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Entrepreneurship and Innovation in Science Teachers: What Happens Without Work-Life Balance and Organizational Support? Moderated Mediation Model

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Abstract

This study aims to determine the regulatory role of organizational support perceptions on the indirect impact of science teachers' entrepreneurship perceptions on innovation through work-life balance. The research was conducted within the functional paradigm and in a descriptive and relational survey model. The population of the study consists of full-time science teachers working in the districts of Üsküdar, Fatih, Pendik, Beşiktaş, Kadıköy, Maltepe, and Kartal in Istanbul, Turkey. In the research, four hundred and one science teachers were reached by taking the α=.05 table into account. These teachers were identified by simple random sampling and cluster sampling. In the research, "entrepreneurship, innovation, work-life balance, and organizational support" measurement tools were used. Confirmatory factor analysis and reliability analyses were performed for each of these measurement tools. SPSS 25, AMOS 23, and PROCESS MACRO 3.5 package programs were used for the data analysis of the research. Throughout the research, it was found that there is a statistically significant relationship between entrepreneurship, innovation, work-life balance, and organizational support averages. It was concluded that there is a mediating role of work-life balance in the relationship between entrepreneurship and innovation, and there is a moderating role of organizational support in the relationship between entrepreneurship and work-life balance. Entrepreneurship of science teachers enhances their innovation through work-life balance. Additionally, this indirect relationship is contingent on whether science teachers receive organizational support. In other words, when organizational support provided to science teachers is high, the entrepreneurship levels of science teachers further enhance their innovation through work-life balance.

Keywords: Entrepreneurship, Innovation, Work-Life Balance, Organizational Support, Science Teachers

Introduction

The concept of entrepreneurship is used in the sense of carrying out activities by discovering opportunities with a forward-looking mindset (Pathan et al., 2023). While individuals who are not entrepreneurs cannot become a part of the risks (Daft & Marcic, 2014; Toyirovna, 2023), entrepreneurial individuals can look favorably on risky situations as well as predict whether organizations will succeed in situations of uncertainty (Naresh et al., 2012). However, in terms of educational organizations, there is a need for entrepreneurial and innovative science teachers who can provide purpose-oriented and continuous guidance and turn risks into success (Syapriyuda & Santosa, 2020). Innovation is a concept that encompasses a wide range of things, from small changes applied to the existing products and processes of the organization to the launch of products that change the rules in the market and incorporate the latest technological developments (Cui et al., 2023; Dibrell et al., 2011). In the relevant literature, the concept of innovation is handled with the concepts of company and product innovation. Firm innovation is a concept expressed as the ability and tendency of the organization to perceive new ideas in order to develop new products (Rubera & Kirca, 2012). Product innovation is a concept that has a strong and positive impact on the new product development performance of the organization (Kleinschmidt & Cooper, 1991). We can think of educational organizations as innovative organizations that include company and product innovation (AlMalki & Durugbo, 2023). Because for a society to progress and reach the level of developed countries, it must have qualified, qualified science teachers and a good education system (Unal,

