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School Leaders' Innovation Managements and Organizational Stress: A Relational Model Study*

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Abstract This century is a century in which vertiginous rapid change is experienced. In each day, new innovations are being part of our lives. For this reason, innovation term is a dynamic concept that emerges in every field and it is inside of life. “Innovation” is an English term but it is adopted in daily life in Turkish as “inovasyon” with the same meaning. The world is rapidly changing and developing, so the understanding of innovation term as a dynamic continuum should be guided and managed in a correct way. Schools are also affected from this situation both directly and indirectly. School leaders have some duties and responsibilities to gain the positive aspects of the influence and to avoid from negative aspects. While school leaders provide this interaction that is based upon innovation, they should preserve their schools’ existing balance, and they should carry out innovations in a correct proportion, shape and time. Otherwise, they may harm their schools’ organizations or functions. Another variable that may harm schools’ organizations or functions is organizational stress. Organizational stress is termed as a situation that may supply divergence from normal functions of people. It may differ with respect to people and is caused by the relations between person and organization. In any organization, the increase in the organizational stress level may result with divergence of workers from normal functions. The cause of this is the psychological and physiological fatigue of workers. Under this circumstance, behaviors of the person may be affected both negatively and directly. The aim of this study is to investigate the level of relationship between school leaders’ innovation management approaches and organizational stress. Descriptive relational screening model is used throughout the study. The population of the study consist of 940 elementary, 911 middle, and 649 high school teachers in Kocasinan province of Kayseri city. Stratified sampling procedure is used and nearly 1000 inventory is distributed to all school levels. 171 elementary, 178 middle and 164 high school teachers replied the data collection tool. Data are analyzed using R 3.2.4 and SPSS 21.00. In the light of the results, significant but small relationships in the negative direction are observed across organizational culture and structure factor of school leaders’ innovation management behaviors and (i) clustering structure, (ii) role structure, and (iii) cultural structure factors of organizational stress. In addition, again small but significant relationship in the negative direction is observed across project management factor of school leaders’ innovation management behaviors and cultural structure factor of organizational stress.

Keywords School Leaders, Innovation, Innovation Management, Organizational Stress

1. Introduction

Change and innovation seem to grow rapidly in the century we live in. Individuals, societies, organizations... briefly everything are necessarily affected in a positive or negative way by this change and innovation processes. While it does not seem possible to avoid this affect it is also not meaningful. The important thing is to be able to know how to benefit from this change and innovation phenomena in accordance to our individual or organizational purposes, because an uncontrolled innovation or power of change may give serious and permanent damages to the existing structure. In this sense, it is necessary to manage and control the power of change and innovation. Correspondingly we see that lately under the name of "innovation management" a concept has emerged. When we examine conceptually, innovation is mostly under debate as a new idea, product, service or system [2,12,36]. As is known, like all organizations educational organizations too are affected by the changes occurring around its environment. However, the presence of educational organizations' responsibility to start change is the leading basic feature which distinguishes educational organizations from other organizations [24]. In order to progress and improve, an organization needs the phenomenon of "innovation management". Taking the innovation to be held in a multiple accession process will certainly be more democratic. Difficulties are experienced in the acceptance of transition to the 4+4+4 education system, which is a radical change and innovation in our education

system, as this multiple accession process was ignored [13]. In the organizational processes of the administrators, they should pay attention to these and strengthen the organizational structures. In addition to this, according to Douglas, Overstreet and Hazen [11], managing the innovations properly is quite effective on improving the performances of employees in the organization. As is known, the manners of administrator are also quite effective on reaching the goals of an organization [3].

The irrepressible progress occurring in technology and science has caused the change of administrator concept by affecting it too and led to the emergence of leadership concept instead. Now we see that the concept of leadership is used in the schools instead of the concept of school administrator. Leadership is a notion which requires supervisory skills such as taking more responsibility than the administrators do, gaining a visional point of view and making an impact. Schools need an effective leader in order to develop a shared and supported vision or visions. In the management process, style of the leader is effective on both organization and employees [19]. Since they are in a social and open organization structure, schools are affected by what is happening around their environments and also affect these environments. In Toytok's research (2016), he discovered that environmental factors are quite effective on schools and this situation also affects the education quality. However, it should be remembered that not only school and administration but also families have a significant place in this process [27]. Therefore, education systems should have a structure encouraging innovation with a holistic approach and be the pioneer of innovation. The values such as solving, entrepreneurship and creativeness which take place in the philosophy of modern education systems are only possible by creating an innovative school spirit [15]. To create an innovative school spirit, effective use of innovation management is required.

