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Technology Leadership of Education Administers and Innovative Technologies in Education: A Case Study of Çorum City*

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Abstract In this global world in which educational technologies have developed at such a great pace, it is possible to say that administrators in the education sector are obliged with serious roles with regard to keeping up with the evolving technology and the management of education in this virtual environment. In the present study utilizing screening research method, technologic leadership attitudes of administrations in educational domain were investigated. The survey titled "Technology Leadership of Education Administers" developed by Banoğlu [24] was employed in this study. The research universe consisted of administers at the public schools located in Çorum City. The research sampling was composed of 161 school administers who participated in the "Technology Leadership of Education Administers" survey on a volunteer basis. The acquired data was analyzed through the SSPS 22 package software with descriptive and comparative statistical methods. The analysis results were presented in the tables in the findings section.

Keywords Technology Leadership, Technology Leadership of Education Administers, Innovative Technologies in Education Ship

1. Introduction

Today technology is constantly developing, used in every field of life and causing various changes. It is not likely that education-teaching activities will not be affected by technological developments. Studies have revealed that educating-teaching and administration activities are carried out more rapidly and safely thanks to technology. Also, students and parents' expectations from schools and the education systems are increasing. Students and parents want technological devices to be used in an educational setting to receive more quality education. In this context, the importance of technology is boosted and it is a must to use technology in educating-teaching activities.

Many definitions of technology have been made in different ways in the literature. Technology was defined by the International Technology Education Association (ITEA, 2007) as changing, modernize and converting the natural setting to satisfy perceived human needs and requests. The ITEA (2007) stated that learners can gain technology literacy with the help of education [1]. This statement requires teachers to be technology literate [2].

Technology is a motivator in terms of students' individual learning needs and styles. Learning occurs better when students work in groups using technology.

The Colorado Department of Education (CDE) defines technology literacy as the competency to;

- communicate,
- solve problems,
- have access to, design, integrate, evaluate and manage information,
- acquire lifelong information and skills in the 21st century [3].

In studies carried out by the International Technology Education Association in the US, technology literacy is defined as "an individual who knows what technology is, how it emerged, how it shapes society, and how society shapes it" [1]. In other words, technologically literate individual inquires technological processes and innovations critically. The individual who has a critical point of view towards technology is intellectual enough to understand the benefits and damages of every technological development and to analyze the political and social effects that can accelerate or slow down its cost and development, and thus will have the opportunity to affect her/his environment and shape her/his future [4][5].

James Finn, a famous education technologist, defines technology as follows: 'Besides using machinery, technology is the point of view that will create solutions

appropriate with problems' degree of difficulty, technical solution possibilities, and economical values for problems stemming from both humans and things using systems, operations, management, and control mechanisms [6].

Technology is a significant part of directing discoveries by making use of data sharing most effectively [7]. According to Volti, technology is a system that produces objects and techniques by using information and organization to reach certain targets. Also, technology is the devices and techniques developed and applied by humans; thanks to technology humanity has done many hard to do things thought hard to achieve [8]. According to Simon, technology is a rational discipline designed to dominate the physical nature by implementing scientifically-defined laws. According to McDermott [9], technology is a rational system through which a few technically qualified individuals control big masses, daily events, and machines in an organized way [10].

Özkul and Girginer pointed out the following reasons for using technology in education [11]:

- Increasing access to education and teaching
- Increasing the quality of teaching
- Decreasing education costs
- Adapting to technological changes
- Students gaining skills they will need in their work lives and private lives.

Some researchers believe that more use of technology in education will increase education opportunities and its quality [12]. Based on this basic assumption, many projects are done and applied to extend and use technological devices effectively in schools in Turkey by the Ministry of National Education (MNE). Projects such as the Basic Education Project, Developing National Education Project, Computer-Assisted Education Project, Industrial Schools Projects, Non-formal Vocational Training Project, Catch the Era 2001 Project, World Links Project, Education Portal, Access to Information Portal, Skoool.tr, Think.com Portal, Intel Teacher Program, Intel Student Program, Innovative Teachers Projects, Ministry of National Education Information System (MEBBİS), e-In-service Training, e-Transportable Project, and e-School Projects are applied by the Ministry of National Education and are related to technologies known as education and information technologies.

