DETERMINING TEACHERS' OPINIONS ON TECHNOLOGY LEADERSHIP ROLES OF SCHOOL HEADS DURING THE COVID-19 PANDEMIC PROCESS

Görkem KARAOĞLAN
KKTC MEB, North Cyprs,
gork.gs.96@gmail.com
Orcid no: 0000 0003 0897 097X

Figen YAMAN LESINGER
Cyprus Health and Social Science University, North Cyprus, figen.yaman@kstu.edu.tr
Orcid no: 0000-0002-9556-4305

ABSTRACT
The purpose of this research; to determine the opinions of teachers about the proficiency levels of technology leadership behaviors of school administrators during the Covid-19 pandemic process. This research was conducted with the descriptive survey model, one of the quantitative research models. The sample of the research consists of 500 primary school teachers working in schools affiliated to the Turkish Republic of Northern Cyprus Ministry of Education, Primary Education Department, in the 2021-2022 academic year. Research data were analyzed with SPSS 25.0 (Statistical Package for Social Science) program. According to the teachers' opinions, it was concluded that primary school administrators exhibited their technology leadership roles adequately in the dimension of human-centeredness, communication and cooperation and support, and partially in the dimension of vision. According to the variables of gender, age and professional seniority; There was no significant difference between teachers' views on human-centeredness, vision, communication and cooperation, and support dimensions of school administrators' technology leadership roles.
Keywords: Technology leadership, school administrators, coronavirus pandemic

Introduction

Covid-19, which affects all areas of life and makes it necessary to make some changes, has made it necessary to discuss different applications in education activities (Bozkurt,2020).

WHO (2019) has prepared a series of recommended plans in order to prevent the further spread of coronavirus in countries and to prepare countries against this epidemic. According to these plans; In order to narrow the impact of the epidemic and reduce its spread, changes have been made such as partial or full-time curfews applied in all countries of the world, restriction of collective and institutional activities, quarantine and isolation practices for international flights, alternating working hours, alternative education practices (WHO, 2019).

As of March 10, the date of the first coronavirus case in the TRNC, education was temporarily suspended; The distance education system has been in a position to support the existing education system. (KKTC MEB, 2020). Distance Learning; It is an interactive and economic education model in which time and space are made independent and realized through information and communication technologies (Toker Gökçe, 2008).

With the inclusion of information technologies in the education process, school administrators are responsible for evaluating the technological infrastructure of the educational institution, creating the necessary planning for the development of this infrastructure, integrating educational technologies into the curriculum, informing teachers and students about the process (Özkan et al., 2017).

Considering that the leader determines the corporate policies and must adopt universal policies while determining these policies; It is necessary to have knowledge about the benefits of technology. At this point, the concept of "technology leadership" emerges (Sincar, 2009).

Technology leadership; It is defined as the ability to support the use of educational technology in schools and to ensure its continuity. Technology leader; In order to ensure this continuity, it exhibits behaviors such as providing a support training program to the employees, analyzing the technical infrastructure of the school according to needs, closely following the technological developments and evaluating whether the institution achieves its goals (Okeke, 2010).

Conducting education from technological environments during the pandemic process; It is an indication that the technology leadership role of school administrators is an essential need. School administrators, who have

technological equipment and assume the role of technology leadership during the pandemic process, can make their educational institutions more qualified (Öztaban, 2020).

In this direction, the aim of the research is to determine the teachers' opinions on the proficiency levels of technology leadership behaviors of school administrators during the Covid-19 pandemic process.

Aim

The purpose of this research is to determine the opinions of teachers on the proficiency levels of technology leadership behaviors of school administrators during the Covid-19 pandemic process. In line with the purpose of the research, answers to the following questions will be sought;
1. What are the technology leadership competency levels of school administrators during the pandemic process?
2. In the pandemic process, is there a significant difference between the technology leadership competency levels of school administrators and the gender variables of teachers?
3. Is there a significant difference between the technology leadership competency levels of school administrators and the age variables of teachers during the pandemic process?
4. Is there a significant difference between the technology leadership competency levels of school administrators and the variables of professional seniority of teachers during the pandemic process?