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2022). In addition, the work-life balance of science teachers, who are desired to be entrepreneurial and innovative, should be regulated. The concept of work-life balance is used in the relevant literature with expressions such as "harmonization of work and family life" and "integration of work-personal life" (Gümüş & Türkyılmaz, 2017). According to Apaydın (2020), work-life balance is a strategic human resources management tool designed to enable employees to balance their roles and responsibilities between family and work and to make the employee feel good. According to Gardner (1990), work-life is the environment in which the employee has the opportunity to realize himself, gives the feeling of achievement, and interacts the most with happiness, which is the main purpose of life. For this reason, business life should not only be looked at from a philosophical point of view, but also from a management point of view (Kul, 2016). For a quality, healthy and happy life, "family, environment, work, individual" living spaces should be in balance (Rajitha & Sumathi, 2023; Varicioglu, 2003). A happy life that everyone desires can only be achieved through balance (Aycan et al., 2007; Brough et al., 2020). In this context, balance is a concept that is tried to be established by taking into account the factors affecting work and family life and is in the interaction of various factors (Le et al., 2020). The concept of work-life balance includes different intertwined areas similar to the links of chains such as family, work and education lives, and social activities of people (Uslu, 2020). However, in the teaching profession, which includes science teachers, work-life imbalance is experienced intensely due to reasons such as job description, authority and responsibility uncertainty. Therefore, teachers also have difficulties in adapting between business life and personal life (Apaydın, 2020). Science teachers should be given the necessary organizational support to overcome these challenges. Organizational support refers to a judgment reached by the employee as a result of internal evaluation and interpretation of his /her perceptions of how much he/she cares about the organization he/she works for (Bhende et al., 2020; Eiseberger et al., 1986). Organizations that support their employees implement policies such as giving importance to the personalities, jobs, opinions and thoughts of the employees (Maan et al., 2020; Utomo et al., 2023). These policies are important for the future of the organization and its employees. Because if employees feel that they are appreciated, valued, necessary and useful for their organization, they will be able to integrate with their organization they are a member of (Özdemir et al., 2019). A harmonious and orderly system in organizations will contribute to the effectiveness and efficiency of organizations. In addition, the organization that supports its employee should feel responsible to the employee. For this reason, supporting organizations should ensure job security by taking and evaluating the ideas, suggestions and criticisms of the employees as necessary, give job security in case of success, maintain a high level of public relations for the organization, and moreover, they should care about the employees (Jehanzeb, 2020; Kao et al., 2023 ; Köse & Gönüloğlu, 2010; Ridvan et al., 2020). In terms of educational institutions, it is important that the support perceptions of science teachers are positive in terms of ensuring membership and identity integration. In addition, thanks to the perception of organizational support, science teachers' job satisfaction and efforts will increase, as well as working with a positive mood, and the way for them to be even more willing in school will be opened.

Research Problem

Entrepreneurship is the pursuit of new opportunities outside of the resources owned. In order to take advantage of these opportunities, the concept of entrepreneurship and entrepreneurship education in the Turkish National Education System, as well as all over the world, has taken its place in the education policies in the 2014-2018 *Turkey Lifelong Learning Strategy Document and Action Plan and the 2010-2014 Ministry of National Education Strategic Plan*, and it has been emphasized that entrepreneurial individuals should be trained. Even in the 2023 Education Vision Document, special emphasis is placed on entrepreneurship. Considering that teachers, who are the main subjects of education, train people from preschool to higher education, entrepreneurship education is desired to take the lead in education policy and to develop entrepreneurship skills. On the other hand, the workload of the teachers we want to be entrepreneurs is unfortunately not commensurate with their professional prestige, salaries and working hours. In the relevant legislation of the teaching profession, it will be seen that the workloads of teachers are very heavy and the framework of what their duties and responsibilities are cannot be fully drawn. For this reason, it seems difficult for science teachers to establish a work-life balance in the current situation, but we can still say that science teachers in the Turkish National Education System do their best to achieve this balance. On the other hand, innovations and changes in societies directly affect the education system. As a matter of fact, teachers are expected to lead the innovation in societies and to change and develop individuals who have access to school. The successful completion of these expectations will only be ensured by the financial and moral support of teachers. When the relevant field is searched in the literature, *entrepreneurship*, Ahmad & Siew (2021), Hisrich & Peters (2020), Norena-Chavez & Guevara, (2020), Vázquez-Parra et al., (2023); *innovation*, Dohse & Niebuhr (2018), lyde et al., (2018), Redondo &

