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Abstract

The purpose of this study is to analyze the relationships among innovation management competencies of school administrators, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers and to determine the predictive value of innovation management competencies of school administrators and teachers' lifelong learning tendencies have on their individual innovativeness levels. The sample of the study consist of 302 teachers from 38 public schools in Güngören province of Istanbul city. A relational survey model has been used and the data have been obtained utilizing three scales: “Innovation Management Scale in Schools”, “Individual Innovativeness Scale”, and “Lifelong Learning Tendency Scale”. The data have been analyzed using correlation and regression analyses. According to the research results, a positive correlation has been found among perceived innovation management competencies of school administrators, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers. It has been determined that perceived school administrators 'innovation management competencies predicted teachers' individual innovation levels by 5% and lifelong learning tendencies of teachers by 3%. Teachers' lifelong learning tendencies predicted their individual innovativeness level by 17%. Besides, perceived school administrators 'innovation management competencies and lifelong learning tendencies of teachers have been determined to explain 19 % of the variance in the individual innovativeness level of teachers. This effect size is "medium".

Keywords: Innovation, Innovation Management, Individual Innovativeness, Lifelong Learning

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El papel predictivo de la gestión de la innovación con el aprendizaje permanente sobre la innovación individual: un examen a los profesores

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Resumen

El propósito de este estudio es analizar las relaciones entre las competencias de gestión de la innovación de los administradores escolares; las tendencias de aprendizaje permanente y los niveles individuales de innovación de los docentes; determinar el valor predictivo de las competencias de gestión de la innovación de los administradores escolares y las tendencias de aprendizaje permanente de los docentes en los niveles individuales de innovación. La muestra consta de 302 profesores de 38 escuelas públicas en la provincia de Güngören (Estambul). Se ha utilizado un modelo de encuesta relacional y los datos se han obtenido utilizando tres escalas: "Escala de gestión de la innovación en las escuelas", "Escala de innovación individual" y "Escala de tendencia al aprendizaje permanente". Los datos se han analizado mediante análisis de correlación y regresión. Según los resultados de la investigación, se ha encontrado una correlación positiva entre las competencias percibidas de gestión de la innovación de los administradores escolares, las tendencias de aprendizaje permanente de los profesores y los niveles de innovación individual de los profesores. Se ha determinado que las competencias de gestión de la innovación percibidas por los administradores escolares predijeron los niveles de innovación individual de los profesores en un 5% y las tendencias de aprendizaje permanente de los profesores en un 3%. Las tendencias de aprendizaje permanente de los profesores predijeron su nivel de innovación individual en un 17%. Además, se ha determinado que las competencias de gestión de la innovación percibidas por los administradores escolares y las tendencias de aprendizaje permanente de los profesores explican el 19% de la variación en el nivel de innovación individual de los profesores. Este tamaño de efecto es "medio".

Palabras clave: Innovación, gestión de la innovación, Innovación individual, Aprendizaje permanente

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The new world order, whose main dynamic is transformation and innovation, also transformed the structure of societies and turned the term of information society into an important actor in the digital information age. The dominant power that has put its signature on this period, which is rapidly affected by innovations in every field to ensure globalization and sustainability, is the qualified brainpower that has passed the filter of science. The strength of the countries in the new order is measured not by how much their natural resources are or by their industrialization rate, as before, but by the brainpower and qualified human capital that they have trained. Parallel to this their reputation also increases as they have a say in science and technology. In order to exist in the new world order, states spend the most share of their finances on education, particularly on developing human capital (Çengel, 2009). In other words, the policy followed in training qualified human effort will also increase development, videlicet the economic improvement. National intellectual human capital means the qualified source of brainpower provides added value to the country and is indispensable for sustainable development.

The United Nations Development Organization (UNDP) emphasized in its report titled Human Development Report (2019) that there is a relationship between the strength of Human Development Indexes, human effort, economic welfare level, and growth rate. The fundamental dynamics of transformation and the digital age can be count as; integration of human resources and innovation, enable individuals to acquire 21st-century skills and urge them to apply these skills to their lives. These skills can be stated as; acquiring an internalized lifelong learning habit, not having problems in reaching and practicing information, able to find solutions, and being open to innovations (American Association of Colleges of Teacher Education [AACTE], 2010). According to the Oslo Guide (2005) innovation in the field of education; is expressed as the process and results that can control practices such as ensuring the development of innovation and creativity by evaluating all the elements in the education and training process, the management and supervision of educational organizations, and the implementation of innovations and changes. The practices that are tried to be implemented are defined as improving education and renewal in education.

