Examining the Problems and Expectations during The Pandemic Process According to Technology Integration Levels of Teachers and Technology Leadership Self-Efficacy of School Administrators[1]

Pandemi Sürecinde Yaşanan Sorunların ve Beklentilerin Öğretmenlerin Teknoloji Entegrasyon Düzeylerine ve Okul Yöneticilerinin Teknoloji Liderliği Öz Yeterliklerine Göre İncelenmesi

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Abstract

The aim of this study is to reveal whether the problems and expectations experienced by the education system stakeholders during the pandemic process differ according to the technology integration levels of the teachers and the technology leadership self-efficacy perception levels of the school administrators. The general survey model was used to conduct research. "Indicators of Technology Integration Scale" was used to determine the technology integration indicators of teachers, and the "Technological Leadership Self-Efficacy Scale for School Administrators" was used to determine the technology leadership self-efficacy of school administrators. In addition, the Distance Education Questionnaire was used to investigate the problems experienced by teachers and school administrators during the pandemic, the changes they expect in terms of educational practices after the pandemic, and the measures that can be taken in possible situations. This study was carried out with a total of 489 people, including 369 teachers and 120 school administrators. Data management and analysis were performed using SPSS statistical program. The results of this investigation show that teachers find themselves at a sufficient level in terms of technology integration and school administrators in terms of technology leadership self-efficacy. Both teachers with high technology integration level and school administrators with high technology leadership self-efficacy perceptions stated that they experienced problems such as lack of experience in developing e-learning content during the pandemic process, the targeted acquisitions are not suitable for online environments, and the inability to provide education according to the individual interests and abilities of students in online distance education. They stated that they expect students to increase their motivation towards school and learning with the return to face-to-face education after the pandemic.

***Keywords:** Teacher, School administrator, Pandemic, Technology Integration, Technological Leadership.*

Öz

Bu çalışmanın amacı eğitim sistemi paydaşlarının pandemi sürecinde yaşadığı sorunların ve beklentilerin öğretmenlerin teknoloji entegrasyon düzeylerine ve okul yöneticilerinin teknoloji liderliği öz yeterlik algı düzeylerine göre farklılaşıp farklılaşmadığını ortaya koymaktır. Çalışmada, nicel araştırma yöntemlerinden genel tarama modeli kullanılmıştır. Öğretmenlerin teknoloji entegrasyon göstergelerini belirlemek için "Öğretmenlerin Teknoloji Entegrasyonu Göstergeleri (TEG) Ölçeği", okul yöneticilerinin teknoloji liderliği öz-yeterliğini belirlemek için "Eğitim Yöneticileri Teknoloji Liderliği Öz Yeterlik Ölçeği" kullanılmıştır. Ayrıca öğretmen ve okul yöneticilerinin pandemi sürecinde yaşadığı sorunlar, pandemi sonrasında eğitim uygulamaları açısından bekledikleri değişiklikler ve yaşanabilecek olası durumlarda alınabilecek önlemlerin belirlenmesi için Uzaktan Eğitim Anketi kullanılmıştır. Bu çalışma 2020-2021 eğitim ve öğretim yılında Türkiye'nin doğusunda yer alan bir ilde görev yapan 369 öğretmen ve 120 okul yöneticisi olmak üzere toplam 489 kişi ile gerçekleştirilmiştir. Çalışmada verilerin analizinde SPSS istatistik programı kullanılmıştır. Araştırma sonuçlarına göre öğretmenler, teknoloji entegrasyonu okul yöneticileri ise teknoloji liderliği öz yeterliği bakımından kendilerini yeterli düzeyde bulmaktadır. Hem teknoloji entegrasyon düzeyleri yüksek olan öğretmenler hem de teknoloji liderliği öz yeterlik algıları yüksek olan okul yöneticileri pandemi sürecinde e-öğrenme içeriği geliştirmede deneyim yetersizliği, hedeflenen kazanımların çevrimiçi ortamlara uygun olmaması, çevrimiçi uzaktan eğitimde öğrencilerin bireysel ilgi ve yeteneklerine göre eğitim verilememesi gibi sorunlar yaşadıklarını ve pandemi sonrasında yüz yüze eğitime geri dönülmesiyle öğrencilerin okula ve öğrenmeye karşı motivasyonlarının artacağını beklediklerini belirtmişlerdir.