Since organizations mostly have a permeable structure, a change occurring within organization creates a positive or negative effect like a living organism. One of these effects is organizational stress. With the meaning of the word, the concept of stress generally has a structure which indicates negative feelings and pressure. However it should be remembered that stress is categorized in two: positive stress and negative stress [25]. There are many factors that cause stress on individuals. One of these factors is the sources of organizational stress. Organizational stress is explained with many factors such as individual's excess workload, long working hours and insufficiency of wages [4]. In addition to this, the innovations occurring within organization is also effective as the concept of innovation has a confusing structure including uncertainty and may create contradictions. Thus, for the innovation management it is required to discover the one that innovation will be held and draw thoroughly the frame of the field that the innovation will be applied in [1]. In this way, stress-related responses of organizations will be minimized.

The aim of the research is to determine whether there is any meaningful relationship between school leaders' innovation management behaviors in their schools and the organizational stress or not and to contribute to science and researchers with the results based on the obtained data and to guide the school leaders in management practices.

2. Methods

In the research among the quantitative research methods, relational descriptive survey model was used. The relational descriptive survey model is a research model describing a situation or an occurred event as it is and indicating the relationship between the variables that cause this situation, their effect and degree [17]. The population of the research consists of 940 primary, 911 secondary and 649 high school teacher who works in Kocasinan, Kayseri. By getting stratified sampling in the research 400 inventories to primary and secondary school (for each of them), 250 inventories for high school were distributed and a feedback from 171 primary, 178 secondary and 168 high school has been provided. According to demographic variables the distribution of participants who participated in this research is shown in table 1.

Table 1. Information on the sample of the research

	N	%
Gender		
Female	291	52,1
Male	268	47,9
Branch		
Classroom Teacher	180	32,2
Branch Teacher	379	67,8
Professional Seniority		
5 years and less	79	14,1
6-10 years	105	18,8
10-14 years	135	24,2
15 years and older	240	42,9
Type of School		
Primary School	193	34,5
Secondary School	188	33,6
High School	178	31,8
Total	559	100,0

As an inventory of data collection, for innovation management variable "Scale of Innovation Management at Schools" developed by Bülbül [8] which has 4 extents and 32 subjects, for organizational stress "Scale of Organizational Stress" developed by Pehlivan [26] which has 6 extent and 35 subjects were used in the research. For the analysis of obtained data, R 3.2.4 [30] and SPSS 21,00 packaged softwares were used. The method of confirmatory factor analysis (CFA reference) *"cfa"* function which is defined in *"lavaan"* library version of 0.5-20 was used in the analysis of construct validity of the inventories [31]. The suitability of the model to the data was determined by the analysis of compatibility values of Chi-square [16], Comparative Fit Index (CFI) [9,18], Tucker Lewis Index (TLI) and Root

Mean Square of Approximation (RMSEA) [9]. Cronbach Alpha values were calculated for the calculation of reliability. Coefficient of pearson correlation was calculated and tabulated for the relation between variables.

3. Results

Table 2. The fit index results of the measurement model

Minimum Function Test Statistic	3660.609
Degrees of freedom	2099
P-value (Chi-square)	.001
Comparative Fit Index (CFI)	.950
Tucker-Lewis Index (TLI)	.947
RMSEA	.038

The result of the fit index that is made regarding the validity of the research model related to the two variables "innovation management" and "organizational stress" which are required to be determined in the research is given in table 2.