Ladage, (2023), Siew & Ahmad (2023), Than et al., (2023); *work-life balance*, Bellmann & Hübler, (2021), Gurel (2018), Keser & Kümbül (2016), Kelliher et al., (2019), Rajitha & Sumathi, (2023); *organizational support*, Asgari et al., (2020), Aydoğan (2018), Chen (2021), Eisenberger et al., (1986), Mazıoğlu & Kanbur (2020), Sumardjo & Supriadi, (2023). However, the majority of the studies have been carried out in the fields of business, economics, psychology and health. It has been seen that the studies on science teachers working in educational institutions are very rare. From this point of view, the main purpose of this research is to determine the regulatory role of perceptions of organizational support in the indirect effect of entrepreneurship perceptions of science teachers on innovation through work-life balance. With this research, at the same time, how the relations between these variables change (mediation) or in which situations they change (regulation) will be based on both the mediation and regulatory mechanism (moderated mediation) model and the indirect effects of the research problem and therefore the social reality related to the problem will be revealed.

Method

Pattern and Paradigm of Research

This research, which aims to determine the regulatory role of perceptions of organizational support in the indirect effect of entrepreneurship perceptions of science teachers on innovation through work-life balance, was conducted in a descriptive and relational screening model. The main purpose of survey models is to identify the characteristics of a group or universe (Creswell & Creswell 2018). The philosophy of the research is realism and the paradigm is the functional paradigm (Gunbayi & Sorm, 2020). The theoretical model of the research Hayes (2018) was created based on "Model VII". The conceptual model of the research is given in Figure 1.

Based on the theoretical model of the research, the following hypotheses were sought.

H_1 = There is a relationship between the averages of entrepreneurship, innovation, work-life balance, and organizational support universes.

H_2 = Work-life balance has a mediating role in the effect of entrepreneurship on innovation.

H3= Organizational support has a regulatory role in the impact of entrepreneurship on work-life balance.

H4= Organizational support has a regulatory role in the indirect impact of entrepreneurship on innovation through work-life balance.

Universe and Sample

The research universe consists of science teachers working in the districts of Üsküdar, Fatih, Pendik, Beşiktaş, Kadıköy, Maltepe, and Kartal in Istanbul province. According to the data obtained from the Strategy Development Unit of Istanbul Provincial Directorate of National Education, the number of science teachers working in these districts is as follows: Üsküdar (168), Fatih (120), Pendik (65), Beşiktaş (48), Kadıköy (92), Maltepe (141), and Kartal (147), with a total of 776 science teachers. In determining the sample size, it was considered that a sample group of n=257+ individuals could represent a population of 776 individuals, taking into account the α=0.05 table of Blair et al., (2023), Johnson & Christensen, (2020), and Yu, (2022). Probability-based sampling techniques, namely cluster sampling and simple random sampling, were used in selecting science teachers. The general sample ratio was calculated as [257/776=.331] to determine the sample size allocated to each district. Accordingly, 56± science teachers were selected from Üsküdar, 40± from Fatih, 30± from Pendik, 30± from Beşiktaş, 30± from Kadıköy, 47± from Maltepe, and 47± from Kartal using the simple random sampling technique, with an equal chance given to each subject.

Data Collection Tools

In the study, data collection tools included the Entrepreneurship scale developed by Akın & Demirel (2015), the Innovation scale developed by Çolakoğlu & Gözükara (2016), the Work-Life Balance scale developed by Apaydın (2011), and the Organizational Support scale developed by Eisenberger et al. (1986). All items in these measurement instruments are positively stated. The scale items were

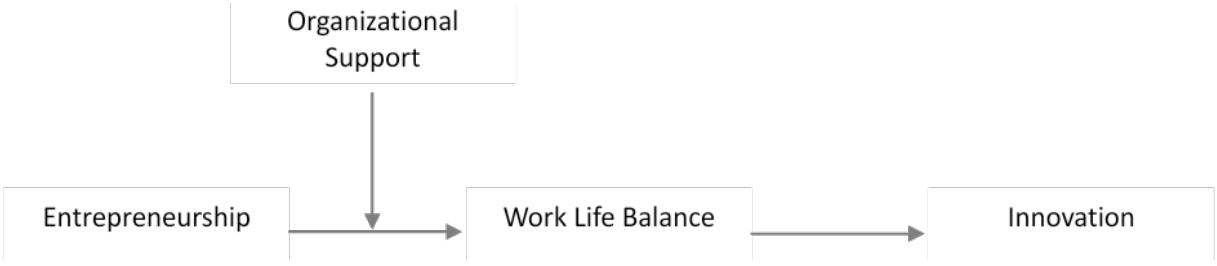

Fig. 1: Conceptual model of the research

Table 1: Confirmatory Factor Analysis, Model Fit Criterion and Model Results (n=401)