***Anahtar Kelimeler:** Öğretmen, Okul Yöneticisi, Pandemi, Teknoloji Entegrasyonu, Teknoloji Liderliği*

Introduction

In today's society, it is observed that there is a change in all the dynamics of our social and economic life (Genç & Eryaman, 2017). It can be said that one of the most important building blocks of this change is the technologies that enter all areas of our lives very intensely and rapidly in the 21st century. Internet, smart phones, hardware and software that we use all the time are some of these technologies (Orgaz, et al., 2018). The correct use of technology, which changes rapidly and affects our lives directly or indirectly, and its placement at all level of society is very important for the country's interests and efficiency (Dinçer, 2003). For this reason, educational institutions have important duties at the point of raising technology-literate self-actualized individuals (Güneş & Buluç, 2017). Because, according to Güneş (2007), the progress of a society, increase in living standards, being seen as a developed country and taking its place in the changing world can only be achieved through education. In addition, the use of technology as complementary or supportive in the understanding of modern education has been accepted as an important trend (Ertmer et al., 2012). This situation leads to an increase in the interest and need for the use of technology in education in order to increase the quality in educational environments and to implement teaching activities more easily.

One of the reasons that increase the interest and need for the use of technology is the positive or negative events experienced by societies. This situation affects educational environments and practices. One of them, the virus known as Covid-19, has spread rapidly all over the world and the World Health Organization (WHO) has reported this epidemic disease as a global pandemic (WHO, 2020). With the spread of the epidemic, many restrictions have been imposed on the activities of societies in daily life. It has been stated that people have to stay at home for a while, with restrictions in areas such as travel, health, economy and education. Subsequently, the lack of physical and financial opportunities caused technology to take place in more educational activities (Alcoforado, 2020; Urdan and Weggen, 2000). In many countries around the world, it has been seen that online education applications have been passed instead of face-to-face education in order to reduce the negative impact of the pandemic on education. With this transition, the importance of technology integration concept and applications in education has increased.

It has been stated in studies that teachers and administrators have great responsibilities in the use of technology in educational practices (Uluysal et al., 2014). First of all, it was stated that teachers should be willing to use these technologies in learning environments, and then it was suggested that they should improve themselves, be open to innovations and follow current technologies (Yılmaz, 2007). In other words, it was emphasized that teachers should combine current developments and pedagogy for technology integration, use them in their lessons and try to reveal the desired behaviors (Şahin, 2011). Günüç (2017) emphasizes the role of the teacher, who determines the criteria of student characteristics and learning goals in technology integration, and then has the responsibilities of choosing technology and method, planning and evaluation according to these criteria. Because the teacher's selection of the appropriate technology is very important for the integration process. With the selection of the appropriate technology, it should be transferred to the school and the necessary support should be provided for integration. The task of providing this support rests with school administrators, who are seen as technology leaders. School administrators are expected to support teachers in the integration process, provide opportunities, actively participate in the process and encourage the process by facilitating it (Ünlüer, 2010). Hacıfazlıoğlu, Karadeniz, and Dalgıç (2011) state that school administrators should feel competent in using the skills for technology leadership, but in this way, the motivation for technology integration in schools will increase.

School administrators who have a leadership role in using technology and teachers who have important responsibilities in raising technology-literate individuals have increased their duties and responsibilities with the transition to emergency distance education during the pandemic process. Some of the problems experienced by teachers and school administrators within the scope of technology integration (lack of confidence, competence, leadership, negative thoughts, closeness to innovations, etc.) (Çakıroğlu, 2013) and the insufficient use of technology in lessons (Akbulut, et al., 2011) are included in the literature. However, new problems have been added to these problems due to online course activities during the pandemic process. In this process, the experiences, ideas and approaches of teachers and school administrators who work at the practitioner and the most important point of the work are extremely important (Onbaşılı, 2018; Topper, 2004). Within the framework of these problems, the importance of this study are that it explores detecting the increasing deficiencies in the use of technology integration during the pandemic process, taking precautions against possible similar negative situations and pioneering future studies.

