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The Effect of Knowledge-Based Leadership on The Innovative Educational Activities of Teachers with The Mediating Role of Making Schools Smart

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Abstract

The present study was conducted to investigate the effect of Knowledge-based Leadership on the innovative educational activities of first-secondary teachers in Durood City with the role of mediator in Making Schools Smart Plan.

This study is applied in terms of purpose and descriptive-correlational in terms of data collection method and structural equation modeling. The statistical population includes all the teachers of secondary schools of Dorud City and 135 of them were selected as a sample by stratified random sampling method. Data collection was done with Donit and DePablo's (2015) Knowledge-based Leadership questionnaires, Saatchi, Kamkari, and Askarian's (2010) innovative educational activities questionnaire, and Smartening Schools scale Jafari Hajti's (2015). Average Variance Extracted, Cronbach's alpha coefficient, and composite reliability (CR) were used to measure the validity and reliability of the tools, and the results of all the indices confirmed that the questionnaires have a suitable and acceptable condition. The final analysis of the data using SPSS software and Smart PLS was done.

According to the standard coefficients of the path, the direct effect of knowledge-based leadership on innovative educational activities is 0.532; The amount of indirect effect is 0.270 and its overall effect is equal to 0.802. Also, the smartness of schools directly explains innovative educational activities by 0.428 (42.8%). Knowledge-based leadership is one of the effective leadership styles to strengthen innovative activities in organizations especially in schools. Smartening schools by strengthening learning-teaching processes and creating an interactive environment can facilitate innovative educational activities.

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Introduction

Operating in an environment with features such as complexity, uncertainty, ever-increasing changes and rapid developments in information and communication technology on the one hand, and generational change, society's needs and expectations on the other hand, organizations have faced the challenge of adapting to the environment and, as a result, permanence of organizations need new ideas and innovative ideas to survive. New thoughts and opinions, like a soul, are blown into the body of the organization and save it from destruction (Rezai Nasab & Dehghan Dehnavi, 2016).

The creation of new ideas and processes is a path through which organizations can adapt themselves to the environment and gain a competitive advantage by developing innovative behaviors and activities (Akram et al., 2020). Innovation can be defined as the process of creating new, constructive and successful changes that open a window of new opportunities to the organization; Therefore, organizations try to overcome existing limitations and improve their performance by focusing on innovative activities (Lin, Shyu, & Ding, 2017).

The education system on the one hand, by helping to form the foundation of personality and creative attitude of people, and on the other hand, due to its role and influence on different levels and sectors of society, it is the starting point of creating and nurturing an innovative spirit in societies (Khosravi & Arman, 2015). In this regard, educational organizations, especially schools, must continuously adapt to new conditions in order to continue their existence and effectiveness, and this requires innovation in educational activities (Pazki & Afzalkhani, 2015).

Innovative educational activities do not necessarily mean new things; Rather, it means the creative use of positive and good activities - whether old or new - in order to respond to the changes, expectations and especially the technological advances of the graduates. In other words, educational innovation is a process that leads to an increase in the quality and results of the learning process (Mirkamali, Pourkarimi & Hajari, 2014).

Eisner (2005) believes that innovative educational activities are a multidimensional concept and include curriculum, policies and goals, structure, how to implement education and evaluation methods. He has a systemic approach to innovation; This means that while each dimension should be changed correctly, in the end, its change and transformation should be in line with other dimensions in order to lead to the coherence and integrity of the whole system and reduce possible challenges. According to this theory, in every educational innovation, educational policies and curriculum goals should be modified and redefined in accordance with the expected innovations; Then the mission, vision and mission of the schools should be changed according to it, and in the next step, the facilities and physical facilities, the administrative structure and the laws governing the schools should be reviewed and equipped according to the goals of the curriculum in order to

provide the necessary platform for the effective implementation of the content and learning activities for Provide students and teachers participation.

Now, it can be understood that in order to create and promote the innovative educational activities at individual, group and organizational levels, it is required some various facilitators such as attention to the irreplaceable role of principals and their administrative skills and familiarity with new leadership styles are undeniable. As Robbins (1998) said, principals have an important role in creating an innovation and creativity environment, that is, the platforms for creating an innovation environment by principals depend on several factors, the most important of which are different horizontal organizational structures with a network, fewer regulations, flexibility, informal and fast communication between units, such structures are more receptive to innovation.

Therefore, the role of organizations and managers with managerial skills and familiar with new leadership styles is irreplaceable in providing the necessary conditions for the flourishing of innovative educational activities at individual, group and organizational levels. One of the innovative leadership styles, especially in educational organizations, is the Knowledge-based Leadership style, which, by implementing it, can help create innovation in the organization and gain a competitive advantage.(Wallapa, Saowanee &Tang, 2015). It is aimed at creating value for the organization (Zapp, 2020).

Knowledge-based Leadership is a social process during which leaders in the field of knowledge sharing facilitate the storage and transfer of knowledge and support organization members to achieve group and organizational goals (Zarei, Pourshafi & Asgari, 2022).