Scales	*CMIN / SD*	*p*	*CFI*	*RMSEA*	*GFI*	*RMR*
Entrepreneurship	1.337	.254	.993	.029	.995	.010
Innovation	2.122	.013	.989	.053	.985	.010
Work-Life Balance	3.156	.000	.950	.073	.883	.037
Organizational Support	2.160	.001	.959	.054	.974	.039

Source: Collier, 2020; Thompson, 2004

administered using a five-point Likert scale, ranging from "1- Strongly Disagree" to "5- Strongly Agree". Confirmatory factor analysis and reliability analysis were conducted separately for each of the scales used in the study. The results of the analyses are presented in Table 1.

Confirmatory factor analysis model fit criteria and results were examined in Table 1. Since these values are smaller than both the saturated and independent models, it can be stated that the scale models are close to the reality (Collier, 2020; Denscombe, 2020; Howitt & Cramer, 2017; Stockemer, 2019). The Entrepreneurship scale had a reliability coefficient of α=.600, the Innovation scale had a reliability coefficient of α=.734, the Work-Life Balance scale had a reliability coefficient of α=.846, and the Organizational Support scale had a reliability coefficient of α=.672. According to Field (2018) and Johnson & Christensen (2020), values below .700, and even as low as .500, are considered reliable when attempting to measure psychological constructs (Field, 2018). Additionally, having a small number of items can lead to lower reliability (Özdamar, 2017). Based on these results, it can be concluded that the measurement instruments used in the research are reliable.

Analysis of Data

The data analysis for the research was conducted using SPSS 25, AMOS 23, and PROCESS MACRO 3.5 programs. Multivariate analysis techniques require certain assumptions to be met for the existing data to be applicable. In this research, in preparation for the analysis of the collected data, computations were performed for missing values, outliers, Mahalanobis, Cook's, leverage values, multivariate normality, linearity, multicollinearity, homoscedasticity, and independence (autocorrelation) (Adams & Mcguire, 2023; Creswell & Guetterman, 2019; Heiberger & Holland, 2009). It was observed that the measurement data met these assumptions. Descriptive statistical analysis results for the scales are provided in Table 2.

The skewness and kurtosis values for the scales have been determined within the reference range of -3 and +3 for scales (Cohen et al., 2018; Yu, 2022; Zou & Xu, 2023), and all measurement values fall within this reference range. This indicates that the data follows a normal distribution (Frey, 2018; Loehlin & Beaujean, 2017; Hiebert et al., 2023) in this research. Structural equation models were employed to examine the causal relationships between entrepreneurship (X) and innovation (Y) (Aldrich & Cunningham, 2016). These models represent a type of multivariate statistical analysis that combines factor analysis and regression analysis, incorporating both observed and latent variables (Preacher et al., 2007). To gain a deeper understanding of the examined relationship, mediating and moderating effects, such as work-life balance (M) and organizational support (W), were evaluated. Mediation effect explains how the relationship between X and Y occurs through an intermediary mechanism (Kline, 2016), while moderation effect examines when and under what conditions the effect of X on Y may change (Young, 2017). Conditional mediation analyses integrate mediating and moderating models used to understand causal relationships (Edwards & Lambert, 2007) and explain how the indirect effect of X on Y through M changes depending on the W variable (Hayes, 2018).