There are two primary aims of this study: 1. To examine the level of technology integration of teachers and the level of technology leadership self-efficacy perception of school administrators, 2. To reveal whether the problems they experienced during the pandemic process, the changes they expected after the pandemic and the measures to be taken differ according to these level. In this context, the sub-research questions of the research are as follows;

• What is the level of technology integration of *teachers*?

• Do the problems experienced during the pandemic process differ according to level of technology integration of *teachers*?

• Do the expected changes in education after the pandemic differ according to level of technology integration of *teachers*?

• Do their views on the measures to be taken regarding a possible pandemic process in the future differ according to level of technology integration of *teachers*?

• What is the level of technology leadership self-efficacy perception of *school administrators*?

• Do the problems experienced during the pandemic process differ according to level of the technology leadership self-efficacy perception of *school administrators*?

• Do the changes they expect to experience in education after the pandemic differ according to level of the technology leadership self-efficacy perception of *school administrators*?

• Do their views on the precautions to be taken regarding a possible pandemic process in the future differ according to level of the technology leadership self-efficacy perception of *school administrators*?

1. Method

This research examines the level of technology integration of teachers in a city in the east of Turkey, the level of technology leadership self-efficacy perception of school administrators, and reveals whether the problems they experienced during the pandemic process, the changes they expected after the pandemic and the measures to be taken differ according to these level. The survey model was used in the research. The main aim of the survey model is to cover the surveys on the sample group taken from the determined population (Büyüköztürk, et al., 2009).

1.1. Participations

The research universe consists of all administrators and teachers working in primary and secondary education institutions affiliated to the Ministry of National Education in a city located in the east of Turkey in the 2020-2021 academic year. The research sample group was determined by simple random sampling method among the administrators and teachers working in primary and secondary education institutions affiliated to the Ministry of National Education in a province located in the east of Turkey in the 2020-2021 academic year. The simple random sampling method is a method in which selected units are sampled, giving each sampling unit an equal probability of being selected (Gurbetoğlu, 2018). Before the implementation, necessary permissions were obtained from the Provincial Directorate of National Education. Demographic structures of teachers and school administrators are given in Table 1.

Table 1. Demographic Structures of The Participants

	Teacher		School Administrators	
Gender	*f*	*%*	*f*	*%*
Female	149	40.40	4	3.33
Male	220	59.60	116	96.67

1.2. Data Collection Tools

In this study, four instruments were used to collect data. The first of these tools is the personal information form to be used to determine the general profile of the study group and to collect demographic data. Ethical approval was obtained from the Ethics Committee of the Faculty of Education of …. University with the date and number of 97132852/302.14.01 before starting the study.

1.2.1. Indicators of Technology Integration (ITI) Scale

Data were collected using "Indicators of Technology Integration Scale" developed by Çakıroğlu et al. (2015) for determine the technology integration indicators of teachers. Participants were asked to respond using a 5-point Likert scale ranging from strongly disagree and strongly agree. According to the results of the reliability analysis, the Cronbach Alpha reliability coefficient value of the items in the scale was calculated as .931. The scale consists of 28 items and 5 sub-dimensions. The Cronbach-Alpha coefficients of the reliability results of scale were calculated as .841, .831, .873, .860 and .841 for the sub-dimensions (technology literacy, teaching with technology, professional development, ethics and policies and organization and management), respectively. The Cronbach Alpha reliability coefficient of the scale in this study was found to be .979.