In line with the developments in information technologies in the 2000s, school administers have been faced with demands such as purchasing information equipment for schools, appointing a full-time or part-time IT specialist in schools, and training teachers to use new technological devices [13]. Some studies have been done with respect to how effectively these technologies are used and what kind of problems emerge after investments in using technology has been done. The cost of and investing in integrating technology with school systems have brought on questions about the effectiveness of technology in schools [13] [14]. It has been pointed out that many schools are not aware of the benefits of education technologies despite spending huge amounts for purchasing these technologies. Schrum [15] stated that although there were computer-assisted education software, distance learning and smart boards in schools, their effect on school reform is limited. Studies carried out in developing countries to reveal the state of school administers' benefiting from education technologies revealed that many headmasters had little information and few skills, and were rather incompetent [16].

Weber [14] indicated that the biggest problem in terms of using education technologies stemmed from unprepared headmasters and that headmasters should direct teachers with respect to effective use of technology. Based on these studies, it can be said that headmasters are one of the most significant element affecting the use of education technologies in schools. It can also be said that headmasters are not trained well enough regarding their leadership of using education technologies during their pre-service and in-service trainings; however, they are becoming more and more responsible for using education technologies in schools.

2. Literature

Şişman-Eren [17] specified that headmasters' technology leadership behaviors did not differ by gender, branch, educational status, time passed after graduation, professional seniority, seniority in working as a headmaster, and region they worked, but it differed by trainings they received. Moreover, there was a meaningful relationship between headmasters' perceptions of their own competency in using technology and leadership behaviours. Headmasters who received training in education technologies and use, also headmasters who felt more competent in using education technologies showed more leadership behaviours.

In the study carried out by Banoğlu [18] in Kadıköy and Maltepe districts in Istanbul to determine primary and secondary school administrators' technology leadership competencies, ISTE technology leadership standards were used [19]. These standards were translated into Turkish; an assessment tool was developed and administered to 134 school administrators. The study results showed that school administrators were sufficiently competent in terms of technology leadership. The lowest level of competency was found to be under the sub-dimension "leadership and vision".

Çakır [20] studied the integration of technology with a leadership point of view in secondary schools and examined the headmasters' roles in integrating technology in schools and responsibilities of computer teachers. A questionnaire was administered in the study of which the participants were 38 school administrators and 35 computer teachers working in Amasya city in Turkey. The results showed that administrators' attitudes were mostly positive, but there were some negative attitudes towards some elements. Also, it was specified that teachers were aware of Web 2.0 technology, but some participants stated that they were not planning to use such technologies in their classrooms.

Görgülü found in his dissertation study that teachers thought school administrators showed technology leadership competencies most of the time (2.83). Also, teachers stated that school administrators exhibited behaviours stated in the sub-dimensions of technology leadership most of the time. Again, Görgülü determined that school administrators' perceptions towards technology leadership competencies were meaningfully higher compared to teachers' perceptions regarding school administrators' technology leadership and competencies [21].

Weng and Tang in their study [22] dwelled on four main themes regarding education administrators' technology leadership: (1) level of technology leadership adopted by administrators in primary schools, (2) level of school administration's awareness, (3) the relationship between administrators' technology leadership strategies and school administration's effectiveness, (4) whether school administration's effectiveness can be predicted via administrators' technology leadership strategies. The participants of the study were 332 administrators of 82 secondary schools in Taiwan and on the islands of the three seas. Semi-structured interviews, expert validity studies, and pilot study were conducted to develop the "Technology Leadership Strategies and School Administrative Effectiveness Scale". According to the results, it was found that primary school administrators were quite aware of using technology leadership strategies and their effectiveness levels in terms of school administration was high. The conclusion also showed that technology leadership strategies had positive effects on the effectiveness of school administration.