Schools, like social organizations, cannot be considered independent from the society they live in and the world. They are affected by the change in their environment and they enable their environment to change and transform, therefore schools cannot remain unresponsive to the dynamics that create change. Schools no longer train human resources to an industrial society anymore but to a knowledge-based ecosystem. Since the needs of the information society are different from industrial society, their expectations from schools will certainly be different too. In order to fulfill these expectations schools must obtain information from the ecosystems that they are in and share it within the organization to make it meaningful and then carry it to their organizational DNA(Çalık, 2010).

The roles of schools that prepare students for the digital age are changing as a result of the rapid globalization that arose from economic, technological, and social parameters. One of the primary tasks of the schools has become to educate students with sufficient technological knowledge and skills. With technological advances and the development of new teaching methods, schools are executing innovation and change to catch up with the pace of the digital age and to provide a qualified learning environment. Innovation and management of innovation are important factors in keeping up with the changing world. Because the way to make the school different and efficient is passing through creativity and innovation (Hacıfazlıoğlu, 2016).

Watt (2002) stated that the innovative school is not rigid in its structure and processes, it also provides the exchange of knowledge and skills that support teamwork and has features that enable all stakeholders to have fast access to resources and it gives opportunities to establish strong social relationships. Education is one of the most important building blocks which determines the existence and future of society. One of the most important titles of the digital information age is “Innovation”. The era we are in is an era in which the effect of technology on science increases and the transition from science to technology shortens. By way of explanation, science transforms into a direct productive force (Erdemet, 2017). In the new world order, it can be said that organizations that have an innovation culture, open to change and show agility to adapt innovation gain significant advantages for sustainable development.

In other words, the organization, which absorbs the new thinking systematic and new business models of the new age, creates an environment that will motivate success (Erdoğan, 2012).

As mentioned by Adair (2008), the innovative organizational structure does not occur randomly, it is necessary to use leadership and managerial skills together to build an innovative organizational structure. Trying to make a difference rather than using the traditional way can cause some unexpected difficulties, and in this case, organizations need leaders who have already proved their leadership skills (Drucker, 2005). For instance, the leadership styles of school administrators affect school culture (Özgenel, 2020), organizational cynicism (Özgenel and Hıdıroğlu, 2019), school happiness (Şahin and Özgenel, 2020), organizational health of the school (Özgenel and Aksu, 2020) and teachers' performance (Mert and Özgenel, 2020; Özgenel, Mert, and Parlar, 2020). When the related literature is evaluated together, it can be said that school administrators have an important effect on school outputs and teachers as a leader. According to Hersey and Blanchard (2004), leaders have important roles in building an innovative climate in organizations and these leadership roles in educational organizations are mostly the roles that expected to be performed by school administrators.

Stevenson and Kaafarani (2012) used the expression "Sine qua non-bu" which means "nothing happens without a leader" in their studies. In other words, they stated that innovations cannot occur without a leader. In educational organizations, teachers need to be aware of the gains of change both for themselves and their students to internalize change. School stakeholders' trust and acceptance of change are considerably related to their belief in the necessity of change. The most important role in this respect belongs to school administrators and their innovation management competencies (Çolakoğlu, 2005).

According to Day and Leithwood (2007), administrators in educational organizations must provide a well-equipped learning environment, create an organizational vision accepted by the stakeholders, and offer opportunities to teachers for professional development to increase performance and ensure sustainability. Ailin and Lindgren (2008), emphasized that innovative school leadership is the ability to think innovation as a whole and considering innovation strategically during the management process.