According to the results shown in table 2, for the compatibility of the research model created for the variables we want to measure, the value of P-value (Chi-square) being .001 indicates that our model gave us a more significant result than zero. In addition to this, the value of Comparative Fit Index (CFI) come out to be .950 and the value of Tucker-Lewis Index (TLI) come out to be .947 and this states that both of the values show us a good fit as they are over .95. According to Hu and Bentler [16], the more CFI and TFI values get .95 and higher the more it represents that the research is modelled so well. In addition to this, the value of RMSEA being .038 is also an indicator of the fit. According to Browne and Cudeck [7], if the value of RMSEA is .050 and lower, it represents that the fit increases. According to the statistical results that are made, it can be said that the research indicates a good fit.

The data obtained by making Confirmatory Factor Analysis (CFA) for the innovation management and the extent of organizational stress and the clauses which are the inventories used in the research is represented in table 3 and table 4.

Table 3. The factor loads of the innovation management inventory

		λ
Input Management ($\rho = .816$)		
1	I try/ he tries to get support from public institutions around the school for the innovation activities in the school.	.657
2	I try/ he tries to get support from private institutions around the school (chambers, non-governmental organizations, etc.) for the innovation activities in the school.	.667
3	I get/ he gets the support of an expert(consultant) from outside school about innovation.	.706
4	I allocate/ he allocates physical spaces in the school (meeting rooms and study rooms) to contribute the innovation activities.	.682
5	I provide/ he provides the supply of the tools and equipments that be used in the innovation process.	.718
Innovation Management ($\rho = .850$)		
6	I ensure/ he ensures the participation of the entire school personnel to a variety of events (in-service training, seminars, etc.) in order to achieve external information that is necessary for the innovation.	.654
7	I provide/ he provides the supply of resources such as books, magazines etc. in order to achieve external information that is necessary for the innovation.	.697
8	I follow/ he follows the new developments in the field of education.	.647
9	I endeavor/ he endeavors for the innovations in the field of education to be understood by the entire school personnel.	.668
10	I work/he works for our school to have a clear vision of innovation which is known and shared by the entire school personnel.	.747
11	I immediately stop/ he immediately stops the innovation projects if I feel/ he feels that the project will not make a positive contribution to the school and the surrounding area.	.762
Organization Culture and Structure ($\rho = .889$)		
12	I emphasize/ he emphasizes the importance of innovative approach to the entire personnel.	.723
13	I explain/ he explains to the entire school personnel all the contributions of the innovation that will bring to the school and the surrounding area.	.794
14	I appreciate/ he appreciates the innovative individuals at the school.	.742
15	I respect/ he respects the creative and innovative ideas of the entire school personnel.	.752
16	I clearly encourage/ he clearly encourages the learning and the effort leading to innovation.	.739
17	I endeavor/ he endeavors to keep the personnel who adopts and defends innovative ideas at school.	.785
Project Management ($\rho = .943$)		
18	I adopt/ he adopts a consensus and a common approach before making a decision.	.711
19	I ensure/ he ensures innovation to be seen as a means of adapting to the environment and environmental integration.	.737
20	I/ he will be clear in the communications with the entire school personnel, students and parents during the innovation process.	.749
21	By creating strong connections between the entire school personnel, I make/ he makes an effort to ensure the dominance of the sense of embracing innovation.	.737

22	I listen/ he listens to the voice of the school environment in all the innovations.	.725
23	I expect/ he expects innovative ideas not from just a single person or a group but from the entire school personnel.	.720
24	I try/ he tries to convince the entire school personnel that the risks taken for innovation will return as a gain.	.714
25	I enable/ he enables the use of school resources efficiently in the innovation process.	.744
26	I give/ he gives priority to the innovations that will make a contribution to the development of our school.	.725
27	I pay/ he pays attention to the choice of the tools and equipment and resources which will be used in the innovation process.	.763
28	I/he will be prepared for the unpredictable results of the innovation process at school.	.719
29	I make/ he makes cost/benefit analysis of the gainings of the school which will be obtained from the innovation.	.749
30	I always control/ he always controls the contributions of the school personnel who participated in this innovation process.	.681
31	I ensure/ he ensures that all the personnel to work in cooperation with each other to develop innovative projects.	.718
32	I develop/ he develops criteria to measure the effectiveness of our innovation projects.	.641

NOTE: For each extent, the results of the internal consistency index of Raykov Rho are given inside the parentheses.