In some resent studies, Knowledge-based Leadership is one of the important issues in the field of strategic management of organizations, which is tied to the ability to innovate and the ability of employees to use organizational knowledge resources (Wang, Gong-Li Luob & Saric, 2020). Based on this finding, organizational strategic factors and Knowledge-based Leadership are considered a suitable tool for improving the innovative performance of employees and the organization. This relationship has been confirmed by numerous studies such as (Fathi, Ameri & Ghaderzade, 2015; Rahimi, 2017; Gholampour, Alikhan & Gorgani, 2017; Mario, Bartol & Srivastava, 2018; Naqshbandi & Jasimuddin, 2018; Oliva & Kotabe, 2019; Jesemanni, 2020; Zia, 2020; Mahmoudi, Salehi, 2021; Rajabi Farjad, Mirspasi & Naderi, 2021; Chaithanapat et al., 2022).

In this regard, Donate & de Pablo, (2015) considered Knowledge-based Leadership as a basic condition and one of the successful strategic methods for developing and encouraging knowledge management activities in order to achieve innovation goals in knowledge organizations such as educational organizations. In educational organizations, Knowledge-based Leadership is one of the most important success factors in competitive

conditions and the information age. Today, a number of educational organizations measure their knowledge and reflect it as the organization's intellectual capital as well as an index for ranking organizations in their reports.

Today's principals, must provide an environment for the growth of educational atmosphere in all fields by playing the role of Knowledge-based Leadership. .(Qelich Lee, Ezzati & Rahmati, 2019)ر and new technologies to students should be able to institutionalize Knowledge-based Leadership in the organization (Kaya, 2020).

In general, it can be understood that nowadays the most important concern of the education system of countries is to create a suitable environment for the promotion of intellectual capital in the information and knowledge-based society. In order to promoting effective participation of all social groups in a such society, they must acquire continuous learning skills, initiative efforts, innovation, and spontaneous and active social participation. To this end it is necessary to first, present a new definition of the role and function of schools as the main educational institution in the society, and second, provides the possibility of continuous learning and special opportunities for students and teachers to gain new and valuable experiences in the information society. The technology is applied not only as a tool, but also in the format of empowerment should be considered for professional education and training (Rajba Alipour, Shirpour Bonab & Shirpour, 2012).

In other words, it can be stated that policy-makers and education planners have well understood that the traditional education system is no longer able to meet the needs and challenges of today's dynamic and changing society, so it is necessary to review the traditional education policies and methods and use modern educational approaches. It is no doubt that it may lead to more interaction in the teaching-learning process (Sivagami & Samundeeswari, 2015).

With the knowledge of these issues, a global movement has been formed in developed and developing countries to change the educational structure, simultaneously with the transition from traditional societies to knowledge-based societies. In Iran, education policy makers have understood the need for change in the country's education system and addressed it in the upper documents and guidelines approved by the Ministry of Education. They are well aware of the role of infrastructure in the formation of a knowledge-oriented society at the school level, and they try to help its realization by providing the necessary facilities. One of the strategies they are interested in is the smartening of educational spaces with the title of smart schools (Rabiei Waziri, 2015) and paying attention to the design of smart schools as the most suitable model for the development of information and communication technology in the fundamental transformation of education (Yazdani, 2019).

According to the definition of "Smart Schools Strategic Document", (2009) a smart school is a school in which the process of implementing all processes

including administration, supervision, control, teaching- learning process, educational resources, evaluation of documents and office affairs, communication and the basics of their development are designed based on information and communication technology for improving the educational and training system.

according "Road Map of Smart Schools", smart school is one of the key requirements of knowledge societies and follows the approaches of developing knowledge skills and entrepreneurship of students. In these schools, enhanced learning-teaching processes and an interactive environment are provided to improve students' key skills in the knowledge-based era (Road Map of Smart Schools, 2011).

also a smart school means a physical school whose control and management is based on computer and network technology, and the content of its courses is electronic and its monitoring and evaluation system is intelligent (Al-Badi, Tarhini & Al-Mawali, 2020).

Based on the aforementioned Strategic Document of Smart Schools, (2009) include some components such as: goals, the role of teachers, the role of students, methods of presenting courses, and materials and human facilities as the basic components of making schools smarting. These components will be discussed below:

a) The goals of smarting are:

(1) the continuing of the learning process of students outside the school

(2) the formation of a dynamic and attractive environment for the full flurish of talents and the emergence of individual and collective creativity of students

(3) increasing the level of support and participation of parents and other interested groups in the learning process of students

(4) coordination of school teachers with new educational trends based on the requirements of the knowledge-based society

(5) formation of a suitable platform for conducting continuous evaluations and appropriate to the talent and progress of students

(6) creating the environment of participation, interaction and mutual thinking of students and teachers in the teaching and learning processes

(7) The development of research-oriented and student-oriented culture in educational processes

(8) The development of verbal, social, professional and specialized cognitive skills of students

b) The role of teachers: Teachers also learn along with students and instead of providing one-sided teaching and learning, they play the role of facilitator in students' self-learning.

c) The role of students: Also, due to the student-based of the smarting school, the student in these schools has a special role in determining the educational goals of the student with the guidance of his teacher. In determining the educational tasks, the tasks are determined by the student at the suggestion of the teacher. In choosing teaching resources, the students consider own resources and asks the teacher for opinion about them.

D) Content presentation methods: Regarding the content presentation methods, in order to make schools smarter, technology will replace the book-centered approach, and teachers

will teach the content well with new technologies such as PowerPoint slides, spreadsheets, and internet equipment.

E) Material and human facilities: These facilities in smarting schools include the number of computers in the classrooms, educational software, internet, projectors, etc. Also, human facilities also mean the number of employees and specialists familiar with information technology in schools.