Methods

Research and Design

In this study, descriptive survey model, one of the quantitative research methods, was used. Quantitative research is a research model in which statistical results are obtained from the data obtained in line with the purpose of the research by examining a specific sample of the universe (Lowhorn, 2007). The descriptive survey model aims to explain and describe the researched subject in detail (Büyüköztürk et al., 2018).

Sample and Data Collection

Simple (random) sampling method was preferred in order to reach the number of samples. Simple (random) sample; It is a sample type that assumes that every individual in the universe has an equal probability of being selected (Baltacı, 2018). In other words; Individuals who define the universe are equally likely to form the research sample (Kabakçı Yurdakul, 2013).

The sample group of the research consists of 500 primary education teachers working in schools affiliated to TRNC Ministry of Education, Primary Education Department in the 2021-2022 education period. The demographic characteristics of the teachers participating in the research are given in Table 1.

Table 1. *Demographic Characteristics Of The Teachers Participating İn The Research*

Variables		f	%
Gender	**Female**	294	58.8
	Male	206	41.2
Age	**20-30 years**	161	32.2
	31-40 years	191	38.2
	41-50 years	131	26.2
	51 years and over	17	3.4
Professional Seniority	**0-5 years**	122	24.4
	6-10 years	141	28.2
	11-15 years	70	14.0
	16-20 years	103	20.6
	21 years and over	64	12.8
TOTAL		**500**	**100**

The scale used to reach the data within the scope of the research consists of two parts. "Personal Information Form" prepared by the researcher in the first part; In the second part, the "Technology Leadership Roles Scale of Primary School Administrators" developed by Sincar, M. (2009) was used.

Personal Information Form
The "Personal Information Form" used within the scope of the research was prepared by the researcher. In the content of the personal information form, there are questions about teachers' gender, age and professional seniority.

Technology Leadership Roles Scale of Primary School Administrators
The "Technology Leadership Roles Scale of Primary School Administrators" developed by Sincar, M., (2009) to analyze the technological leadership behaviors exhibited by school administrators was used. The scale is a 5-point Likert-type scale consisting of 29 items. Scale; It consists of four sub-dimensions: human-centeredness, vision, communication and cooperation and support. The reliability coefficient of the scale was determined by the Cronbach Alpha value and the reliability coefficient was found to be .97.

Data Analysis
The data obtained during the research process; It was analyzed with SPSS 25.0 statistical program.
Demographic characteristics of teachers obtained during the research process; Frequency and percentage calculations, which are descriptive statistics types, were used to analyze it. The data obtained from the scale used in the research (n>50), the normality distributions of the scale and its sub-dimensions were analyzed using the Kolmogorov-Smirnov test. With the Kolmogorov-Smirnov test; It was concluded that the research data were not normally distributed ($p<0.05$). In line with this result; It was decided to apply non-parametric tests and Mann-Whitney U and Kruskal Wallis H tests were used

Findings

Table 2. Descriptive Statistics of Teachers' Views on Technology Leadership Roles of School Administrators by Scale Sub-Dimensions

	Number of Items	$\bar{x}$	sd
Human Centricity	11	3.56	.602
Vision	7	3.35	.723
Communication and Cooperation	6	3.40	.681
Support	5	3.47	.667
General	29	3.44	.668

When the mean values of the scale sub-dimensions in Table 2 are examined; according to the teachers' opinions, school administrators exhibits technology leadership roles mostly in the "Human Centricity" dimension ($\bar{x}=3.56$), secondly in the "Support" dimension ($\bar{x}=3.47$), and thirdly in the "Communication and Cooperation" dimension ($\bar{x}=3.40$) , and finally, in the "Vision" dimension ($\bar{x}=3.35$). When the general average value of the data ($\bar{x}=3.44$) is examined; It is thought that school administrators exhibit their technology leadership roles during the pandemic process.