Table 4. The factor loads of the organizational stress inventory

Stress Sources Related to the Duty Structure ($\rho = .834$)		λ
1	The length of the working hours	.460
2	Inadequacy of the wages	.464
3	Having less opportunity to get promotion	.437
4	Work which is boring	.651
5	Crowded workplace	.614
6	Noisy work environment	.556
7	Poor lighting in the workplace	.669
8	The weight of the workload	.735
9	What is expected from you being unclear	.766
Stress Sources Related to the Structure of Authority ($\rho = .887$)		
10	Legislation which is complicated	.741
11	Managers who do not encourage	.727
12	The lack of authorization	.709
13	The responsibilities which raise concerns	.692
14	The obligation to provide important decisions	.728
15	Work-related responsibilities and authority that are not clearly defined	.738
16	The absence of injustice while assessing the staff	.661
17	Conscientious responsibility created by the decisions	.629
Stress Sources Related to the Production Structure ($\rho = .828$)		
18	The obligation to do the expected work in a very short time	.731
19	The lack of tools and equipments used while working	.633
20	Inability to fully use the skills on the work that is done	.707
21	Not receiving a recompense for one's work	.644
22	Difficulty in being able to remain neutral while on duty	.780
Stress Sources Related to the Structure of Aggregation ($\rho = .936$)		
23	Unrest in the business environment	.857
24	Incompatibility with the colleagues	.856
25	Conflict with the superiors	.874
26	Conflict with the subordinates	.846
27	Unfair demands of the students' parents	.711
28	The lack of common interests with colleagues	.795
29	Gossiping in the workplace	.816
Stress Sources Related to the Role Structure ($\rho = .794$)		
30	Different people at the workplace having different expectations than you have	.845
31	The difference between your personality and your job	.776
Stress Sources Related to the Cultural Structure ($\rho = .816$)		
32	Despondency	.814
33	The differences in political views with colleagues	.740
34	The obligation to obey the rules established by colleagues	.729
35	The low status of the profession	.612

NOTE: For each extent, the results of the internal consistency index of Raykov Rho are given inside the parentheses.

Table 5. Correlation results

	Innovation Management			
	Dimensions	Input Management	Innovation strategy	Organization Culture and Structure	Project Management
Organization Stress	Duty Structure	-0,077	-0,033	-0,069	-0,060
	Authority Structure	-0,038	0,007	-0,012	-0,062
	Production Structure	0,024	0,076	0,059	0,032
	Aggregation Structure	-0,023	-0,032	-0,106*	-0,066
	Role Structure	-0,052	-0,045	-0,103*	-0,056
	Culture Structure	-0,088	-0,097	-0,154***	-0,107*

Note: It is meaningful for * p≤ .050, ** p≤ .010 and *** p≤ .001.

According to the data in table 3, when the data related to CFA applied for innovation management inventory is analyzed, it is seen that the factor load of each subject is (λ) .64 and higher. These values represent that they are sufficient with regard to the validity of the subjects. Looking at the values of Raykov Rho, it is seen that the extent of the input management is .816, the extent of innovation management is .850, the extent of organizational culture and structure is .889 and the extent of the project management is .943. According to Raykov [28,29], it is accepted that the more the obtained results get .70 and higher, the more reliability and validity increases that much. These results indicate that inventory of innovation management has the conditions for reliability and validity needed for the research.

The results of the confirmatory factor analysis (CFA) for the organizational stress extent which is another variable of the research and for its clauses are represented in table 4.

According to the data given in table 4, when the data related to CFA which is applied for the organizational stress inventory is analyzed, it is seen that the load of each subject is (λ) .46 and higher. These values represent that they are sufficient with regard to the validity of the subjects. Looking at the values of Raykov Rho, it is seen that the extent of Stress Sources Related to the Duty Structure is .834, the extent of Stress Sources Related to the Structure of Authority is .887, the extent of Stress Sources Related to the Structure of Production is .828 and the extent of Stress Sources Related to the Structure of Aggregation is .936, the extent of Stress Sources Related to the Role Structure is .794 and the extent of Stress Sources Related to the Cultural Structure is .816. According to Raykov [28,29], it is accepted that the more the obtained results get .70 and higher, the more reliability and validity increases that much. These results indicate that organizational stress inventory has the conditions for reliability and validity needed for the research.