Titrek [23] examined headmasters' innovation management levels with 1436 participants from Istanbul, Kocaeli, and the Sakarya cities in Turkey. Titrek used the "Innovation Management Scale" of which the validity was previously done. In this study, a descriptive model was used to compare headmasters' characteristics such as gender, age, residence, and seniority with their innovation management levels. Positive differences were observed in favour of male participants with regard to gender. Furthermore, headmasters' innovation management levels were higher than teachers'.

Irmak [24] conducted a study to determine secondary and primary school teachers' and school administrators' perceptions level of technology leadership and reveal to what extent these roles affected their performances. In this context, population of the study was collected of 3933 teachers working in 139 primary and elementary schools in the Denizli city centre between 2012 and 2013. The study was done using a "Screening Model". A 5-point likert type scale with 29 items developed by Sincar [25] was used in this study and the study results showed that the teachers believed school administrators showed moderate technology leadership behaviours. Again, school administrators showed behaviours in the "anthropocentricism", "vision", "communication and cooperation" sub-dimensions moderately. They "Often" (Sufficiently) showed behaviours specified under "Support" sub-dimension.

3. Research Objectives and Research Questions

The aim of the study is to supply answers to the following questions:

Q1: Does the whole scale and all of its sub-dimensions weighted average scores of the administrators differ based on institution type?

Q2: Does the whole scale and all of its sub-dimensions weighted average scores of the administrators differ based on their positions?

Q3: Does the whole scale and all of its sub-dimensions weighted average scores of the administrators differ based on their years of seniority?

Q4: Does the whole scale and all of its sub-dimensions weighted average scores of the administrators differ based on gender?

Q5: Do the whole scale and all of its sub-dimensions weighted average scores of the administrators differ based on institutions' place?

4. Materials and Methods

This study aims to reveal education administrators' technology leadership competencies and variables affecting these competencies. A screening model was adopted and the sample for this study was composed of school administrators (headmaster, deputy head-manager and deputy manager) working at formal pre-schools, primary schools, secondary schools, high schools, vocational and technical high schools, counselling and research centres, teacherages, and public education centres located in the Çorum city centre between 2015 and 2016. Permission was obtained from the Çorum Provincial Directorate of National Education and the Çorum Governorate before the study was conducted. The sample data was collected from 161 school administrators from 526 institutions who completed the "Education Administrators' Technology Leadership Competencies" scale voluntarily. More information on the scale can be obtained from www.moodle.hitit.edu.tr/technology-leadership-of-school-administrators. Information regarding the participants is given in Table 1.

As it is seen in Table 1, 9 of the school administrators work in pre-school institutions, 59 of them work in primary schools, 49 of them work in secondary schools, 24 of them work in high schools, and 10 of them work in vocational and technical high schools. One hundred and twenty five of the school administrators are headmasters, 2 of them are deputy head-managers, and 34 are deputy managers. Fifteen of the administrators' year of seniority was between 1 and 8, 49 of the administrators' year of seniority was between 9 and 16, 42 of the administrators' year of seniority was between 17 and 24, 46 of the administrators' year of seniority was

between 25 and 32, and 9 of the administrators' year of seniority was 33 and above. One hundred and forty of the administrators were males and 21 of them were females.

The data collection tool was taken from "Developing and Reliability Study of "Education Administrators' Technology Leadership Competencies Scale" developed by Banoğlu [27] and the writer's permission was obtained. Reliability of the data collection tool was done and Cronbach's Alpha reliability co-efficient was found to be 0.943. The data collection tool had 32 items to measure school administrators' technology leadership competencies. Descriptive statistics were used to analyze the items regarding personal information, received training on information technologies and using information technologies. The T-test and Levene test were used to identify the relationship between received training on information technologies, using information technologies and gender. One-way variance analysis (ANOVA) was used to identify the relationship between received training on information technologies, using information technologies and school type, professional seniority. However, firstly, the Levene test was administered for variance analysis and variance homogeneity was tested. When p was <0.05 in the Levene test (when variances were not homogeneous), the Kruskal Wallis- H Test was used. The Mann-Whitney U test was administered to determine the source of difference that emerged after the Kruskal Wallis- H Test.