Table 3. Descriptive Statistics of Teachers' Views on the Technology Leadership Roles of School Administrators on Scale Items

Scale Items	$\bar{x}$
Items related to the "Human Centricity" sub-dimension	
1. Together with all members of the school, they determine the ethical situations regarding the use of technology at school.	3.67
2. They determine the needs of students and teachers while bringing educational technologies to the school.	3.87
3. They encourage teachers to receive training on the use of educational technologies.	3.69
4. Evaluate teachers' use of educational technologies in the learning-teaching process.	3.19
5. They support teachers to use internet services to communicate among themselves.	4.01
6. They benefit from internet services to ensure in-school communication with all members of the school.	4.24
7. Evaluate the effects of educational technologies on students' school success.	3.07
8. They ensure that all members of the school benefit equally from educational technologies in the school.	3.72

9. They solve the problems related to the use of educational technologies by ensuring the participation of all individuals in the school.	3.48
10. They seek the opinions of the students for the effective use of educational technologies at school.	2.35
11. They seek the opinions of teachers for the effective use of educational technologies at school.	3.79

Items related to the "Vision" sub-dimension

12. They have a vision regarding the effective use of educational technologies at school.	3.38
13. They share their vision of the effective use of educational technologies at school with the educational staff.	3.46
14. They have long-term technological development plans.	3.04
15. They support the views on the implementation of educational technology plans at school.	3.63
16. They follow the developments in the use of educational technologies and advocate continuous renewal.	3.30
17. They conduct research on the educational technology needs of the school.	3.22
18. They determine the appropriate educational technologies that will facilitate educational activities.	3.39

Items related to the "Communication and Cooperation" sub-dimension

19. They benefit from internet technologies in communication and cooperation with parents.	3.93
20. They benefit from internet technologies in communication and cooperation with the social environment of the school.	3.97
21. They use technology to ensure the development and innovation of the school.	3.58
22. They generate ideas on how to adapt technological developments to learning-teaching processes with all members of the school.	3.33
23. They form a technology committee to represent all the members of the school in order to implement the plans for educational technologies in the learning-teaching processes.	2.37
24. They use educational technologies to collect data on students' progress.	3.21

Items related to the "Support" sub-dimension

25. They support the organization of learning-teaching environments according to the developments in educational technologies.	3.55
26. They organize technological environments that will meet the needs of students.	3.30
27. They support the use of educational technologies that will contribute to the development of students' thinking skills on a subject.	3.48
28. They enable teachers to benefit from the opportunities brought by technology in order to enrich the learning-teaching environments.	3.58
29. In the use of educational technologies, they exhibit behaviors that will set an example for the educational and auxiliary personnel in the school.	3.42

When Table 3 is examined, "They benefit from internet services to provide in-school communication with all members of the school." item has the highest arithmetic mean value (x̄=4.24). When the arithmetic mean values are examined, the lowest value (x̄=2.35) is "They seek the opinions of the students for the effective use of educational technologies at school." appears to belong to the article.

When the arithmetic mean values of the items in the "vision" sub-dimension are examined, "They support the views on the implementation of educational technology plans at school." item has the highest arithmetic mean value (x̄=3.63). When the arithmetic mean values are examined, the lowest value (x̄=3.04) is "They have long-term technological development plans." appears to belong to the article.

When the arithmetic mean values of the items in the "Communication and Cooperation" sub-dimension are examined, "They benefit from internet technologies in communication and cooperation with the social

environment of the school." item has the highest arithmetic mean value ($\bar{x}=3.97$). When the arithmetic mean values are examined, the lowest value ($\bar{x}=2.37$) is "They form a technology committee that will represent all the members of the school so that the plans for educational technologies can be applied to the learning-teaching processes." appears to belong to the article.

When the arithmetic mean values of the items in the "Support" sub-dimension are examined, "They enable teachers to benefit from the opportunities brought by technology in order to enrich the learning-teaching environments." item has the highest arithmetic mean value ($\bar{x}=3.58$). When the arithmetic mean values are examined, the lowest value ($\bar{x}=3.30$) is "They organize technological environments that will meet the needs of the students." appears to belong to the article.

Table 4.
Mann-Whitney U Test Results Regarding the Differences in the Technology Leadership Roles of School Administrators in the Sub-Dimensions of the Scale by Gender of the Teachers during the Covid-19 Pandemic Process

	Gender	N	Average of Ranks	Sum of Ranks	U	p.
Human Centricity	F	294	259.13	76185.50	27743.500	.110
	M	206	238.18	49064.50		
	Total	500				
Vision	F	294	256.91	75530.50	28398.500	.234
	M	206	241.36	49719.50		
	Total	500				
Communication and Cooperation	F	294	253.45	74515.00	29414.000	.584
	M	206	246.29	50735.00		
	Total	500				
Support	F	294	257.73	75771.50	28157.500	.177
	M	206	240.19	49478.50		
	Total	500				

As a result of Mann-Whitney U test in Table 4; According to the gender variable, there was no statistically significant difference between teachers' opinions in all sub-dimensions of the scale ($p>0.05$).