1.2.2. Technological Leadership Self-Efficacy Scale for School Administrators

Data were collected using "Technological Leadership Self-Efficacy Scale for School Administrators" developed by Hacıfazlıoğlu et al. (2011) for determine the technology leadership self-efficacy perceptions of school administrators. Participants were asked to respond using a 5-point Likert scale ranging from strongly disagree and strongly agree. According to the results of the reliability analysis, the Cronbach Alpha reliability coefficient value of the items in the scale was calculated as .97. The scale consists of 26 items and 5 sub-dimensions. The Cronbach-Alpha coefficients of the reliability results of scale were calculated as.83 ,.91, .89, .92 and .91 for the sub-dimensions (visionary leadership, digital age learning culture, excellence in professional practice, systematic improvement and digital citizenship), respectively. The Cronbach Alpha reliability coefficient of the scale in this study was calculated as .988.

1.2.3. Distance Education Questionnaire

For the purpose of investigating the opinions of teachers and school administrators during the pandemic process, the "Distance Education Questionnaire" prepared by Korkmaz & Toraman (2020) was used. The questionnaire, which is in the double likert type, consists of 50 items and 3 sub-dimensions. Since the questionnaire does not require statistical validity and reliability as a data collection tool, expert opinions were taken to ensure validity and reliability. In line with the opinions received, it was determined that the measurement tools used in the study provided reliability. The applied data collection tools were carried out online due to the Covid-19 pandemic process.

1.3. Data Analysis

The data obtained during the study were firstly recorded by the researcher in a regular manner through forms suitable for the questionnaire items to be prepared in the SPSS 23 package program, and then interpretations were made using appropriate analysis methods for the available data. Since the data did not showed normal distribution ($p < .05$) as a result of the Kolmogorov-Smirnov test ($p=.00$), non-parametric tests were used. Frequency on the data was calculated by arithmetic mean, percentage and Mann-Whitney U tests.

2. Findings

2.1. Technology Integration Indicators for Teachers

The descriptive analysis results of findings on technology integration indicators of teachers are shown in Table 2.

Table 2. Descriptive Analysis Results of Technology Integration Indicators of Teachers and Sub-Dimensions

Sub Factors	f	$\bar{X}$	Ss
Technology Literacy	369	4.23	.30
Teaching with Technology	369	4.17	.31
Professional Development	369	4.19	.27
Ethics and Policy	369	4.20	.28
Organization and Management	369	4.26	.28
General	369	4.21	.14

As a result of the descriptive analysis, it was determined that the teachers gave answers (Min= 1, Max= 5, X̄= 4.21, Sd= .14) to the ITI scale that corresponded to the range of "strongly agree". According to the results obtained, teachers' technology integration indicators are at a high level.

2.2. Differentiation of Problems Experienced by Teachers During the Pandemic Process According to Level of Technology Integration

The results of the analysis according to the changes in technology integration of the problems experienced by the teachers during the pandemic process are presented in Table 3.

Table 3. Mann-Whitney U Test Results on Whether the Problems Experienced by Teachers Have Changed According to Level of Technology Integration During the Pandemic Process

Problems	Group	N	Mean Rank	Sum of Ranks	U	Z	P
4. Educators had a lack of experience in preparing e-learning content.	Yes	308	191.16	58877	7497	-2.493	.013
	No	61	153.90	9.388			
8. Educators were not experienced in using information and communication technologies (ICT).	Yes	270	195.52	52790	10525	-3.129	.002
	No	99	156.31	15475			
15. Not all the learning outcomes determined for students can be gained through online learning environment	Yes	338	189.08	63908	3861	-2.425	.015
	No	31	140.55	4357			
17. In online learning, it is difficult to teach according to the individual interests and abilities of the students	Yes	327	190.33	62236.5	5125.5	-2.676	.007
	No	42	143.54	6028.5			
23. Educators didn't have a suitable environment at home for online teaching	Yes	244	193.47	47206.5	13183.5	-2.131	.033
	No	125	168.47	21058.5			

When Table 3 is examined, there was a statistically significant difference in terms of level of technology integration in item 4, item 8, item 15, item 17 and item 23, which are among the problems experienced by teachers during the pandemic process. There was no significant difference in the level of technology integration of the teachers regarding the remaining items from the problems they experienced during the pandemic process. In other words, problems such as teachers' lack of experience in preparing e-learning content, their competency in using ICT, not providing all the determined gains in online environments, not providing education according to the interests of students in online environments, and teachers' home environments not being sufficient to teach online gave significant results according to level of technology integration.