Findings

The correlation analysis results for the relationship between entrepreneurship, innovation, work-life balance, and

Table 2: Descriptive Statistical Analysis Results of The Scales (n=401)

Scales	*Arithmetic Mean*	*Standard Deviation*	*Skewness*	*Kurtosis*
Entrepreneurship	4,49	,505	-,728	-,046
Innovation	4,56	,349	-1,267	2,828
Work-Life Balance	4,31	,330	-,488	-,185
Organizational Support	4,44	,443	-,791	,358

organizational support are presented in Table 3 (H_1). The analysis results regarding the mediating role of work-life balance in the impact of entrepreneurship on innovation are provided in Table 4 (H_2). The analysis results concerning the moderating role of organizational support in the impact of entrepreneurship on work-life balance are presented in Table 5 (H_3). The analysis results related to the moderating role of organizational support in the indirect effect of entrepreneurship on innovation through work-life balance are given in Table 6 (H_4).

When examining the correlation analysis results for the variables of the study presented in Table 3, it is observed that there is a positive and statistically significant relationship between entrepreneurship and innovation (r=.529, p<.01), a positive and statistically significant relationship between entrepreneurship and work-life balance (r=.388, p<.01), and a positive and statistically significant relationship between entrepreneurship and organizational support (r=.265, p<.01). Additionally, there is a positive and statistically significant relationship between innovation and work-life balance (r=.508, p<.01), and a positive and statistically significant relationship between innovation and organizational support (r=.310, p<.01). Furthermore, there is a positive and statistically significant relationship between work-life balance and organizational support (r=.402, p<.01). In light of these findings, Hypothesis H_1, which states that "There is a relationship between the means of entrepreneurship, innovation, work-life balance, and organizational support populations," is supported. The analysis results regarding the mediating role of work-life balance in the impact of entrepreneurship on innovation are provided in Table 4.

When examining the analysis results regarding the mediating role of work-life balance in the impact of entrepreneurship on innovation presented in Table 4, it can be observed that entrepreneurship significantly influences work-life balance [β=.253, 95% CI (.194, .313), p<.001]. Entrepreneurship explains 38.8% of the variance in work-life balance (R^2=.388). Furthermore, it is evident that entrepreneurship significantly and positively affects innovation [β=.269, 95% CI (.212, .327), p<.001]. On the other hand, work-life balance significantly influences innovation [β=.378, 95% CI (.289, .466), p<.001]. Together, entrepreneurship and work-life balance account for 62.3% of the variance in innovation (R^2=.623). Entrepreneurship has an indirect effect on innovation through the mediating variable of work-life balance [β=.096, 95% CI (.060, .136), p<.001]. The confidence interval (CI) values in the findings do not encompass zero, and therefore, Hypothesis H_2, which states that "Entrepreneurship has a mediating role in the impact of work-life balance on innovation," is supported. The analysis results regarding the moderating role of organizational support in the impact of entrepreneurship on work-life balance are provided in Table 5.

When the results of the analysis on the regulatory role of organizational support in the effect of entrepreneurship on work-life balance are examined in Table 5, entrepreneurship affects work-life balance [β=.182, 95% CI (.123, .240), p<.001]. Organizational support affects work-life balance [β=.225, 95% CI (.159, .191), p<.001]. On the other hand, it was determined that the effects of entrepreneurship, organizational support, and interactional term variables on work-life balance were significant. The significance value of the beta value of the

Table 3: Correlation Analysis Results for Scales

Variables	*Entrepreneurship*	*Innovation*	*Work-Life Balance*	*Organizational Support*
Entrepreneurship	*1*			
Innovation	*,529***	*1*		
Work-Life Balance	*,388***	*,508***	*1*	
Organizational Support	*,265***	*,310***	*,402***	*1*

Notes: * p<.05; ** p<.01; p<.001 n=401.