Table 5.
Kruskal Wallis H Test Results Regarding the Differences in the Technology Leadership Roles of School Administrators in the Sub-Dimensions of the Scale by Age of the Teachers during the Covid-19 Pandemic Process

	Age	N	Average of Ranks	X²	p.
Human Centricity	20-30 years	161	244.16	2.819	.420
	31-40 years	191	248.02		
	41-50 years	131	254.99		
	51 years and over	17	303.79		
Vision	20-30 years	161	242.63	.867	.833
	31-40 years	191	253.21		
	41-50 years	131	257.13		
	51 years and over	17	243.50		
Communication and Cooperation	20-30 years	161	245.73	3.733	.292
	31-40 years	191	247.61		
	41-50 years	131	252.14		
	51 years and over	17	315.50		

Support	**20-30 years**	161	249.39	1.420	.701
	31-40 years	191	244.97		
	41-50 years	131	255.52		
	51 years and over	17	284.53		

As a result of Kruskal Wallis H test in Table 5; According to the age variable, there was no statistically significant difference between teachers' opinions in all sub-dimensions of the scale (p>0.05).

Table 6.
Kruskal Wallis H Test Results Regarding the Differences in the Technology Leadership Roles of School Administrators in the Sub-Dimensions of the Scale by Professional Seniority of the Teachers during the Covid-19 Pandemic Process

	Professional Seniority	**N**	**Average of Ranks**	**X²**	**p.**
Human Centricity	**0-5 years**	122	248.66	3.569	.467
	6-10 years	141	253.15		
	11-15 years	70	225.89		
	16-20 years	103	252.33		
	21 years and over	64	272.16		
Vision	**0-5 years**	122	231.61	4.340	.362
	6-10 years	141	266.50		
	11-15 years	70	260.72		
	16-20 years	103	245.52		
	21 years and over	64	248.09		
Communication and Cooperation	**0-5 years**	122	244.00	5.310	.257
	6-10 years	141	261.06		
	11-15 years	70	239.34		
	16-20 years	103	233.70		
	21 years and over	64	278.87		
Support	**0-5 years**	122	236.29	4.549	.337
	6-10 years	141	265.95		
	11-15 years	70	239.30		
	16-20 years	103	242.85		
	21 years and over	64	268.12		

As a result of Kruskal Wallis H test in Table 6; According to the professional seniority variable, there was no statistically significant difference between teachers' opinions in all sub-dimensions of the scale (p>0.05).

Discussion and Conclusion

Considering the changing education policies with the developing technology; School administrators or candidates to become school administrators are required to have certain technological competence. At this point, the decisive criterion is the technology leadership roles displayed. Similar results, as in this research, that school administrators exhibit their technology leadership roles in all sub-dimensions "sufficiently"; It has also been reached in the researches conducted by Baş (2012), Gerçek (2016), Çıkrık (2020), Öztaban (2020), Öztürk (2021). Unlike the results of this research, in the related literature; There are also studies conducted by Irmak (2015), Teke (2019), Deniz and Teke (2020) using the same scale, and it has been concluded that school administrators exhibit these roles at a "moderate level" within the framework of technology leadership.

When we examine the highest and lowest average values in the "Human Centricity" sub-dimension; according to the opinions of the teachers, we can be said that the technology leadership roles of school administrators during the pandemic process are at a good level in providing in-school communication with all members, but they are insufficient in taking student opinions on the effective use of technology.

When we examine the highest and lowest average values in the "Vision" sub-dimension; according to the opinions of the teachers, we can be said that during the pandemic process, school administrators supported the plans and practices to be carried out in educational activities and partially followed the developing and changing technological applications.