Paying attention to the issue of making schools smarter in the upstream documents has encouraged researchers to analyze the issues in this field .for example Ghaznavi et al. (2019) also stated by studying the curriculum of the successful countries of getting Smart plan that the ideal model of the curriculum based on plan of smartening of schools in Iran includes five factors of management system, teaching and learning environment, human resource empowerment, hardware factors and software factors.

Saraji and Soleimani (2016) in the analysis of the obstacles to the smartening of schools, reached factors such as weak knowledge, skill and attitude of teachers, lack of technical support, lack of proper interaction between parents and school, and school management issues.

Hosseini, Ati, and Shokohi Fard (2013) analyzed the necessity of using knowledge management system in smart schools. They stated that one of the successful strategies in smart schools is the attention and use of knowledge management in schools; This is because today the most important assets of an organization are its intelligent and knowledgeable employees who lead the organization to a sustainable competitive advantage by creating new organizational processes, new technologies and developing new services. The innovative effort in the organization is the result of investing in the learning process and improving human resource management and knowledge management. The education and training organization can create the possibility for the employees to rely on their experiences in the organizational issues that need new solutions with the creative management of knowledge and the innovative application of information technology and help the education and training by growing in the learning path.

In recent research, Zainabadi, & Mohammadvand (2016) pointed out the prominent role of management in smart schools. They considered the management of smart schools as the leadership of school technology, which is supposed to provide the context for the correct, continuous and optimal use of technology in the school with appropriate actions.

Garcia-Alvarez, (2015) discussed the effects of information and communication technology on knowledge management and innovation. The results of this research showed that the penetration of information and communication technology has a positive effect on a variety of potential innovations such as the development of new products and the re-engineering of business processes. achieve sustainable competitiveness.

The study of Arvanitis, Loukis & Diamantopoulou (2013) also confirms

the impact of information and communication technology on innovative performance. In this regard, Moghadam (2014) studied the comparison of the role of school smartness on the academic motivation, creativity and innovation of second year high school students in Khorramabad city in smart and non-smart schools. The results showed that there is a significant difference between the academic motivation, creativity and innovation of smart school students and non-smart school students. In this way, the internal academic motivation of smart school students is higher compared to normal school students, but on the contrary, the external academic motivation of non-smart school students is at a higher level compared to smart school students, as well as the creativity and innovation of smart school students compared to normal school students is higher.

Furthermore, the study of Dartaj, Lakpour and Bahlouli (2013) on the impact of smart schools in Lorestan province on the academic progress of secondary school students showed that students who use new technologies in smart schools they use it, they have the power to stimulate the growth of intellectual skills such as reasoning and problem-solving ability, learning techniques and innovation and creativity, also smart schools have a positive effect on the educational progress of students. In these schools, learning is more coherent and realistic, the spirit of research, the range of attention of different intellectual skills and cooperation among students is more.

A reflection on what has been said shows that that schools, like other organizations, are increasingly facing changing and turbulent environments, therefore, in order to survive and dynamism, they have to adapt themselves to environmental changes, and in the meantime, they have to use the old methods. Revise teaching - learning and think about improving the level of innovation in educational activities in a knowledge-oriented environment by taking advantage of knowledge leadership. Additionally, paying attention to the necessity of smarting schools in the upstream documents of education has caused researchers to analyze the challenges on the way of implementing and discuss its effects on the performance and innovation of schools, teachers and students. As Heydarifard, Zeineabadi and Behrangi (2015) pointed out, one of the basic challenges of the country's education system is the lack of attention to innovation in the education system and educational activities. The low number of in-service courses with the theme of innovative educational activities for teachers in the system of in-service education for educators, the low reception and participation of teachers in the festival of innovation in the education process, as well as the lived experience of the researcher indicate that Innovation in educational activities does not have an acceptable level.

Considering the effectiveness of the Knowledge-based Leadership style on the one hand and the role of technological facilities and intelligence on the other hand on the innovative

educational activities that were revealed in the reviewed texts, this research seeks to determine the effectiveness of each of the mentioned variables on the innovative educational activities among the teachers of the secondary Schools of Durood city (Fig. 1).

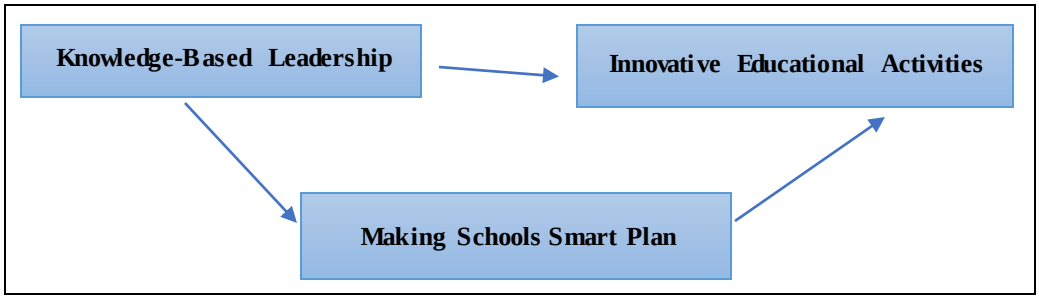

Figure 1. Conceptual Model Of The Research

Research Hypotheses

H. 1. Knowledge-based Leadership has an effect on innovative educational activities.

H. 2. Scientific leadership has an effect on making schools smart plan.

H.3. Making schools smart plan has an impact on innovative educational activities.