In their study, Hunter and Cushenbery (2011) stated that managers who have innovation management competence also own multiple leadership roles. In addition, while implementing innovation they transform innovation into an organizational purpose by choosing the right leadership model. According to Büllbül (2012), to manage innovations, qualified leaders are required, in other words, the innovative capacity of the educational organization can be measured by the school administrators and administrative staff who are guiding the organizational culture. The innovations and changes that are going to be made in educational organizations and educational programs should be made up of dynamics in education. Therefore, it is important to give essential opportunities to school administrators to gain innovation management competencies. To have a strong influence and voice in the digital age, educational organizations need to develop a structure that adopts change and innovative practices at all levels (Özden, 2013). For teachers, who are the most important driving force of innovation management, to participate in innovation and to benefit; there is a need for an organizational culture in which they are motivated. Rewarding employees for their desire and efforts for innovation is one of the building blocks and source of motivation for creating an innovative organizational culture (Oke, 2007).

According to the European Parliament and the Council of the European Union (2006); lifelong learning has been expressed as "all activities aim to develop the knowledge, skills, and competencies of a person individually, socially or professionally". In their research, De Jesus and Conboy (2001) emphasized that highly motivated teachers have an important role in the implementation process of educational innovations, students' academic success, acquiring positive gains from innovation, and realizing transformation. It can be thought that individuals' ability to maintain their lifelong learning tendencies can be achieved with high motivation. Yuan and Woodman (2010) expressed individual innovativeness as developing, internalizing, or applying an innovation. In other words, it can be described as being open and willing to change. As a necessity of the information age, individual innovativeness means that the individual continues, changes, and renews his/her personal development.

According to Watt (2002), there is an organizational culture that embraces and implements the development of innovation in innovative schools. The

culture of the innovative school also attaches importance to teamwork. In innovative schools, teachers collaborate to come up with new ideas, acquire new knowledge and develop curriculum. The school culture as well as the structure and the progress should support innovative thinking and steps (Pollock, 2008). The adaptation stage of organizational culture at the exact time depends only on the competencies of school administrators who adopt the change as an indispensable part of organizational culture (Çolakoğlu, 2012). Schools; beyond being organizations that teach knowledge to individuals, they should be organizations that instill an awareness of individual learning, support the development of learning skills, and enable the acquired skills to be used lifelong.

Teachers, who have the most important role in the education of individuals should also have lifelong learning competencies and adapt these competencies to the teaching-learning process they plan and be willing to innovate (Kılıç, 2015). In other words, teachers' individual innovativeness and lifelong learning tendencies should be supported by the director of the educational organization by developing an innovative school culture. The requirements created by technology and social change have initiated the innovation process in educational organizations. In the process of renewal and change the competencies of the school administrator play an important role in course outcomes, curriculums, methods, assessment, and evaluation. The path to be followed by the school administrator for the renewal of the organization and the ability to manage change ensure the continuity of the organization as well as respond to the needs of the school environment. In other words, the innovation management competence of the school administrator in the innovation process in educational organizations has great importance (Erdemet, 2017).

The difficulty of closing the ever-widening gap between the knowledge and skills we have acquired throughout our education life can only be covered by the educator's new perspective on the education system and the willingness and responsibility to innovate. Education's ability to meet the learning needs of individuals depends on its timely and effective adaptation to changing and developing conditions. This situation requires different innovative processes and service strategies. For individuals adapting themselves to the changing and developing world and to be successful, education and training programs

should determine their goals in this direction. Schools are a learning ecosystem created by all their stakeholders together because the endless desire to learn can only turn into a lifelong learning journey in this way. For this reason, schools need to invest in lifelong learning and innovative learning models in order to be sustainable. At this point, school administrators should consider change and innovation as an indispensable obligation to survive, rather than a necessity. They should remember that it is one of the basic responsibilities of change and renewal processes. This understanding can only achieve when the school principals acquire innovative leader qualities. In education, there is now a need for innovative leaders who can catch the continuity and speed of change, and teachers who integrate the innovations of the information age and who can transform education into a continuous learning journey to make change and development continuous.

In this context, the aim of this study is to analyze the relationships among innovation management competencies of school administrators, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers and to determine the predictive value of innovation management competencies of school administrators and teachers' lifelong learning tendencies have on teachers' individual innovativeness levels. In line with this main purpose of the research, the following questions were sought:

- Is there a significant relationship among innovation management competencies of school administrators, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers?
- Do the perceived innovation management competencies of school administrators predict teachers' individual innovativeness levels?
- Do the perceived innovation management competencies of school administrators predict teachers' lifelong learning tendencies?
- Do the teachers' lifelong learning tendencies predict their individual innovativeness levels?
- Do the perceived innovation management competencies of school administrators and teachers' lifelong learning tendencies together predict their individual innovativeness levels?