For the relation between innovation management and organizational stress, the correlations of the sub extent was calculated and represented in table 5.

According to the results in table 5, when the relation between innovation management and organizational stress is analyzed it is seen that the variable of innovation management and the variable of *organizational culture* and *structure* extent and organizational stress are in a low-level , negative and significant relation between the sub extents of *aggregation* structure (for r = -0,106 and p≤ .050), role structure (for r = -0,103 and p≤ .050) and culture structure (for r = -0,154 and p ≤ .001). Also, it is seen that *project management* which is a sub extent of the variable of innovation management and cultural structure extent of organizational stress have a low-level, negative and significant relation.

4. Discussion

When the results obtained from the research are analyzed, it is seen that there is a low-level, negative and significant relation between innovation management and organizational stress. Increase of the innovation level in an organization has an impact on a significant structure contributing to the reduction of stress within the organization. It should not be forgotten that the most significant driving force in an organization is the leader. The behaviors of the leaders have a direct influence on this process. About this subject, in the research of Lin, Su & Higgins [20] it is stated with similar expressions that innovation management should be used effectively in order to maintain an effective and dynamic management approach. Uğurlu, Kıral & Aksoy [37] too, have emphasized in their researches that the management is important to maintain an unending and dynamic process most effectively for all employees of the organization and for the organization. In this way it can be contributed to the efficiency of the education process. In the research of Manea, A.D. [23], it is stated that school management being effective in the innovation management improve the quality of school and contribute to the performance. Though innovation management creates an uncertainty in an organization, in fact it is an approach reducing the problems of the organization and preventing the occurrence of problems. This situation is seen as a factor preventing stress to be experienced by the organization and ensuring the reduction of the stress level. In researches that are made, it is demonstrated that there are many variables affecting the level of stress. Pehlivan [26], in his research named "Stress Sources in Education Management'', aimed to demonstrate the situations causing stress. According to the research, conditions such as insufficient wages, injustice,

incompetence and lack of tools and equipments put stress on managers. In the research of Bertan [5], the relation between organizational stress and organizational commitment was analyzed and low-level, significant relations were detected. In their researches Töremen & Tan [35] and Titrek[32] has found that the concept of justice has a significant and negative relation between procedural and distributive justice and work. In addition to this, ethical climate in organizations also has an impact on stress. Yılmaztürk [38] in his research has found that organizational stress levels vary according to the variables such as title, seniority and personality. As is seen, there are many variables having an impact or constituting a source on organizational stress. We tried to reveal whether there is a relation between the organizational stress and the variable of innovation management or not. While it is known that the school managers' viewpoints related to these two significant concepts can be increased most effectively with education, in the research of Toytok & Çelepçıkay [34] it is seen that school managers do not lean towards education.

5. Conclusions

According to the date obtained from the research, firstly it is seen that our research modeling fit in a valid and reliable structure. This situation shows us that we measured the structure accurately we wanted to measure in the research. Looking at the other results obtained from the research, it is seen that there is a significant relation between the innovation management behaviors of school leaders and organizational stress sources. It is found that this significant relation is negative and in a low-level. When the extent which the significant relations take place in is analyzed, it is seen that this significance is between the organizational culture and structure which is a sub extent of the variable of innovation management , and aggregation, role and structure which are the extents of the variable of organizational stress. The strongest relation between the extents of organizational culture is in the extent of cultural structure. According to this, it can be said that the increase of the innovation management behaviors of school leaders in an organization create a significant impact reducing stress in an organizational structure.

In conclusion, our school leaders need to provide an effective process of innovation management so that our schools within an open and social organization system structure can keep up with the changing and renovating world and reduce the stress level of our educational organizations. In this way, our educational organizations provide a significant contribution to the path of creating a sustainable effectiveness.

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According to the results obtained from the research and the results emerging in parallel with other researches, an experimental study related to the concepts of innovation management and organizational stress can be conducted with the school leaders. According to the experimental results, workshops can be done with the school leaders.

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