H.4. Knowledge-based Leadership has an effect on innovative educational activities through the mediation of making schools smart plan.

Research Method

Approach and Strategy:

The current research is practical in terms of the purpose, and in terms of the data collection method, this is a descriptive study of the correlation type, through structural equation modeling.

Sampling

The statistical population of the research includes all teachers of the first secondary level of Durood city, that of which 135 of teachers were selected as a sample based on the Krejcie & Morgan (1970) table with stratified random sampling method (Table 1)

Tools:

In this research, three questionnaires were used as follows:

1. Knowledge-based Leadership Questionnaire (Donit & DePablo, 2015)
2. Smart Schools Questionnaire (Jafari & Hajati, 2010)
3. Innovative Educational Activities Scale (Saatchi, Kamkari & Asgarian's, 2013).

It should be mentioned that all above questionnaires were adjusted based on a 5-point Likert scale, and they were distributed among the members of the research community. Cronbach's alpha, composite reliability and convergent validity indices were also used to measure the reliability of the variables. The acceptable limit for alpha index is at least 0.7 (Habibpour Getabi & Safari Shali, 2009). The composite reliability index is superior to alpha; Because Cronbach's alpha index is based on the assumption that the variables of the measurement model have the same weights and equal relative importance, but this assumption does not exist in the composite reliability index, and in fact, factor loadings of the items are used to

calculate the composite reliability. For this reason, composite reliability values are higher and better than Cronbach's alpha. The acceptable value of this index is 0.7 to check the internal consistency of the measurement model. In order to determine the validity of the questionnaires, face validity was used with reference to the opinions of professors and experts. Also, in order to measure convergent validity, the extracted average variance index was used, this index shows the degree of correlation of a structure with its indicators. A minimum value of 0.5 is considered for this index. This means that the desired hidden variable explains at least 50% of the variance of its observables (Mohsenin & Esfidani, 2014). Examining Cronbach's alpha values and composite reliability value and convergent validity (AVE) of all three questionnaires with the help of SmartPLS3 software indicates that all the reported values were within the standard range, which indicates appropriate internal reliability and convergent validity of validity and appropriate internal consistency of the research constructs (Table 1).

Table 1. Psychometric Indicators of Data Collection Tools

Variables	N. of items	Cronbach's alpha	Composite reliability (CR)	Convergent Validity (AVE)
Knowledge-based Leadership Questionnaire	6	.89	.91	.64
Innovative Educational Activities Scale	34	.96	.96	.55
Smart Schools Questionnaire	30	.96	.97	.52

The final analysis of the data was done with the help of SPSS and SmartPLS3 software. Structural equation modeling was used to test the hypotheses The statistical methods in this field are the partial least squares method, SmartPLS3 software was used in this research, which is a widely used and useful software in the field of modeling structural equations based on the partial least squares method.

Research Findings

The analysis of demographic information showed that 94 (69.6%) of the respondents were women and 41 (30.4%) of the respondents were men. In terms of educational qualifications, 78 people (57.8%) have a bachelor's degree, 51 people (37.8%) have a master's degree, 3 people (2.2%) have an associate's degree, and 3 people (2.2%) also They had a doctorate degree.

In terms of work experience, 39 people (28.88 percent) have an experience between 24-29 years, 33 people (24.44 %) have an experience between 18-23 years, 23 people (17.03 percent) have an experience between 12-17 years. 19 people (14.07%) had an experience of 1-5 years, 12 people (8.89%) had an experience of 6-11 years, and 9 people (6.69%) had an

experience of more than 29 years. (Table 2).

The analysis of the descriptive indices of the research variables showed that the average of the variables of knowledge-based leadership, innovative educational activities, and making schools smart plan are 3.24, 3.16, and 3.28, respectively (Table 3).

Table 2: Demographic Characteristics of The Research Sample

Frequency	Field of Study	Frequency	Years of service	Frequency	degree of education	Frequency	genus
25.9 %	Humanities	14.07 %	1-5 years	2.2%	Associate 's degree	30.4%	Men
27.4 %	Technical sciences	8.89 %	6-11 years	57.8%	Bachelor's degree	69.6%	Female
26.7 %	Basic science	17.03 %	12-17 years	37.8%	Master's degree	-	-
20 %	Other fields	24.44 %	18-23years	2.2%	Doctorate degree	-	-
-	-	28.88 %	24-29years	-	-	-	-
-	-	6.69 %	Morethan29 years	-	-	-	-
100%	Total	100%	Total	100%	Total	100%	Total

Table 3: Descriptive Statistics of Research Variables

Variables	M	SD	lowest score	highest score
Knowledge-based Leadership	3.24	.83	1.5	5
Innovative Educational Activities	3.16	.76	1.13	5
Schools Smart Plan	3.28	.72	1.5	5

Examining The Structural Model and Testing the Research Hypotheses

As mentioned in the present study, Smart PLS software was used to test the model. After ensuring the internal reliability, composite reliability and convergent validity of the research constructs (Table 1) and factor loadings higher than 0.4 of all the items (Fig. 2), analysis and hypothesis testing was done.