Methodology

Research Model

In this study, the predictive research design, one of the quantitative research correlation survey model types, has been used to analyze the relationships among innovation management competencies of school administrators, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers and to determine the predictive value of innovation management competencies of school administrators and teachers' lifelong learning tendencies have on teachers' individual innovativeness levels. The predictive research model is a preferred research model for "predicting or understanding future behavior" (Creswell, 2017, p. 434) and for determining independent variables that predict the dependent variable.

Population and Sample

The population of the research consists of 1569 teachers working in 38 public schools in Güngören district of Istanbul province in 2018-2019 academic year. The sample of the study consisted of 302 randomly selected teachers. The sample size represents about 19.2% of the population. 215 (80.46%) of the teachers are female and 87 (28,80%) are male; 243 (80.7%) of them have an undergraduate degree and 59 (19.53%) of them have a graduate degree; 124 (41.5) of them have 5 years and under seniority, 89 (29.47%) of them have 6-10 years seniority, 42 (13.9%) of them have 11-15 years seniority and 47 (15.56%) of them have 16 years seniority. 255 of the participants (84.43%) are under 40 years old and 47 (15.56%) are 40 years old and above.

Data Collection Tools

Three different scales have been used to determine the relationships among innovation management competencies of school administrators, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers and have been conducted to determine whether perceived levels of innovation

management competencies of school administrators and teachers' lifelong learning tendencies together predict individual innovativeness levels of teachers. The first part of the data collection tool contains a personal information form. The personal information form consists of questions to determine the gender, professional seniority, and educational status of the participants. In the second part of the data collection tool, "Innovation Management Scale in Schools", "Individual Innovativeness Scale" and "Lifelong Learning Tendency Scale" have been used to obtain data.

Innovation Management Scale in Schools: The Innovation Management Scale in Schools, which is used to measure the innovation management competencies of the administrators, was developed by Bülbül (2012a). The scale consists of 4 sub-dimensions (project management, organizational culture and structure, innovation strategy and input management) and 32 items. The items in the scale are rated as 5-point Likert-type scale "1-Strongly Disagree", "2- Disagree", "3-Neutral", "4-Agree", "5-Strongly Agree". There is no item on the scale that is reversed. In this study, Cronbach Alpha reliability coefficient of the scale was calculated as a =.932.

Individual Innovativeness Scale: The Individual Innovativeness Scale, was developed by Hurt, Joseph and Cook (1977) and adapted to Turkish by Kılıçer and Odabaşı (2010). The Individual Innovativeness Scale consists of 4 sub-dimensions (resistance to change, opinion leadership, openness to experience and risk taking) and 20 items. In the sub-dimension of resistance to change, all items are negative, items in other dimensions are positive items. The scale is rated as Likert with five points: "Strongly Agree", "Agree", "Neutral"," Agree", and "Strongly Disagree 12 items of the scale are positive (1, 2, 3, 5, 8, 9, 11, 12, 14, 16, 18 and 19) and 8 of them are negative (4, 6, 7, 10, 13, 15, 17 and 20). In this study, Cronbach Alpha reliability coefficient of the scale was calculated as a =.816.

Lifelong Learning Tendency Scale: Lifelong Learning Tendency Scale was developed by Yelkin Diker Coşkun (2009) and it was used to determine lifelong learning tendencies. Lifelong learning tendency scale consists of two sub-dimensions two positive and two negative - and 27 items. Positive items are in the dimensions of "motivation in lifelong learning" (items 1, 2, 3, 4, 5, 6) and "persistence" (items 7, 8, 9, 10, 11,12), while negative items are in "deprivation of regulating learning" (items 13, 14, 15, 16, 17, 18) and

"curiosity deprivation" (items 19, 20, 21, 22, 23, 24, 25, 26, 27). The responses to the scale are six-point Likert-type ratings such as "Very Fits", "Partly Fits", "Fits Very Little", "Does Not Fit A Little", "Partly Does Not Fit", "Never Fits". In this study, Cronbach Alpha reliability coefficient of the scale was calculated as a =.896.