Table 4: The results of the Analysis on The Mediating Role of Work-Life Balance in The Effect of Entrepreneurship on Innovation

	Work-Life Balance			*Innovation (Y)*		
Variables	*B*	*LLCI*	*ULCI*	*B*	*LLCI*	*ULCI*
Entrepreneurship (X)	.253***	.194	.313	.269***	.212	.327
Work-Life Balance (M)	-	-	-	.378***	.289	.466
R2	.388			.623		
Bootstrap Indirect Impact	Entrepreneurship→ Work-Life Balance→ Innovation b=.096, %95BCA CI [.060, .136]					

Notes: * p<.05; ** p<.01; p<.001 n=401. LLCI = Sub-Confidence Interval; ULCI= Upper Confidence Interval.

Table 5: Results of the Analysis on The Regulatory Role of Organizational Support in The Effect of Entrepreneurship on Work-Life Balance

	Work-Life Balance (Y)		
Variables	*β*	*LLCI*	*ULCI*
Entrepreneurship (X)	.182***	.123	.240
Organizational Support (W)	.225***	.159	.291
X*W (Interaction)	.171***	.048	.294
R^2		.510	

Notes: * p<.05; ** p<.01; p<.001 n=401. LLCI = Sub-Confidence Interval; ULCI= Upper Confidence Interval.

interactional effect (X.W) variable was checked to determine whether there was a regulatory effect. Accordingly, it was determined that the organizational support variable had a regulatory effect [β=.171, 95% CI (.048, .294), p<.001]. All variables included in the model explained about 51% of the change in work-life balance (R^2=.510). A slope analysis graph is plotted to test whether the effects of entrepreneurship on work-life balance are significant when organizational support is low, medium, and high, and are given in Figure 2.

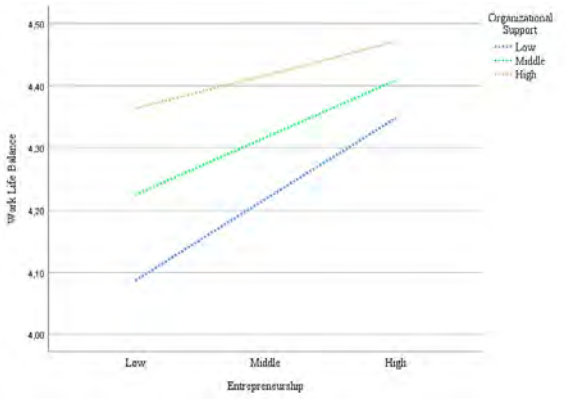

Fig. 2: Graphical Representation of Regulatory Variable Effects (Entrepreneurship X, Innovation Y, and Work-Life Balance W)

When examining the graphical representation of the moderating effects of regulatory variables in Figure 2, it can be observed that when organizational support is low, the positive relationship between entrepreneurship and innovation is significant [β=.103, t=2.666, p=.024 %95 CI (.014, .192), p<.001]. In other words, providing low-level organizational support to science teachers will statistically positively increase their levels of entrepreneurship and innovation. When organizational support is moderate, the positive relationship between entrepreneurship and innovation is significant [β=.171, t=5.557, p=.000 %95 CI (.111, .232), p<.001]. In other words, providing moderate-level organizational support to science teachers will statistically positively increase their levels of entrepreneurship and innovation. When organizational support is high, the positive relationship between entrepreneurship and innovation is significant [β=.256, t=7.069, p=.000 %95 CI (.185, .328), p<.001]. In other words, providing high-level organizational support to science teachers will statistically positively increase their levels of entrepreneurship and innovation. The confidence interval (CI) values in the findings do not encompass zero, and based on these results, "H_3= Organizational support has a moderating role in the relationship between entrepreneurship and work-life balance" hypothesis is supported. When statistically analyzing the results and graphs regarding the moderating role of organizational support, it can be concluded that providing low-level organizational support to science teachers increases the beta coefficient by 10.3% in a statistically positive and favorable manner; providing moderate-level organizational support increases the beta coefficient by 17.1% in a statistically positive and favorable manner; providing high-level organizational support increases the beta coefficient by 25.6% in a statistically positive and favorable manner. An increase in organizational support will also raise the perception levels of entrepreneurship and innovation among science teachers. The analysis results of the indirect effect of entrepreneurship on innovation through work-life balance with the moderating role of organizational support are given in Table 6.