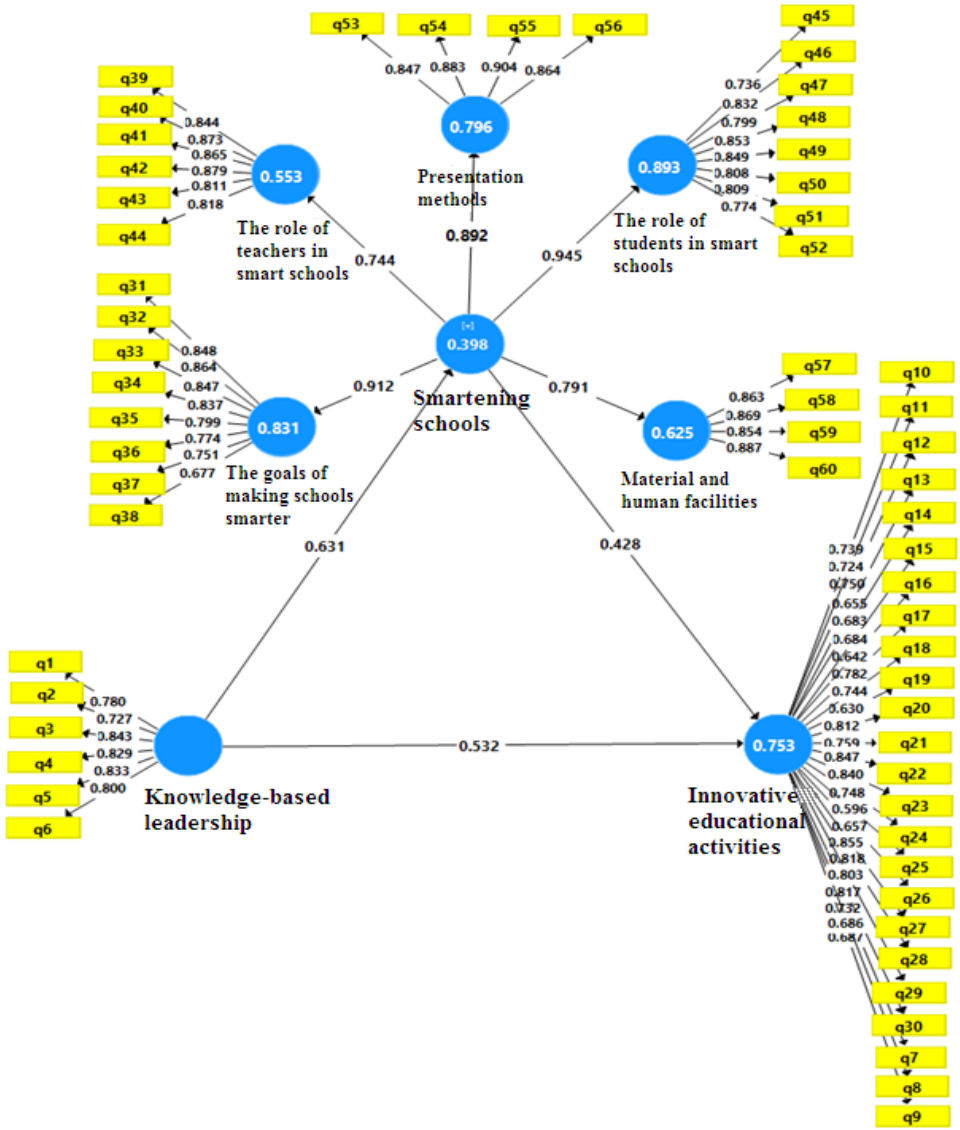

Figure 2. Standard Path Coefficients Of The Structural Model Of The Research

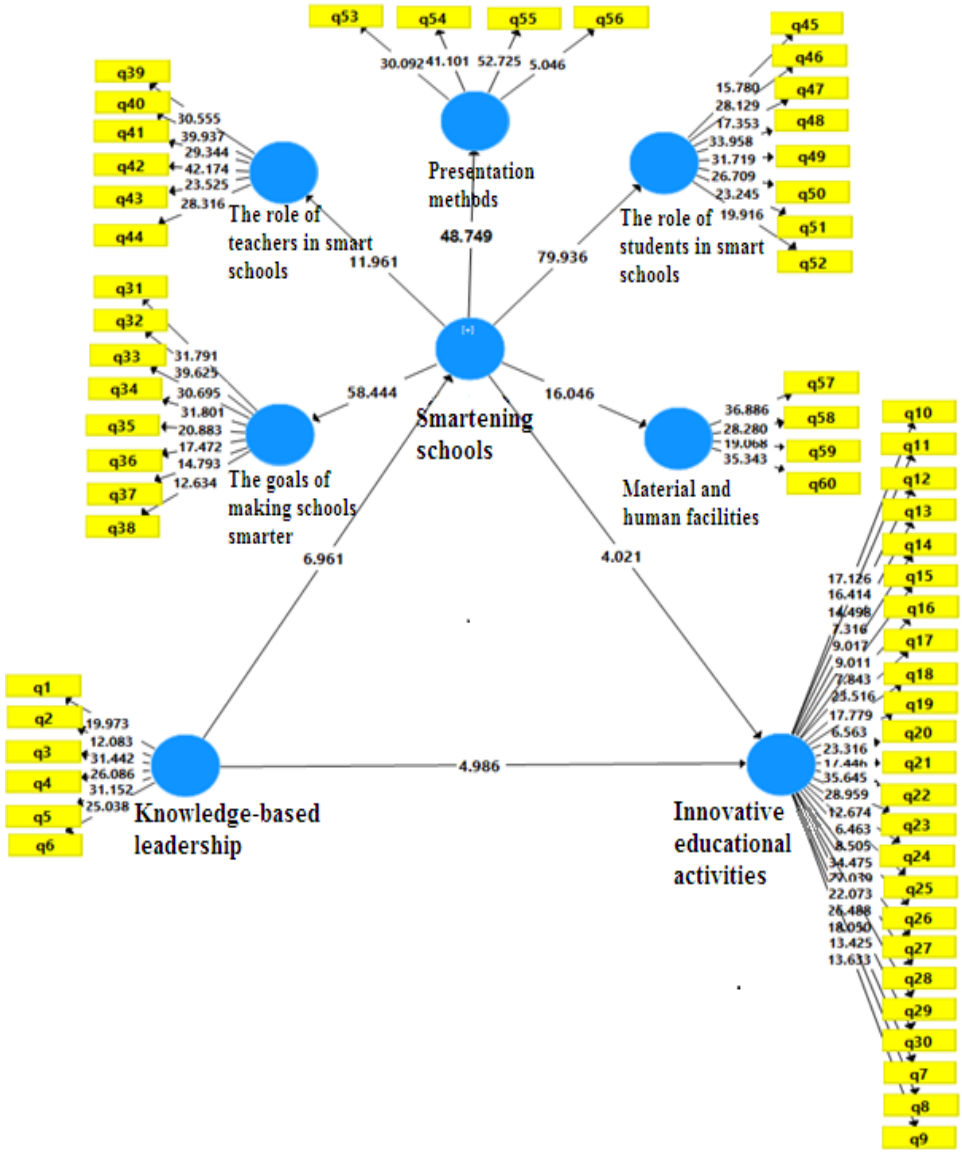

Figure 3. T-statistic coefficients of the structural model of the research

The coefficients of the path, which show the positive and significant influence between the main paths of the final research model, therefore, it can be said that in terms of path analysis, the research model has acceptable validity. Also, the value of the t statistic for all routes is higher than 1.96, and as a result, they are significant at the 95% confidence level (Fig 2 & 3). As seen in Figures 2 and 3 and Tables 4 and 5, all research hypotheses and relationships between variables were significant at the 0.05 level.

Regarding the first hypothesis (the effect of knowledge-based leadership on

innovative educational activities), the value of the direct path coefficient is 0.532 and the value of the t statistic is (4.98), which is higher than the value of 1.96 and is statistically significant, so it can be said According to the collected data and with a probability of 95%, knowledge-based leadership has an effect on the innovation of employees in the first secondary schools of Durood city.

Table 4. Test of research hypotheses (direct relationships)

Hypotheses	Path coefficient	t	p. value	Test result
Knowledge-based leadership has an impact on innovative educational activities	.53	4.98	.000	proving hypotheses
Knowledge-based leadership has an effect on making schools smarter plan	.63	6.96	.000	proving hypotheses
The plan to make schools smarter has an impact on innovative educational activities	.43	4.02	.000	proving hypotheses

In the case of the second hypothesis (the effect of knowledge-based leadership on making schools smarter), the value of the path coefficient is 0.631 and the value of the t statistic is (6.96), which is higher than the value of 1.96 and is statistically significant, so it can be said that with paying attention to the collected data and with a probability of 95%, knowledge- based leadership has an effect on the making school smart plan of activities in the first secondary schools of Durood city.