Analysis of the Data

The data collected within the scope of the study have been analyzed using the SPSS program. The study has used correlation analysis for calculating the relationships among the variables. Simple and multiple regression analyses have been used to determine the predictive value of innovation management competencies of school administrators with teachers' lifelong learning tendencies have on individual innovativeness levels of teachers.

To compute the effect size of the predictive level (r^2) obtained from the multiple regression analysis, the f^2 value [$f^2=R^2/(1-R^2)$] has been calculated (Cohen, 1988). Effect size gives information about the rate of change of independent variables on dependent variables. In other words, it provides information about the power of independent variables to explain the change in dependent variables (Özçomak and Çebi, 2017).

Findings

The results of the correlation analysis conducted to determine the relationships between the innovation management competencies of school administrators, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers are given in Table 1.

Table 1. *Correlation analysis*

Variables		Innovation Management Competencies	Lifelong Learning Tendencies	Individual Innovativeness
Innovation Management Competencies	r	1		
	p			
	n	302		
Lifelong Learning Tendencies	r	.194**	1	
	p	.001		
	n	302	302	
Individual Innovativeness	r	.237**	.414**	1
	p	.000	.000	
	n	302	302	302

*p<.05, **p<.01

According to the correlation analysis given in Table 1, it is seen that there is a positive and low-level relationship between perceived innovation management competencies of administrators and teachers' lifelong learning tendencies (r=.194; p<.01); there is a positive and low-level relationship between perceived innovation management competencies of administrators and the individual innovativeness levels of the teachers (r=.237; p<.01); there is a positive and moderate significant relationship is found among lifelong learning tendencies of teachers and their individual innovativeness levels (r=.414; p<.01).

Table 2 shows the results of the simple regression analysis to determine whether teachers' lifelong learning tendencies predict their individual innovativeness levels.

Table 2. *The results of simple regression analysis of teachers' lifelong learning tendencies predicted their individual innovativeness levels.*

Independent variable	Dependent Variable	B	Std. Error	(β)	t	*p*	R	R^2	F	*p*
Constant	Individual Innovativeness	1,316	.120		10.989	.000	.414	.171	62,023	. 000
Lifelong Learning		.486	.062	.414	7,875	.000				

When Table 2 is examined, teachers' perception of lifelong learning significantly predicts their individual innovativeness levels (p<.05). Teachers' lifelong learning perception predicts 17% of their individual innovativeness levels (r=.414; r^2=.17). In other words, teachers' perceptions of lifelong learning are explained by 17% of the total variance in the individual innovativeness levels of the teachers.

Table 3 shows the results of the simple regression analysis on conducted to determine whether the perceived innovation management competencies of school administrators predict their individual innovativeness levels.

Table 3. *The results* of *simple regression analysis of the perceived innovation management competencies of school administrators predicted their individual innovativeness levels.*

Independent Variable	Dependent Variable	B	Std. Error	(β)	t	*p*	R	R^2	F	*p*
Constant	Individual Innovativeness	1,743	.120		14.502	.000	.237	.056	17,845	.000
Innovation Management Competencies of Managers		.157	.037	.237	4,224	.000				

When Table 3 is examined, school administrators' perceived innovation management competencies significantly predict teachers' individual innovativeness levels ($p<.05$). The perceived innovation management competencies of school administrators predict 5% of teachers' individual innovativeness ($r=.237$; $r^2=.056$). In other words, school administrators perceived innovation management competencies are explained by 5% of the total variance in the individual innovativeness levels of teachers.

Table 4 shows the results of simple regression analysis to determine whether school administrators' perceived innovation management competencies predict teachers' lifelong learning levels.

Table 4. *The results of simple regression analysis of school administrators' perceived innovation management competencies predict teachers' lifelong learning levels.*

Independent Variable	Dependent Variable	B	Std. Error	(β)	t	*p*	R	R^2	F	*p*
Constant	Lifelong Learning	1,553	.103		15.026	.000	.194	.038	11,781	.000
Innovation Management Competencies of Administrators		.110	.032	.194	3,432	.000				

When Table 4 is examined, the perceived innovation management competencies of school administrators significantly predict teachers' lifelong learning levels ($p<.05$). The perceived innovation management competencies of school administrators predict 3% of teachers' lifelong learning levels ($r=.1944$; $r^2=.038$). In other words, the perceived innovation management competencies of school administrators explained by approximately 4% of the total varience in lifelong learning levels.