When we examine the highest and lowest average values in the "Communication and Cooperation" sub-dimension; according to the opinions of the teachers, we can be said that school administrators make use of the internet when communicating effectively, especially with the social environment of the school. Again, in line with the values obtained, it can be said that school administrators are insufficient in forming a technology committee that can guide teachers and students in providing technology information in in-school education activities. It is important that school administrators provide technological information support to education stakeholders. School administrators; It is in a position to coordinate the exchange of technological information within the institution. School administrators can benefit from the technological committee to be established at the school while providing information exchange. According to the results of the research; teachers think that the formation of technology committee at school is not sufficient. Elimination of this deficiency; It is important for analyzing the missing infrastructure and for the development of the institution. It is thought that the existence of a committee to consult with teachers or students regarding the lack of technological knowledge will eliminate the reservations regarding the use of technology.

When we examine the highest and lowest average values in the "Support" sub-dimension; according to the opinions of the teachers, we can be said that school administrators encourage and support teachers in the use and provision of educational technologies in the classroom environment; It can be said that school administrators are partially involved in the organization of classroom environments.

As a result of the analyzes made based on the second sub-problem of the research; There is no significant difference between the opinions of the teachers according to the gender variable for all sub-dimensions of the scale. In an other saying; The opinions of female and male teachers do not make a significant difference between the scale sub-dimensions regarding the technology leadership roles of school administrators during the pandemic process. In the studies conducted by Uysal Balaban (2012); Gençay and Balyer (2019); Deniz and Teke (2020); Öztaban (2020); Tezel (2020); Çıkrık (2020), it was concluded that gender difference does not create a difference of opinion among teachers. Unlike the result of this research, in the related literature; made by Gerçek (2016); There are also studies that have found that the gender variable creates a difference between the opinions of teachers.

As a result of the analyzes made based on the third sub-problem of the research; The opinions of teachers do not show a significant difference for all sub-dimensions of the scale according to the age variable. There is no difference of opinion among teachers with age ranges (20-30, 31-40, 41-50, 51 and above) that determine the variable, regarding the technology leadership roles of school administrators during the pandemic process. It is also seen in the same results of the research conducted by Teke (2019) and Çıkrık (2020).

As a result of the analyzes made based on the fourth sub-problem of the research; teachers' opinions do not show a significant difference for all sub-dimensions of the scale according to the variable of professional seniority. In an other saying; It is thought that the differences in professional seniority among teachers do not have an effect that will differentiate teachers' views on technology leadership of school administrators. In the studies conducted by Teke (2019); Gençay and Balyer (2019); Çıkrık (2020); Deniz and Teke (2020); Tezel (2020), it was concluded that professional seniority variable does not create a difference of opinion among teachers. Unlike the result of this research, in the related literature; made by Sincar (2009); Baş (2012); Uysal Balaban (2012); Öztaban (2020); Gerçek (2016); There are also studies that have found that the professional seniority variable creates a difference between the opinions of teachers.

As a conclusion of the research, when the general average value of the scale sub-dimensions is examined; It has been evaluated by the opinions of the teachers that the technology leadership competencies of the school administrators in the pandemic process are at a good level and that they are at a sufficient level to fulfill these roles. With this; according to the variables of gender, age and professional seniority, there was no significant difference between the teachers' opinions, in the sub-dimensions of the technology leadership roles displayed by school administrators during the pandemic process.

Recommendations

In order to adapt to the developing and changing conditions and not to stay away from these conditions, in-service trainings in the field of technology should be organized for school administrators. It is an important condition for

teachers who are school administrator candidates to have technology proficiency. Therefore; Educational policies of institutions undertaking a teacher training mission should be regulated by including technology leadership issues. It is important for school administrators to provide technological information support to education stakeholders. School administrators; It is in a position to coordinate the exchange of technological information within the organization. School administrators can benefit from the technological committee to be established at the school while providing information exchange. According to the research results; teachers think that the formation of technology board at school is not sufficient. Elimination of this deficiency; It is important for analyzing the missing infrastructure and for the development of the institution. It is thought that the existence of a committee to consult with teachers or students regarding the lack of technological knowledge will eliminate the reservations regarding the use of technology. School administrators; determining the technology needs of teachers and students in educational activities; They need to analyze the effect of technology use on student learning. It is thought that the results obtained through this analysis will play a role in the formation of education policy.

References

Baltacı, A. (2018). Nitel Araştırmalarda Örnekleme Yöntemleri ve Örnek Hacmi Sorunsalı Üzerine Kavramsal Bir İnceleme. Bitlis Eren Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 7(1), 231-274.