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Table 1. Information Regarding the Participants

		N	%
Type of Institutions	Primary School	59	36.6
	Secondary School	41	25.5
	Religious Vocational Secondary School	8	5.0
	Anatolian High School	22	13.7
	High School of Science	2	1.2
	Vocational and Technical High School	10	6.2
	Preschool	9	5.6
	Public Education Centre	2	1.2
	Teacherage	1	0.6
	Other Institutions	7	4.3
Type of Task	School Manager	125	77.6
	The Chief Deputy Principal	2	1.2
	The Deputy Director	34	21.1
Seniority	1-8	15	9.2
	9-16	49	30.4
	17-24	42	26.2
	25-32	46	28.6
	33+	9	5.6
Age Ranges	27-34	27	16.8
	35-42	49	30.4
	43-50	52	32.3
	51-58	26	16.0
	59+	7	4.3
Age	Male	140	87.0
	Female	21	13.0
Total		161	100

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5. Findings

Administrators' institutions were grouped by types. Accordingly, 11 groups were created: primary school, secondary school, Imam Hatip High School, Anatolian High School, Health High School, Pre-school, Public Education Centre, Teacherage, and others.

The Levene test was administered to find whether variances among these groups were equal or not and the results can be seen in Table 2. According to these results, variances were not homogenous (F=3.179; p<.05).

It was found that administrators of teacherages scored highest from the whole technology leadership scale regarding weighted average (X=4.56) and while administrators of pre-schools scored lowest (X=3.99), administrators teacher's house scored highest (X=4.56). Other sub-dimensions and weighted averages can be seen in Table 3.

Table 2. Homogeneity of Variances Test Scores

Levene Statistic	df1	df2	Sig.
3.179	3	77	.029

Table 3. Weighted Average Scores of the Whole Scale and its Sub-dimensions by Institution Type

Type of School	Visionary Leadership	Digital-age Learning Culture	Excellence in Professional Development	Systemic Improvement	Digital Citizenship	All Sizes
Primary School	3.9138	4.0621	3.8750	3.6497	4.2712	3.9603
Secondary School	3.7785	4.0569	3.8506	3.5366	4.2927	3.8963
Religious Vocational Secondary School	4.1146	4.2083	4.2031	3.6250	4.5625	4.1836
Anatolian High School	3.9130	4.1884	3.9674	3.7101	4.2536	3.9973
High School of Science	3.9583	4.5000	4.0000	3.8333	4.4167	4.0938
Vocational and Technical High School	3.5417	3.8000	3.5750	3.3333	4.2167	3.6813
Preschool	3.4722	3.7037	3.6250	3.0741	3.7778	3.5521
Public Education Centre	3.9583	4.1667	4.0000	4.3333	4.2500	4.0781
Teacherage	4.7500	4.0000	4.5000	4.3333	4.6667	4.5625
Other Institutions	3.7024	3.8571	3.6786	3.6667	3.8571	3.7366
Total	3.8390	4.0473	3.8642	3.5926	4.2438	3.9176

Table 4. ANOVA Results of the Weighted Average Scores of the Whole Scale and Sub-dimensions by Institution Type

	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Visionary Leadership	Between Groups	4.327	9	.481	1.033	.416
	Within Groups	70.717	152	.465		
	Total	75.043	161			
Digital-age Learning Culture	Between Groups	3.050	9	.339	.567	.823
	Within Groups	90.920	152	.598		
	Total	93.971	161			
Excellence in Professional Development	Between Groups	3.249	9	.361	.637	.764
	Within Groups	86.107	152	.566		
	Total	89.356	161			
Systemic Improvement	Between Groups	5.540	9	.616	.641	.761
	Within Groups	146.016	152	.961		
	Total	151.556	161			
Digital Citizenship	Between Groups	4.204	9	.467	1.089	.374
	Within Groups	65.192	152	.429		
	Total	69.397	161			
All Sizes	Between Groups	3.358	9	.373	0.889	.537
	Within Groups	63.802	152	.420		
	Total	67.160	161			

Table 4 shows that there was no difference between scores the administrators obtained from the whole scale and its sub-dimensions by institution type. In other words, administrators' technology leadership and its sub-dimension leadership scores do not differ by institution type.