Table 5 shows the results of multiple regression analysis to determine whether perceived school administrators' innovation management competencies and teachers' perceptions of lifelong learning together predict their individual innovativeness levels.

Table 5. *The results of multiple regression analysis of perceived school administrators' innovation management competencies and teachers' perceptions of lifelong learning together predict their individual innovativeness levels.*

Independent Variable	Dependent Variable	B	Std. Error	(β)	t	*p*	R	R^2	F	*p*
Constant	Individual Innovativeness	1.046	.147		7.113	.000	.444	.197	36.624	.000
Innovation Management Competencies of Administrators		.449	.062	.382	7.235	.016				
Lifelong Learning		.108	.035	.163	3.078	.032				

As it can be seen in Table 5, school administrators' perceived innovation management competencies and teachers' perceptions of lifelong learning together predict their individual innovativeness levels in a meaningful way ($p<.05$). This rate is 19%. In other words, approximately 20% of the total variance in individual innovativeness levels of teachers is explained by perceived innovation management competencies of school administrators and lifelong learning tendencies of teachers. The f^2 value was used to calculate the effect size on the individual innovation levels of teachers, together with the innovation management competencies of school administrators and the lifelong learning tendencies of teachers. In the calculation of f2 value, the formula $f^2 = R^2 / (1-R^2)$ suggested by Cohen (1988) was used. The effect size of the f^2 value obtained was evaluated according to the criteria ".02≤ f^2 <.15 low effect; .15≤ f^2 <.35 medium effect; .35≤ f^2 large effect" (Cohen, 1988). Together with the innovation management competencies of school administrators and the lifelong learning tendencies of teachers, the effect size on teachers' individual innovation levels was found to be $f^2 = .197 / (1-.197) =. 154$. This effect size was found to be at the "medium" level.

Discussion, Conclusion and Suggestions

The aim of this study is to analyze the relationships among innovation management competencies of school administrators, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers and to determine the predictive value of innovation management competencies of school administrators with teachers' lifelong learning tendencies have on

individual innovativeness levels of teachers. According to the results of the research significant relationships were determined among school administrators' innovation management competencies, teachers' lifelong learning tendencies, and individual innovativeness levels of teachers.

According to the findings of the research, there is a positive and low level relationship among the perceived innovation management competencies of school administrators and teachers' lifelong learning tendencies; besides there is a positive and low level relationship between the perceived innovation management competencies of school administrators and teachers' individual innovativeness levels; there is a positive and moderately significant relationship among teachers' lifelong learning tendencies and their level of individual innovativeness. This situation can be interpreted as the innovation model approach and process management competence to be drawn by the school leader has a positive and supportive effect on teachers. In this context, it can be said that administrators 'interaction with teachers and their attitudes in innovation management can increase teachers' desire for innovation and accordingly, innovation can be achieved successfully. In other words, administrators who master innovation management can enable teachers to develop positive feelings, behaviors, and thoughts about innovation, and these positive elements can support the academic success of the school. When this result is compared with the results in the literature, it is seen that there are similarities.

In their study, Žnidaršič and Jereb (2011) found a positive relationship between investments in lifelong learning and innovation and the innovativeness levels of societies. In their study, Yılmaz and Beşkaya (2018) indicated that, the higher innovation management competencies and lifelong learning tendencies of school administrators have, the more innovations can be applied in schools. Besides, there would be more opportunities for teachers to develop themselves personally and professionally. In this sense, it can be said that when school administrators manage and develop innovations, teachers are open to innovations and develop their lifelong learning desire positively.