In the case of the third hypothesis (the impact of school intelligence on innovative educational activities), the value of the path coefficient is 0.428 and the value of the t statistic is (4.02), which is higher than the value of 1.96 and is statistically significant, so it can be said that according to the collected data and with a probability of 95%, the making school smart plan of activities has an effect on innovative activities in the first secondary schools of Durood city.

In order to test the fourth hypothesis of the research and to calculate the significance of the mediating effect of making school smart plan activities, the Sobel test was used. In the Sobel test, Z value is obtained through the following relationship. If the absolute value of Z value is greater than 1.96, it can be said that the mediating effect of a variable is significant at the confidence level of 0.95 (Mears, Gamest & Garino, 2013).

$$Z - value = \frac{a * b}{\sqrt{(b^2 * s_a^2) + (a^2 * s_b^2) + (s_a^2 * s_b^2)}}$$

a: path coefficient between independent variable and mediator,

b, path coefficient between mediator and dependent variable

Sa: standard error of independent and mediating variable path,

Sb: standard error of mediating and dependent variable path.

Table 5. Test of research hypotheses (mediation relationship)

The hypothesis	Type of influence			Coefficient between the independent variable and the mediator		Coefficient between the mediator and the dependent variable		Sobel's statistic	Result
Knowledge-based leadership by mediating the smarting school influence on innovative educational activities.	Indirect	Direct	Total	β	t	β	t	3/881	confirmed
	.27	.53	.80	.63	6.96	.43	4.02		

As can be seen in Table 5, the results of the Sobel test to investigate the mediating role of motivational capital in the effect of benevolent coaching on the development of human capital showed that the value of the Z statistic for this hypothesis was equal to 3.303, which was greater than 1.96, so it can be said that at the 95% confidence level, the mediating role of school smartness in the effect of knowledge-based leadership on innovative educational activities is confirmed, also the indirect effect of knowledge-based leadership on innovative educational activities is equal to 0.270 and it shows that with an increase of one standard deviation In knowledge-based leadership, we will witness an increase in innovative educational activities as much as 0.270 standard deviation indirectly and through the mediation of schools' smartening. Also, the total effect of knowledge-based leadership on innovative educational achievements is equal to 0.802.