2.3. The Differentiation Status of the Changes that Teachers Expect to Experience in Education After the Pandemic by Level of Technology Integration

The changes that teachers expect to experience in the field of education after the pandemic, according to level of their technology integration, are presented in Table 4.

Table 4. Mann-Whitney U Test Results of Differentiation of the Changes that Teachers Expect to Experience in Education After the Pandemic by Level of Technology Integration

Expected Changes	Group	N	Mean Rank	Sum of Ranks	U	Z	P
1.Educators' competencies will be reshaped	Yes	290	191.45	55520	9585	-2.225	.026
	No	79	161.33	12745			
2. The need for online learning environments will increase	Yes	275	193.93	53329.5	10470.5	-2.750	.006
	No	94	158.89	14935.5			
7. Education will undergo a paradigm shift	Yes	324	190.87	61842	5388	-2.837	.005
	No	45	142.73	6423			
9. Education faculties will integrate more courses about online learning into their curricula	Yes	333	191.13	63646			

	No	36	128.31	4619	3953	-3.357	.001
11. Upon returning to schools/universities, students' motivation towards learning will increase.	Yes	326	191.21	62342.5	4976.5	-3.092	.002
	No	43	137.73	5922.5			
15. Online education will provide equal opportunities for all students	Yes	267	191.94	51247	11765	17018	.043
	No	102	166.84	17018			

It can be seen from the data in Table 4 that, there was a statistically significant difference in terms of level of technology integration in item 1, item 2, item 7, item 9, item 11 and item 15, which are among the changes that teachers expect to experience in the field of education after the pandemic. There was no significant difference in other items according to level of technology integration. In other words, teachers with high level of technology integration expect changes such as the re-questioning of teacher competencies after Covid-19, a greater need for online education instead of formal education, changing perceptions in education, adding courses related to online applications to their education curriculum, increasing student motivation in the transition to face-to-face education and providing equality of opportunity in learning with online applications.

2.4. The Difference of Opinions of Teachers on Measures to be Taken in Education Regarding a Possible Pandemic Process in the Future, According to Level of Technology Integration

Table 5 provides the analysis results of the differences in the opinions of the teachers about the measures that can be taken in the field of education in a possible pandemic process in the future, according to their level of technology integration.

Table 5. Mann-Whitney U Test Results Regarding the Differences of Opinions of Teachers on the Precautions to be Taken in Education Regarding a Possible Pandemic Process in the Future According to Level of Technology Integration

Measures	Group	N	Mean Rank	Sum of Ranks	U	Z	P
1. The requirements such as network capacity, internet speed, information technology should be enhanced	Yes	364	185.59	67553.5	696.5	-.901	.367
	No	5	142.30	711.5			
2. Educators' competencies related to online learning environment need to be supported more	Yes	349	186.62	65129.5	2925.5	-1.217	.224
	No	20	156.78	3135.5			
3. All educators should undergo training to use online learning management systems	Yes	355	184.75	65588	2398	-.222	.824
	No	14	191.21	2677			
4. Every student's access to the internet or other necessary equipment should be guaranteed	Yes	341	187.31	63874	3985	-1.454	.146
	No	28	156.82	4391			
5. Special trainings about getting ready for another potential outbreak in the future should be organized for both students and educators	Yes	355	184.56	65520	2330	-.396	.692
	No	14	196.07	2745			
6. Educator, student and parent cooperation needs to be dynamized	Yes	356	187.08	66598.5	1574.5	-1.958	.050
	No	13	128.12	1665.5			
	Yes	351	187.33	65754.5			

7. More emphasis should be placed on teaching real-life problem-solving skills	No	18	139.47	2510.5	2339.5	-1.857	.063
8. Curricula should be revised and made more effective	Yes	349	186.28	65010	3045	-.959	.337
	No	20	162.75	3255			
9. Topics related to self-care, health, hygiene etc. should be integrated more in the curriculum content	Yes	351	186.75	65549.5	2544.5	-1,392	.164
	No	18	150.86	2715.5			

As shown in Table 5, there was no significant difference in the level of technology integration of teachers in all items regarding the precautions that can be taken in the field of education during a possible pandemic.

