integrate technology and maintain a productive learning environment. Additionally, according to Alhassan (2017), the use of Web 2.0 tools in the classroom could have an impact on classroom management. Using multimedia-sharing websites, like YouTube, can boost student involvement and participation, which is one method to improve classroom management. Setting clear guidelines for how

teachers and students use social media outside of the classroom can also help with effective classroom management. Because of this, it is possible to conclude, based on the research findings, that the beneficial impact of using Web 2.0 tools on classroom management is tied to teachers' usage of these tools in the classroom rather than their educational background. Consequently, it can be concluded that teachers must be familiar with Web 2.0 tools and use them in the classroom in accordance with the course content for the tools to have an impact on classroom management, even though postgraduate education and in-service training can be recommended to increase the use of Web 2.0 tools. Teachers might be encouraged to pursue postgraduate education to increase their use of Web 2.0 tools, as per the research's conclusions based on the usage of these tools by educators with postgraduate degrees. On the other hand, in-service training can be used to offer instruction on Web 2.0 technologies. Information about how Web 2.0 tools can be used in extracurricular and curricular activities can be provided in the in-service training that will take place in this setting. Additionally, teacher candidates can receive training via creating course materials for Web 2.0 tool use in undergraduate educational technology courses, which can be more effective than in-service training. Web 2.0 resources can be included in curricula as course materials, and by providing examples of use, teachers can become more knowledgeable.

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