Table 5. Weighted Average Scores of the Whole Scale and its Sub-dimensions by Administrators' Positions

	Visionary Leadership	Digital-age Learning Culture	Excellence in Professional Development	Systemic Improvement	Digital Citizenship	All Sizes
School Manager	3.8300	4.0850	3.9080	3.6267	4.2640	3.9373
The Chief Deputy Principal	4.0800	4.1660	3.8750	4.0000	4.3333	4.0781
The Deputy Director	3.8400	3.9040	3.7071	3.4476	4.1667	3.8384
Total	3.8390	4.0470	3.8642	3.5926	4.2438	3.9176

According to Table 5, deputy head-managers scored highest in the "Visionary Leadership, Digital Learning Culture, Systematic Development, and Digital Citizenship" sub-dimensions and the Whole scale. Headmasters had the highest weighted average scores in Perfection in the Professional Development sub-dimension.

Tablo 6. ANOVA Results of the Weighted Average Scores of the Whole Scale and its Sub-dimensions by Administrators' Positions

	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Visionary Leadership	Between Groups	0.123	2	0.062	0.131	0.878
	Within Groups	74.92	159	0.471		
	Total	75.043	161			
Digital-age Learning Culture	Between Groups	0.319	2	0.16	0.38	0.685
	Within Groups	66.84	159	0.42		
	Total	67.16	161			
Excellence in Professional Development	Between Groups	0.92	2	0.46	0.786	0.457
	Within Groups	93.05	159	0.585		
	Total	93.971	161			
Systemic Improvement	Between Groups	1.103	2	0.552	0.994	0.372
	Within Groups	88.253	159	0.555		
	Total	89.356	161			
Digital Citizenship	Between Groups	1.213	2	0.606	0.641	0.528
	Within Groups	150.343	159	0.946		
	Total	151.556	161			
All Sizes	Between Groups	0.275	2	0.138	0.317	0.729
	Within Groups	69.121	159	0.435		
	Total	69.397	161			

The Analyzed results presented in Table 6 show that there was no difference between scores the administrators obtained from the whole scale and its sub-dimensions by their positions. That is, administrators' technology leadership and its sub-dimension leadership scores do not differ by positions type.

Table 7. Weighted Average Scores of the Whole Scale and its Sub-dimensions by Administrators' Years of Seniority

Seniority	Visionary Leadership	Digital-age Learning Culture	Excellence in Professional Development	Systemic Improvement	Digital Citizenship	All Sizes
1-8	3.46	3.90	3.60	3.10	4.14	3.63
9-16	3.46	3.90	3.61	3.10	4.24	3.63
17-24	3.68	3.97	3.68	3.40	4.13	3.76
25-32	3.98	4.16	4.02	3.88	4.33	4.06
33+	4.22	4.26	4.25	4.00	4.56	4.27

When Table 7 is examined, it is seen that participants working as administrators for 33 years and more scored highest in the Whole scale and its sub-dimensions. This means that participants working as administrators for 33 years and more scored highest in technology use leadership average scores and its sub-dimensions "Visionary Leadership, Digital Learning Culture, Perfection in Professional Development, Systematic Development, and Digital Citizenship".

Table 8. Homogeneity Test of the Variances

Factor	Levene Statistic	df1	df2	S.
Digital Citizenship	1.228	4	157	0
Visionary Leadership	1.361	4	157	0
Digital-age Learning Culture	1.045	4	157	0
Excellence in Professional Development	1.298	4	157	0
Systemic Improvement	1.898	4	157	0
All Sizes	1.211	4	157	0

The Levene test results done to check homogeneity among variances can be seen in Table 8. Accordingly, all variances were homogeneous; that is, equal (p>.05)

Table 9. ANOVA Results of the Weighted Average Scores of the Whole Scale and Sub-dimensions by Administrators' Years of Seniority