2.5. Indicators of Technology Leadership Self-Efficacy Perceptions of School Administrators

The descriptive analysis results of findings on technology leadership self-efficacy perceptions scale indicators for school administrators are given in Table 6.

Table 6. Descriptive Analysis Results of Technology Leadership Efficacy Perceptions Scale Indicators for School Administrators and Sub-Dimensions

Sub Factors	F	X̄	Ss
Visionary Leadership	120	3.86	.27
Digital Age Learning Culture	120	3.84	.23
Excellence in Professional Practice	120	3.81	.27
Systemic Improvement	120	3.81	.22
Digital Citizenship	120	3.76	.26
General	120	3.81	.11

As a result of the descriptive analysis, the average of the answers given by the school administrators to the scale to determine their technology leadership self-efficacy perceptions was found to be 3.81 and the standard deviation was 0.11. According to this result, while school administrators gave answers corresponding to the "sufficient" range on the scale (Min= .00, Max= 5, X= 3.81, Sd= .11), they preferred the "Visionary Leadership" sub-factor the most (Min=0, Max). = 5, X= 3.86, Ss= .27).

2.6. Differentiation Status of the Problems Experienced by School Administrators during the Pandemic Process According to Level of Technology Self-Efficacy Perception

During the pandemic process, it has been observed that school administrators as well as teachers have experienced many problems. Table 7 shows the analysis of the problems experienced by school administrators regarding whether there is a difference according to their level of technology self-efficacy perception.

Table 7. Mann-Whitney U Test Results on Whether the Problems Experienced by School Administrators Change According to Level of Technology Self-Efficacy Perception During the Pandemic Process

Problems	Group	N	Mean Rank	Sum of Ranks	U	Z	P
4. Educators had a lack of experience in preparing e-learning content.	Yes	113	62.42	7053	179	-2.425	.015
	No	7	29.57	207			

6. Students had internet connection problems	Yes	120	60.5	7260	.00	.00	.00
	No	0	.00	.00			
9. Online learning management systems were not user-friendly	Yes	67	66.84	4478	1351	-2.244	.025
	No	53	52.49	2782			
11. Reliable assessment could not be made in the online education environment	Yes	106	63.23	6702.5	452.5	-2.367	.018
	No	14	39.82	557.5			
13. Online education is not efficient in providing skills teaching (such as listening or speaking in language classes, drawing in visual arts lesson, etc.)	Yes	112	62.83	7037	187	-2.746	.006
	No	8	27.88	223			
15. Not all the learning outcomes determined for students can be gained through online learning environment	Yes	109	62.79	6970	245	-2.536	.011
	No	11	32.22	290			
17. In online learning, it is difficult to teach according to the individual interests and abilities of the students	Yes	107	63.43	6787	382	-2.648	.008
	No	13	36.38	473			
19. Student motivation in online education is lower compared to face-to-face classes	Yes	109	65.53	7143	51	-4.989	.000
	No	11	10.64	117			
20. The school/university administrators showed positive attitude and behaviors towards educators who teach online during the online education period	Yes	90	64.27	5784	1011	-2.055	.040
	No	30	49.20	1476			
24. The fact that online lectures are archived created extra stress on educators.	Yes	40	77.28	3091	929	-3.736	.000
	No	80	52.11	4169			

*p<0.05   ** *Only the items with significant differences were reported.*

From the Table 7 we can see that, there was a statistically significant difference in terms of level of technology self-efficacy perception in item 4, item 6, item 9, item 11, item 13, item 15, item 17, item 19, item 20 and item 24, which are among the problems experienced by school administrators during the pandemic process. There was no significant difference in the level of technology self-efficacy perception of school administrators regarding the remaining items from the problems they experienced during the pandemic process.