According to another finding obtained from the research, was that teachers' lifelong learning tendencies predicted their individual innovativeness levels

significantly. In other words, it can be stated that teachers' lifelong learning tendencies have a positive effect on their individual innovativeness levels. This situation can be interpreted as teachers' perception of lifelong learning is a factor that increases their individual innovativeness levels. Specifically, teachers with a high level of lifelong learning tendency can develop positive emotions, behaviors and thoughts about innovations, and these positive elements can support teachers to be successful in innovation practices and to increase academic success. When this result is compared with the literature, many studies support the results. Kılıç (2015) emphasized in his study that teachers 'lifelong learning tendencies predict their individual innovativeness levels in the context of sub-dimensions. In their study Yılmaz and Beşkaya (2018) concluded a result that there is a positive, moderate and significant relationship between education administrators' lifelong learning tendencies and individual innovativeness levels.

Besides,Yenice and Tunç (2019) stated that sub-dimension scores obtained from the lifelong learning tendency and individual innovativeness sclaes indicates a meaningful relationship between the pre-service teachers' lifelong learning tendencies and their individual innovativeness levels and another result from the study mentioned that teachers whose motivation for lifelong learning increase, at the same time their individual innovativeness levels increase too.In the literature, within the scope of the studies conducted to determine the lifelong learning tendencies of teachers (Ayra, 2015; Dündar, 2016; Kılıç ve Ayvaz Tuncel, 2014; Özçiftçi, 2014) it was found that teachers' lifelong learning tendencies are quite high. Considering that teachers are individuals who guide and shape society at the same time, it is important that teachers must have high level of lifelong learning tendencies (Yılmaz, 2016).

Another result obtained from the study was that perceived innovation management competencies of school administrators predicted the individual innovativeness levels of teachers. In other words, teachers 'individual innovativeness levels are explained by perceived school administrators' innovation management competencies. In this context, it can be said that administrators 'interaction with teachers and their mastery of innovation management increase teachers' individual innovativeness levels and consequently have a positive effect on their adoption of innovation. In other words, school administrators who use innovative management practices in the

right way and have innovative management features can support teachers to develop positive behaviors and thoughts against innovations. Innovative school administrators who are qualified, better at reading the continuously renewed and changing new world and transform the resistance against change within the organization into a structure that feeds on innovation; can be interpreted as having a positive effect on teachers to be open to innovation.

The result obtained from this study is consistent with the literature and supports that school administrators 'innovation management competencies are predictors of teachers' individual innovation levels. Many studies reveal the importance of having an innovative organizational culture and structure to achieve success in innovation management (Bülbül and Göl,2012b). Pihie, Bagheri, and Asimiran (2014) evaluated school administrators' entrepreneurial leadership attitudes and innovative behaviors perceived by teachers in their research. According to their research results, there was a significant correlation between the frequency of principals ' entrepreneurial leadership practices and school innovation. Based on the results of the research, it is to express that the innovative approach model of the teachers in the school depends on the management skills and competencies of the school principals.

As Watt (2002) pointed out, there are four dimensions of innovation in educational organizations. These are innovative individuals, culture and climate, structures and processes, and leadership. In other words, school leaders described as; who know the necessity and importance of innovation to make the necessary change, keep contact with school staff, students and parents, ensure the efficient use of school resources throughout the renewal process, and encourage school stakeholders to innovate. Therefore, to implement innovations in educational organizations, administrators and teachers should share a common philosophy of innovation management.

In the study conducted by Lin, Su, and Higgins (2016), it was stated that innovation management should be used effectively to maintain an effective and dynamic management approach and it is emphasized that executive behaviors have a direct effect on this process. In another study conducted by Manea (2015), it was shown that the innovation management competencies of school administrators positively affect teachers' performance. It can be said

that teachers who are guided, supported, and encouraged by innovative managers perform better in the educational organizations they work for. According to another result of the study, the innovation management competencies of school administrators perceived by teachers affect the lifelong learning tendencies of teachers. By way of explanation, teachers 'lifelong learning levels are explained by school administrators' perceived innovation management competencies.