Examining The Fit Of The Structural Model

The overall model includes two parts, the measurement model and the structural model, and by confirming its fit, the fit check is completed in one model. To check the fit of the general model, there is only one criterion called GOF. The GOF criterion is calculated according to the following formula. Wetzles, Odekerken-Schroeder and Van Open (2009) have introduced three values of 0.01, 0.25 and 0.36 as weak,

medium and strong values for GOF (Davari & Rezazade, 2013).

The average value of communalities was 0.571 and the average value of R2 was 0.575. According to the following formula, the criterion value, GOF equal to 0.572 was obtained, according to the classification (Wetzels, Odekerken-Schröder & Van Oppen, 2009) shows a strong fit of the overall research model. The results of the overall fit of the model are presented in Table 6 below:

$$GOF=\sqrt{\overline{Comunalitu}}$$

Table 6. Overall Model Fitting Results

Variable	Communalities	R^2
Knowledge-based Leadership	064	-
Innovative Educational Activities	.54	.75
Making Schools Smart Plan	.52	.39
M	.57	.57
GOF	.33	
GOF square root	.57	

Conclusion

To investigate the Knowledge-Based Leadership with the mediating role of schools in Durood high schools the findings of the first hypothesis showed Knowledge-Based Leadership has a positive effect on the innovative educational activities. This result is with the results of Fathi, Ameri & Ghaderzade, (2015), Rahim (2017), Gholampour, Alikhan & Gorgani, (2017),Mario, Bartol & Srivastava(2018), Naqshbandi & Jasimuddin (2018), Oliva & Kotabe, (2019), Jesemanni (2020), Zia(2020), Mahmoudi, Salehi Tagwai Yazdi, (2021), Rajabi Farjad, Mirspasi & Naderi Mehrabani,(2021),and Chaithanapat *et al(* 2022) are consistent.

In explaining this finding, it can be said that. Today, unfortunately organizations and their principals are more interested in increasing material benefits and profits, and pay less attention to the growth and formation of motivational processes in employees. One of the most important leadership models that can be effective in developing ethics, increasing employee trustworthiness, promoting social capital, and finally improving innovative activities, creativity, and improving employee performance is knowledge-based leadership; That is, leadership that is formed based on knowledge management (Taghipourian et al., 2019). As Donat and Di Pablo, (2015) said the need for knowledge leadership is due to the fact that knowledge leadership actions in carrying out innovative activities and access to Sustainable competitive advantage is considered a key element, and in fact, knowledge leadership can be considered as a basic prerequisite for the development and encouragement of actions in line with the goals of innovation in organizations They are

considered the basic axes of the leadership of organizations and based on this, organizations achieve success in realizing their innovative goals, which in connection with the realization of knowledge leadership in the organization make a diligent effort and design and implement desirable plans and visions.

Therefore it can be concluded that if there are knowledge-based leadership methods in schools, as a basic and dynamic variable, the teachers and students of those schools will be more willing to present new ideas and towards innovation in carrying out educational activities. This will have a significant impact on the desired performance in schools and will improve the efficiency and effectiveness of activities and achieve the goals of the education system as much as possible.

The findings of the second hypothesis showed that knowledge-based leadership has a positive effect on making schools smarter. This result is consistent with the results of Hosseini, Aiti & Shokohi Fard (2013), Zain Abadi, & Mohammadvand (2016) and Saraji & Soleimani (2016) Ghaznavi *et al.* (2019) and Cheraghi, Batmani, & Shirbagi (2021). In explaining this finding, it can be stated that the are knowledge-based leadership who are also considered as technology leaders in smart schools by creating a common and positive ideal towards the widespread use of technology and smart teaching tools in the school by the teachers, it is in the inner school. they do; They create an atmosphere and a culture based on which everyone understands the importance of this ideal and its role in the future of the school; Additionally, while mastering the necessary general and specialized knowledge and skills in the field of school smartening, by creating a coherent teaching and learning environment and designing professional growth and development programs, they provide a platform where teachers can learn collectively, share and share knowledge and skills in the field of using information and communication technology equipment in teaching and learning processes, to have an active participation so that all of them can show their professional performance in this learning organization with the optimal and innovative use of technology tools in education and teaching, which these cases will eventually It ends with making education and learning activities in schools more intelligent, and then encourage and facilitate students' participation in the teaching process. (Zeinabadi & Faeli, 2013).