2.7. The Difference Between the Level of Technology Self-Efficacy Perceptions of the Changes that School Administrators Expect to Experience in Education After the Pandemic

The analyzes according to the differentiation status of the changes that school administrators expect to experience in education after the pandemic, according to their level of technology self-efficacy perception, are shown in Table 8.

Table 8. Mann-Whitney U Test Results of the Changes that School Administrators Expected to Experience in Education After the Pandemic According to Level of Technology Self-Efficacy Perception

Expected Changes	Group	N	Mean Rank	Sum of Ranks	U	Z	P
5. Educators' ability to provide online learning will improve	Yes	115	62.06	7137	108	-2.358	.018
	No	5	24.60	123			
10. There will be no need for formal/face-to-face education.	Yes	6	25.14	151	130	-2.553	.011
	No	114	62.36	7109			
11. Upon returning to schools/universities, students' motivation towards learning will increase.	Yes	107	62.96	6736.5	432.5	-2.221	.026
	No	13	40.27	523.5			
13. Each school will have to develop and implement its own, individual curriculum.	Yes	101	57.15	5772	621	-2.435	.015
	No	19	78.32	1488			

*p < 0.05 ** *Only the items with significant differences were reported.*

As can be seen from the Table 8, there was a statistically significant difference in terms of level of technology self-efficacy perception in item 5, item 10, item 11 and item 13, which are among the changes that school administrators expect to experience in education after the pandemic. There was no significant difference in terms of the level of technology self-efficacy perception of school administrators in the remaining items from the changes they expected to experience in education after the pandemic.

2.8. The Differences in the Opinions of School Administrators on the Measures to be Taken Regarding a Possible Pandemic Process in the Future According to the Level of Perception of Technology Self-Efficacy

Table 9 presents the analysis of the results of the differentiation of views of school administrators on the measures that can be taken in the field of education regarding a possible pandemic process in the future, according to the level of technology self-efficacy perception.

Table 9. Mann-Whitney U Test Results Regarding the Differences of School Administrators' Opinions on Measures to be Taken in Education Regarding a Possible Pandemic Process in the Future, According to Level of Technology Self-Efficacy Perception

Measures	Group	N	Mean Rank	Sum of Ranks	U	Z	P
1. The requirements such as network capacity, internet speed, information technology should be enhanced	Yes	120	60.50	72.60	.00	.00	.00
	No	0	.00	.00			
8. Curricula should be revised and made more effective	Yes	115	61.83	7110	135	-2.003	.045
	No	5	30	150			

*p < 0.05 ** *Only the items with significant differences were reported.*

As shown in Table 9, there was a statistically significant difference in terms of level of technology self-efficacy perception in item 1 and item 8, among the opinions of school administrators on the measures that can be taken in the field of education during a possible pandemic. There was no significant difference in the remaining items of the measures that can be taken in the field of education during a possible pandemic process, according to the level of technology self-efficacy perception of school administrators.

Conclusion, Discussion and Recommendations

In this study, first of all, the technology integration level of the teachers and the level of technology leadership self-efficacy perception of the school administrators were determined, and then the problems experienced by the stakeholders during the pandemic process, the changes they expected after the pandemic and whether the precautions to be taken differed according to these level were examined. The results of this investigation show that the level of technology integration of the teachers were high. There are studies supporting this result in the literature (Kara, 2011; Yurdakul, 2011; Haznedar, 2012; Heerwegh, et al., 2016; Ozan & Taşgın, 2017; Alp, 2019; Gökçearslan, et al., 2019). It is important for teachers to have a high level of technology integration in order to enable them to spend their lessons more efficiently and to feel more competent. According to the findings obtained from the research, school administrators generally see themselves as sufficient in technology leadership. There are studies in the literature that reach similar results (Anderson & Dexter, 2005; Ergişi, 2005; Yu & Durrington, 2006; Eren-Şişman, 2010; Banoğlu, 2011). The finding that administrators have high technology leadership perceptions is very valuable in terms of creating a technology vision, supporting digital learning activities at school, providing technological infrastructure and ensuring continuity, and creating innovative and sustainable activities (Chang & Wu, 2008).