When examining the analysis results regarding the moderating role of organizational support in the indirect effect of entrepreneurship on innovation through work-life balance in Table 6, it can be observed that entrepreneurship significantly and positively affects innovation [β=.269, %95 CI (.212, .327), p<.001]. Work-life balance significantly and positively influences innovation [β=.378, %95 CI (.289, .466), p<.001]. Organizational support significantly and positively affects innovation [β=.225, %95CI (.159, .291), p<.001]. Organizational support has a moderating effect in the model [β=.171, %95 CI (.048, .294), p<.05]. All the variables included in the model explain approximately 62.3% of the variance in innovation (R^2=.623). The moderated mediation index is the ultimate evidence of moderated mediation effect analyses (Hayes, 2018). Therefore, the significant value of the moderated mediation index indicates that in the indirect effect of entrepreneurship on innovation through work-life balance, there is a moderating role of organizational support [β=.064, %95 CI (.010, .117), p<.01]. The graphical representation of the moderated mediation effect and its direct and indirect effects is provided in Figure 3.

Table 6: Results of the Analysis on The Regulatory Role of Organizational Support in The Indirect Impact of Entrepreneurship on Innovation Through Work-Life Balance

	Work-Life Balance (M)			*Innovation (Y)*		
Variables	*β*	*LLCI*	*ULCI*	*β*	*LLCI*	*ULCI*
Entrepreneurship (X)	.253***	.194	.313	.269***	.212	.327
Work-Life Balance (M)	-	-	-	.378***	.289	.466
Organizational Support (W)	-	-	-	.225***	.159	.291
M*W (Interaction)	-	-	-	.171***	.048	.294
R2	-			.623		
Indirect Effect				-	-	-
Low Organizational Support	.106**	.019	.194	-	-	-
Medium Organizational Support	.182**	.123	.240	-	-	-
High Organizational Support	.258**	.186	.329	-	-	-
Moderated Mediation Index	.064**	.010	.117			

Notes: * p<.05; ** p<.01; p<.001 n=401. LLCI = Sub-Confidence Interval; ULCI= Upper Confidence Interval.

When examining the indirect effects of entrepreneurship on innovation through work-life balance with the moderating role of organizational support in Table 6, it can be observed that there is a significant relationship between entrepreneurship and innovation when organizational support provided to science teachers is low [β=.106, %95CI (.019, .194), p<.001]. Similarly, when organizational support provided to science teachers is moderate, there is a significant relationship between entrepreneurship and innovation [β=.182, %95CI (.123, .240), p<.001]. Lastly, when organizational support provided to science teachers is high, there is a significant relationship between entrepreneurship and innovation [β=.258, %95CI (.186, .329), p<.001]. Likewise, when examining the beta coefficients, the perception of organizational support by teachers "low .106 moderate .182 high .258" increases positively.

Consequently, the indirect effect of entrepreneurship (X) on innovation (Y) through the mediating variable work-life balance (M) is higher when science teachers' perceptions of organizational support (W) are low, moderate, or high, indicating that in situations where organizational support is provided, the levels of entrepreneurship and innovation perception through work-life balance tend to increase further. The confidence intervals (CI) of the analysis results do not encompass zero, and in light of these findings, "H_4= There is a moderating role of organizational support in the indirect effect of entrepreneurship on innovation through work-life balance" hypothesis is supported.