The findings of the third hypothesis showed that the smartening of schools has a positive effect on innovative educational activities. This result was in line with the results of the studies of Arvanitis, Loukis & Diamantopoulou (2013), Dartaj, Lakpour & Bahlouli,(2013), Moghadam (2014)) and Garcia-Alvarez (2015)) and Ahmadi., Hosseini, & Shirbagi. (2023) .In explaining this finding it can be said that In explaining this finding, it can be stated that in the current era, the most important concern of the education system of any country is to create a suitable platform for the growth and excellence of intellectual capital in the information and knowledge society so that all social

groups are able to effectively participate in such a society. In participating, they must learn continuous learning, creativity, innovation, and active and constructive social participation. The realization of this requires a new definition of the role and function of schools as the main educational institutions in society. Smart schools are one of the areas that introduce information and communication technology into the field of education with a comprehensive and holistic model and with predetermined goals and missions. The main goal of the smart school is to prepare the future generation of the country to live in the information age, create the spirit of creativity and innovation, and flourish the potential talents of students according to their interests and potential. Smarting schools can be considered as a learning organization has evolved over time and has continuously developed its teachers, students, and executive abilities, and brought about innovative educational activities in various fields by its employees Schools make it possible to adapt to the dynamic and changing conditions of today's world (Mohajeran, Qalaei and Hamza Rabati, 2013).

Based on this, it can be concluded that according to the plan of smart schools is proposed as an innovative way to integrate FAVA (information and communication technology) in the curriculum with the aim of growing and developing the role of electronic media in teaching and learning and creating innovation in educational activities. In other words, the smart school is indicative of the tendency to create a closer relationship between the classroom and electronic media, which have modified the traditional method of teaching and expanded new aspects in learning knowledge, and it provides the possibility for teachers to present the course materials in novel and innovative ways. This will create the spirit of innovation and creativity in students.

The findings of the fourth hypothesis showed that knowledge-based leadership has a positive effect on innovative educational activities through the smartening of schools. In the explanation of this finding, it can be said that the existence of knowledge-based leadership in schools provides the material and human facilities necessary for using new technologies in teaching and educational processes and providing course materials, and teachers and students use the tools and methods to carry out educational activities in schools. use diverse and up-to-date, which makes all the human factors of that school more willing to present new and creative ideas in performing their duties and move towards innovation in educational activities. We can conclude after exploring and examining various internal and external written and electronic sources related to the field of knowledge and analysis of research variables, no study was found that examines the relationship and impact of these three variables simultaneously. This can be the difference between the present research and the previous studies in this field, so it is hoped that the results of this research can be a small step towards improving innovative educational activities in schools and, following that, the formation and

continuation of the culture of innovation. Among the future builders of our beloved country.

Suggestions

In line with the results of this research, suggestions are made to increase innovative educational activities in schools, through knowledge-based leadership and making schools smarter:

1) Holding motivational and informative workshops and conferences in order to familiarize and create more motivation for teachers in using technology tools in the teaching process and teaching and learning activities, so as to improve innovative educational activities in schools.

2) To promote the research cooperation of education and training with universities and scientific institutes in order to carry out more researches in order to investigate other causes of the unacceptable level of innovative educational activities in schools and to provide practical solutions to improve the current situation.

3) In the selection and selection of school principals, it is suggested to have knowledge leadership thinking, to have an innovative spirit in doing things and to have sufficient mastery of Information gathering equipment used in schools should be considered.

4) Considering that it was confirmed in this research that the smartening of schools has a positive and meaningful effect on innovative educational activities in schools, it is suggested that principals and academic leaders, the components of smartening schools (goals of smart schools, the role of teachers, the role of students, method material and human resources) should be taken into consideration so that with the optimal and all-round implementation of the smartening of schools, the promotion of innovative educational activities in schools will be provided as much as possible.

5) In order to carry out the school affairs well and promote the innovative activities of teachers and students, it is suggested that the administrators use the capacity of the teachers' council in making important school decisions, and by creating a friendly atmosphere with mutual trust, work teams solve issues and problems, which On the one hand, it causes the transfer and sharing of experiences and the improvement of teachers' knowledge, skills, and abilities, and the implementation of innovative educational activities, and on the other hand, it increases their enthusiasm and preparation for teaching.

6) Adapting the structure and organization of traditional schools with information and communication technology in order to develop smart schools; In this regard, it is necessary to consider a deputy under the title of "Innovation and Technology" with the responsibility with the description of the duties and scope of authority determined in the structure of all schools to take responsibility for maintaining and managing the smart equipment of schools and improving the level of innovation.

7) It is necessary for those responsible for performance evaluation to pay attention to the level of promotion of innovative activities in the annual evaluation of principals and teachers, efforts to equip the school with technology and smart devices, as well as create an environment for development and knowledge sharing in schools, and

part of the incentives and awards Rewards for principals and teachers are dependent on activities in these departments.

8) It is necessary for the Ministry of Education to provide the necessary infrastructure, hardware and software to create smart schools and to carry out innovative educational activities in schools.

9) Senior principals in the education and training system can promote creativity and innovation at all levels of the organization and among all employees by modifying organizational processes and creating an appropriate performance evaluation system and creating an appropriate reward system for innovative employees to ultimately create a creative and innovative organization. .

10) Holding various in-service training courses, conferences and seminars in the field of establishing smart schools in education, so that teachers and administrators can be well informed about this issue, so that they can use the scientific and educational facilities efficiently. and to be more familiar with the philosophy of smart schools

11) Considering study opportunities for principals and teachers to know the results of the implementation of the smart plan in some schools and their enthusiasm for the emergence of creativity and presenting new ideas in the field of using information technology in teaching.

12) It is proposed to study the impact of other leadership styles on innovative educational activities through qualitative methods of data collection, such as interviewing and observing, in order to explain the research topic as much as possible

Ethical considerations

Following the principles of research ethics, In the present study, informed consent forms were completed by all the subjects.

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