Findings on the expectations of teachers and administrators obtained from the research, similar to the study of Korkmaz and Toraman (2020), are that permanent changes should be experienced in the field of education. Teachers with high technology integration levels stated that after the pandemic, teacher competencies will be questioned again, the need for online education environments will increase, the paradigm (perception styles) in education will change, and they expect more courses on online learning management systems to be added to the curricula of education faculties. In addition, educators stated that with the return to face-to-face education, students' motivation towards school and learning will increase and online distance education will provide equality of opportunity in learning. School administrators with high technology leadership self-efficacy perceptions stated that they expect teachers to increase their online distance education competence, increase the motivation of students towards school and learning with the return to face-to-face education, and that each school has to update its own education program. In line with these expectations, Bozkurt (2020) stated that the coronavirus pandemic has affected the field of education and that fundamental reforms and strategic planning are needed to ensure continuity in education.

Findings from the research on measures to be taken in education against possible new epidemics Crawford et al. (2020), Huang et al. (2020), Liu et al. (2020) in line with research conducted by according to educators, network capacities should be increased, teachers' online learning competencies should be increased, learning management systems should be supported, each student should be provided with internet access, students' problem-solving skills should be improved, precautions should be taken for possible epidemics in the future, and cooperation with parents should be developed. According to the results of the questionnaire applied to the school administrators, it was concluded that the distance education process was passed very quickly, the teachers were not ready for this process, the necessary infrastructure was not available in the schools, the majority of the students had internet problems, the teachers did not teach and interact sufficiently in online education compared to face-to-face education. It has been seen that the results are compatible with the results of the research conducted by Tho and Yeung (2016), Tseng, Cheng and Yeh (2019).

The findings of this study have a number of important implications for future practice. The prominent finding of the study is that both teachers with high level of technology integration and school administrators with high technology leadership self-efficacy perceptions lack experience in developing e-learning content during the pandemic process, the targeted acquisitions are not suitable for online environments, and the education according to the individual interests and abilities of the students in online distance education. They stated that they had problems such as not being able to give. It is thought that these problems arise especially from the fact that teachers and administrators are accustomed to traditional environments. El Turk (2016) and Özcan (2019) argued that administrators and teachers who are accustomed to traditional environments experience problems in online learning environments due to institutional policies, cultural, social, pedagogical and technical obstacles. Meeker (2017), on the other hand, argued that these problems affect teachers' commitment to the online learning environment. Teachers need to receive training to adapt to the online environment and increase their commitment (Betts & Heaston, 2014). In order to minimize the problems experienced by teachers and school administrators during the pandemic process, practice-based courses that will improve technology integration skills can be organized in schools under the guidance of information technology teachers. In these courses, teachers can be given training on the design of online learning environments and on developing the content to be used in these environments. In addition to technological skills, different needs should also be taken into account in the training given to teachers for online learning environments. However, it is foreseen that in this way it will cope with these problems.

Teachers and administrators play a key role in overcoming the problems in online education. Therefore, it is very important for teachers to develop their knowledge and skills in online education. School administrators, on the other hand, are required to provide all kinds of support to students and teachers by using their personal and business resources.

Considering the key role of teachers and administrators, the study should be repeated by comparing them with other study groups that have differences in terms of demographic characteristics, level of technology integration and physical conditions. Further work needs to be done to support the success of teachers whose responsibilities and workforce increase in online learning environments. In order to solve the problems stated by teachers and school administrators, the Ministry of National Education can carry out studies on minimizing the negative effects that can be experienced by increasing the level of technology integration with in-service trainings. School administrators, who are accepted as leaders in schools, can be given seminars to improve psychological factors in a positive way and to remove the related technology integration barriers. In order to provide more effective and permanent solutions, it is recommended to establish effective communication with the Computer and Instructional Technologies Education Departments of education faculties, as well as in-service training and seminars.

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