According to another result of the study, perceived innovation management competencies of school administrators predicted teachers' lifelong learning tendencies. This situation can be interpreted as school administrators 'innovation management competencies are a factor that increases teachers' perceptions of lifelong learning. In this context, it can be said that school administrators who have innovative attitudes and behaviors that provide organizational change and innovation in innovation management also affect positively teachers' motivation for innovation. This result is consistent with other research results in the literature. It was determined that as the innovation management perceptions of teachers increased, their lifelong learning tendencies (Ergin & Karataş, 2018; Karaman & Aydoğmuş, 2018; Tuijnman & Boström) and motivation for success also increased (Ekşi, Özgenel & Metlilo, 2020). When this result is compared with the literature, a study conducted by Ayaz and Ünal (2016), it was concluded that as teachers' perception of innovation management rises, their lifelong learning tendency levels also increase. In another study conducted by Altın (2018), it was emphasized that teachers were willing to make an effort to develop themselves individually and professionally, and they were willing to create opportunities to learn and acquire new knowledge and skills continuously. It can be said that teachers working with managers who have innovation management competence have a higher desire to learn in the context of lifelong learning.

Finally, according to results obtained from the study, perceived innovation management competencies of school administrators and teachers' perceptions of lifelong learning tendencies together predicted individual innovativeness levels of teachers. This situation can be interpreted as teachers' perceptions of innovation management and lifelong learning tendencies are the factors that increase their individual innovativeness levels. In other words, teachers who work together with managers who have innovation management competencies

and who have high lifelong learning tendencies can develop positive feelings, thoughts, and behaviors towards innovations.

When school administrators take the lead in implementing innovations, the individual innovativeness skills of teachers with a high perception of lifelong learning also increase. Within the framework of the results obtained it can be said that school administrators' having innovation management competence positively affects teachers in terms of innovation and the meaning they attribute to this concept. Innovative school administrators can be interpreted as the facilitator who enable teachers to see themselves as a part of innovation. Innovativeness motivation, which is one of the managerial features, is significantly effective in context. Teachers' adoption and positive attitudes in practicing innovations can be considered as important factors that empower change and innovations to achieve their goals. This is consistent with other research results in the literature.

In their study, Çuhadar, Bülbül and Ilgaz (2013) showed that teachers showed a state of enthusiasm in terms of finding and experiencing innovation. In addition, it was found that as the innovation management competencies of school administrators and teachers' lifelong learning tendencies increased their individual innovativeness levels increased too (Rogers, 1995). While the friendly and collaborative school climate positively affects teachers' opinion on leadership and openness to experience, the imperative school principal supports the resistance to change (Özgenel, Mert & Özgenel, 2020).

As Bülbül (2012b) points out, in order to complete the innovation process successfully in educational organizations, a school culture with innovative thinking skills, creativity, and teamwork is needed. As Watt (2002) states, change is not something that can happen suddenly. To develop innovation and change in educational organizations; it is necessary to have an organizational culture and environment aimed at acting and thinking innovatively. It is the school administrator who will provide an innovative organizational culture.

Schools that prepare digital-age learners should establish collaborative environments in the schools to create a school system suitable for future adults. Thus, regeneration can be realized efficiently. In addition, the renewed school also obliges the teacher to renew himself / herself. In this context, supporting teachers in the innovation process and contributing to their

professional development should not be ignored. The elements that are effective in ensuring continuity in the innovation process and the stakeholders' active participation can create a cumulative learning experience and environment. The ability of education to meet the learning needs of individuals depends on timely and effective adaptation of changing and developing conditions. This requires different innovative processes and service strategies. In education there is now a need for innovative leaders who can capture the continuity and speed of change, and teachers who integrate with the innovations of the information age and who can transform education into a continuous learning journey to sustain change and development. This research sheds light on the researchers who want to work in creating an innovative organizational culture in the process of innovation management in schools, encouraging innovation and adopting an understanding of innovation. Also, some suggestions were made in line with the results stated in the research.

- Educators, who are the most important actors in building a digital information age society, must have 21st century skills such as lifelong learning tendency and innovativeness in order to transform education. Therefore, policy makers need to organize various professional and personal development programs in the fields of innovation management, lifelong learning and innovation.
- Projects that enable educators to develop new ideas should be developed, and the necessary support should be given to implement these projects.
- Scientific studies can be carried out to support the professional development of school administrators by conducting research on the leadership characteristics and innovation management competencies of school administrators.
- By conducting quantitative and qualitative studies on the innovation implementation competence of schools, models that support the strengths of schools and organizational culture can be developed while creating a culture based on innovation in schools.
- School administrators who are in the process of innovation can include teachers in the roadmap and get their ideas and opinions.
- Private project teams can be formed in schools to make changes and innovations that will add value to the development of the country.

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