	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Visionary Leadership	Between Groups	5.721	4	1.430	3.239	.014
	Within Groups	69.323	157	.442		
	Total	75.043	161			
Digital-age Learning Culture	Between Groups	1.648	4	.412	.700	.593
	Within Groups	92.323	157	.588		
	Total	93.971	161			
Excellence in Professional Development	Between Groups	5.152	4	1.288	2.402	.050
	Within Groups	84.204	157	.536		
	Total	89.356	161			
Systemic Improvement	Between Groups	10.646	4	2.662	2.966	.021
	Within Groups	140.909	157	.898		
	Total	151.556	161			
Digital Citizenship	Between Groups	1.939	4	0.485	1.128	.345
	Within Groups	67.458	157	.430		
	Total	69.397	161			
All Sizes	Between Groups	4.458	4	1.115	2.791	.028
	Within Groups	62.702	157	.399		
	Total	67.160	161			

Table 9 shows the ANOVA test results of the Whole scale and sub-dimensions scores by administrators' years of seniority. There was not a meaningful difference between digital era learning culture, digital citizenship and years of seniority ($p>.05$). It was also seen that there was a meaningful difference between technology leadership scores and the weighted average scores obtained from visionary leadership, perfection in professional development, and systematic development sub-dimensions ($p<=.05$). Administrators' technology leadership, visionary leadership, perfection in professional development and systematic development scores differ by year of seniority.

Table 10. Weighted Average Scores of the Whole Scale and Sub-dimensions by Administrators' Ages

Age	Visionary Leadership	Digital-age Learning Culture	Excellence in Professional Development	Systemic Improvement	Digital Citizenship	All Sizes
27-34	3.72	4.05	3.85	3.52	4.25	3.86
35-42	3.75	3.95	3.75	3.45	4.16	3.82
43-50	3.86	4.01	3.82	3.56	4.21	3.90
51-58	3.98	4.23	4.09	3.91	4.38	4.10
59+	4.23	4.29	4.18	3.95	4.50	4.25

According to Table 10, the administrators aged 59 and above scored highest in the Whole scale and its sub-dimensions. Technology use leadership average scores and visionary leadership, digital era learning culture, perfection in professional development, systematic development, and digital citizenship scores of the administrators aged 59 and above were highest. This result overlaps with the weighted averages scores by year of seniority.

Table 11. Homogeneity Test of Variances

Factor	Levene Statistic	df1	df2	Sig.
Digital Citizenship		4	157	0.287
Visionary Leadership	1.524	4	157	0.198
Digital-age Learning Culture	1.732	4	157	0.146
Excellence in Professional Development	1.128	4	157	0.346
Systemic Improvement	2.806	4	157	0.068
All Sizes	1.262	4	157	0.388

The Levene test results done to check homogeneity among variances can be seen in Table 11. Accordingly, all variances were homogeneous; that is, equal ($p>.05$).

Table 12. ANOVA Results of the Weighted Average Scores of the Whole Scale and Sub-dimensions by Administrators' Ages

	Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Visionary Leadership	Between Groups	2.371	4	.593	1.281	.280
	Within Groups	72.672	157	.463		
	Total	75.043	161			
Digital-age Learning Culture	Between Groups	1.776	4	.444	.756	.555
	Within Groups	92.164	157	.587		
	Total	93.971	161			
Excellence in Professional Development	Between Groups	2.687	4	.672	1.217	.306
	Within Groups	86.669	157	.552		
	Total	89.356	161			
Systemic Improvement	Between Groups	4.711	4	1.178	1.259	.288
	Within Groups	146.845	157	.935		
	Total	151.556	161			
Digital Citizenship	Between Groups	1.343	4	.336	.775	.543
	Within Groups	68.054	157	.433		
	Total	69.397	161			

According to the analysis results shown in Table 12, there was not a difference between administrators' scores from the Whole scale and sub-dimensions and their ages. That is, administrators' technology leadership and sub-dimension leadership scores do not differ by their ages.