Baş, D. E. (2012). The Relationship Between Elementary School Administrators' Technology Leadership Roles And School Climate [Master Thesis], Maltepe University, Social Sciences Institute, İstanbul.

Büyüköztürk, Ş., Kılıç Çakmak, E., Akgün, Ö. E., Karadeniz, Ş., & Demirel, F. (2018). Eğitimde Bilimsel Araştırma Yöntemleri (25.Baskı ed.). Pegem Akademi.

Çıkrık, S. (2020). Teachers Examining the Technology Leadership Competencies of School Principals. [Master Thesis], Pamukkale University, Department of Education Management, Denizli.

Deniz, L., & Teke, S. (2020). Okul Yöneticilerinin Teknoloji Liderliği Rollerinin Öğretmen Görüşleri Doğrultusunda Değerlendirilmesi. Yüzüncü Yıl Üniversitesi Eğitim Fakültesi Dergisi, 17(1), 351- 373.

Gençay, A. & Balyer, A. (2019). İlkokul ve Ortaokul Yöneticilerinin Teknoloji Liderliğine İlişkin Yeterlikleri. YILDIZ Journal of Educational Research, 4(1), 38-57.

Gerçek, M, M. (2016). The Investigation Of The Correlation Between School Administrators' Level Of Technological Leadership And Their Effectiveness, As Measured By The Perception Of Teachers In Private Schools. [Master Thesis], Afyon Kocatepe University, Afyon.

Irmak, M. (2015). İlkokul ve Ortaokul Öğretmenlerinin, Yöneticilerinin "Teknoloji Liderliği" Düzeylerine İlişkin Algıları. [Yüksek Lisans Tezi], T.C Pamukkale Üniversitesi, Denizli.

Kabakçı Yurdakul, I. 4.Ünite: Evren ve Örneklem. Bilimsel Araştırma Yöntemleri. Ed.

KKTC Milli Eğitim Bakanlığı. (b.t.). www.mebnet.net

Lowhorn, G. (2007). Qualitative and Quantitative Research: How to Choose the Best Design. Presented at Academic Business World International Conference. Nashville, Tennessee.

Okeke, N. L. (2019). School Technology Leadership: A New Concept. International Journal of Innovative Development and Policy Studies, 7(2), 50-56.

Özkan, T., Tokel, A., Çelik, M., & Öznacar, B. (2017). Evaluation of Technology Leadership in the Context of Vocational School Administrators. Proceedings of the 9th International Conference on Computer Supported Education, 1, 727-731.

Öztaban, A. (2020). Fulfilment Levels Of School Administrators' Technology Leadership Roles. [Master Thesis], Aydın Adnan Menderes University, Aydın.

Öztürk, D. (2021). Examining The Technological Leadership Self-Competences Of High School Principles. [Master Thesis], Bursa Uludağ University, Bursa.

Sincar, M. (2009). An Analysis of Turkish Elementary School Administrators' Technology Leadership Roles. [Doctoral Thesis]. İnönü University / Social Sciences Institute, Malatya.

Teke, S. (2019). Okul Yöneticilerinin Teknoloji Liderliği Rollerinin Öğretmen Görüşleri Doğrultusunda Değerlendirilmesi. [Yüksek Lisans Tezi], Marmara Üniversitesi, İstanbul.

Tezel, B. (2020). Okul Yöneticilerinin Gösterdiği Teknoloji Liderliği Biçimi İle Okul Başarısı ve Öğretmenlerin Akademik İyimserliği Arasındaki İlişkinin İncelenmesi. [Yüksek Lisans Tezi], Recep Tayyip Erdoğan Üniversitesi, Rize.

Toker Gökçe, A. (2008). Distance Education in the Process of Globalization. Journal of Ziya Gökalp Faculty of Education, (11), 1-12.

Uysal Balaban, N. (2012). Okul yöneticilerinin teknoloji liderliği rolleri ile bilgisayar kaygı düzeyleri arasındaki ilişkinin belirlenmesi (Yayımlanmamış Yüksek Lisans Tezi). Anadolu Üniversitesi, Eğitim Bilimleri Enstitüsü. Eskişehir.

World Health Organization. (2019). Health Topics. Timeline: WHO's COVID-19 response.https://www.who.int/emergencies/diseases/novel-coronavirus-2019/ interactive-timeline#category-Advice