Table 13. T-Test Results of the Weighted Average Scores of the Whole Scale and Sub-dimensions by Gender

Factor	Age	N	X	Std. Dev.	df	t	p
All Sizes	Male	140	3.92	0.66	160	0.111	0.912
	Female	21	3.90	0.54			
Visionary Leadership	Male	140	3.84	0.69	160	0.042	0.967
	Female	21	3.83	0.62			
Digital-age Learning Culture	Male	140	4.04	0.78	160	0.287	0.774
	Female	21	4.09	0.65			
Excellence in Professional Development	Male	140	3.85	0.76	160	0.495	0.621
	Female	21	3.94	0.62			
Systemic Improvement	Male	140	3.61	0.98	160	0.717	0.750
	Female	21	3.45	0.91			
Digital Citizenship	Male	140	4.26	0.68	160	0.883	0.095
	Female	21	4.13	0.52			

Table 13 shows that gender has no effect on technology leadership total scores and sub-dimensions scores. Also, weighted average scores of males (X=3.92) were slightly higher than females' scores (X=3.90). Both genders had the same average scores in visionary leadership, but females had the highest average scores in digital age learning (X=4.09) and perfection in professional development (X=3.94), whereas males had the highest average scores in systematic development (X=3.61) and digital citizenship (X=4.26).

Table 14. T-Test Results of the Weighted Average Scores of the Whole Scale and Sub-dimensions by Institutions' Place

Factor	Hometown	N	X	Std. Dev.	df	t	p
All Sizes	City	98	3.87	0.65	160	1.1	0.275
	County	63	3.99	0.65			
Visionary Leadership	City	98	3.80	0.68	160	0.84	0.404
	County	63	3.89	0.7			
Digital-age Learning Culture	City	98	3.96	0.76	160	1.83	0.069
	County	63	4.18	0.76			
Excellence in Professional Development	City	98	3.84	0.76	160	0.58	0.563
	County	63	3.90	0.72			
Systemic Improvement	City	98	3.53	0.94	160	0.95	0.343
	County	63	3.68	1.01			
Digital Citizenship	City	98	4.18	0.67	160	1.37	0.174
	County	63	4.33	0.63			

According to Table 14, institutions' place had no effect on technology leadership total scores and its sub-dimensions' scores. Interestingly though, administrators' weighted average scores obtained from the Whole scale and its sub-dimensions are higher in districts. This may stem from the fact that younger administrators with shorter position terms work in these districts. It may be thought that younger administrators have high levels of technology literacy and technology leadership skills.

When the other studies are examined, according to seniority years of school administrator technology leadership self-efficacy and sub-dimensions of this self-efficacy were found to be high. Particularly it shows that significant differences happen to participation in IT in-service programs [26].

6. Conclusion

The findings obtained from the analysis of the "Education Administrators Technology Leadership" scale developed by Banoğlu [27] are interpreted in this section. Technology leadership competency scores of pre-schools were lower compared to the other school types. This may indicate that these schools' needs are less when students' age levels and schools' technological needs are considered.

Scores by positions types are positive when the Whole scale and its sub-dimension scores are examined. It is striking that headmasters scores were higher in "perfection in professional development" sub-dimension. "Perfection in professional development" is defined as "Through contemporary technology and digital tools, education administrator creates an environment to enable professional development of teachers to develop learners' learning"[27]. In this sense, it is an expected result for headmasters to score higher in this sub-dimension.

The findings show that there was a meaningful difference between the period of office and "visionary leadership, perfection in professional development, and systematic development" sub-dimensions. Besides, all sub-dimensions of the scale and the period of office increased or decreased in the same direction. It can be said that professional experiences of administrators affects their technology competencies positively.

When the literature is examined, it is seen that administrators knowledgeable with information technology and technology training have better technology competencies. Therefore, it is suggested that thanks to in-service technology trainings given to school administrators, they will possess better technology leadership and competency levels. Also, since technology competency is directly proportionate to year of seniority and age, young administrators and senior administrators should gather in various activities and thus, they will be able to share their knowledge of technology competency in schools.

Note

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