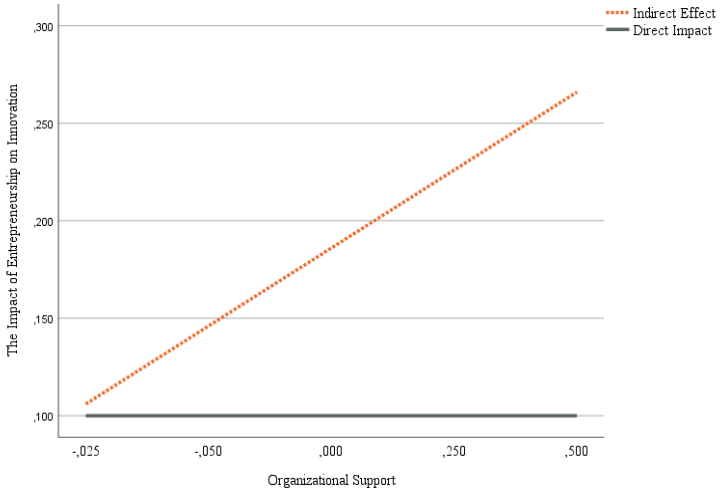

Figure 3: Graphical Representation of Moderated Mediation Effect

Discussion

In the first hypothesis of the study, the relationship between the research variables, namely entrepreneurship, innovation, work-life balance, and organizational support, was examined. The analysis revealed a positive and statistically significant relationship among these variables. The highest relationship was found to be between entrepreneurship and innovation. This finding is consistent with the results of Özgül & Yücel (2018), who found a positive and statistically significant relationship between entrepreneurship and innovation; Korkmaz & Erdoğan (2014), who found a positive and statistically significant relationship between work-life balance and organizational commitment; Turunç & Mert (2020), who found a positive and statistically significant relationship between organizational support and entrepreneurship; Çiftçi et al., (2018), who found a positive and statistically significant relationship between innovation and organizational support. These results are in line with the findings of this research. Entrepreneurship involves mobilizing resources to identify and maximize opportunities (Blake & Mestry, 2013; Norena-Chavez & Guevara, 2020; Supriyanto, 2022; Vázquez-Parra et al., 2023). Increasing teachers' roles and competencies in productivity and entrepreneurship will not only lead to the development of new ideas in schools but also pave the way for positive critical changes. This will benefit not only schools but also future generations in terms of igniting entrepreneurship in society. Individuals with a high level of innovation seek organizational support to reinforce innovative thoughts after introducing them (AlMalki & Durugbo, 2023; Cui et al., 2023; Lambriex et al., 2020; Lu et al., 2005). Organizational support encourages employees to bring forward innovative ideas (Eisenberger et al., 1986; Mehrad et al., 2020; Ridvan et al., 2020; Sumardjo & Supriadi, 2023). Supporting employees and treating them kindly also leads to successful performance. Therefore, high levels of organizational support in educational institutions imply a positive perception of the educational organization by science teachers. Praising, understanding, and supporting science teachers will yield positive outcomes for educational organizations. Furthermore, one of the important issues that modern organizations should focus on is establishing a work-life balance for their employees. Achieving work-life balance for employees translates into satisfaction and happiness, which in turn benefit the organization (Bellmann & Hübler, 2021; Rothbard et al., 2021; Saeed & Farooqi, 2014). Factors such as reasonable working hours for teachers and longer summer vacations have led to the perception of teaching as a low-status profession in society (Cinamon & Rich, 2002). However, the expected roles and responsibilities of teachers often require them to extend their time and energy from work into their personal lives, making it challenging to establish work-life balance in the teaching profession. Additionally, the school's management structure, environment, and climate can positively or negatively affect a teacher's ability to establish work-life balance.

In the second hypothesis of the study, it was concluded that the indirect effect of entrepreneurship on innovation is significant, indicating that work-life balance mediates the relationship between entrepreneurship and innovation. Work-life balance refers to an individual's control over responsibilities between their workplace, family, friends, and self. A successful work-life balance strategy increases productivity and reduces healthcare costs for employers while decreasing stress levels and increasing job satisfaction for employees (Thulasimani et al., 2010). Moreover, establishing work-life balance for employees increases organizational commitment and reduces the intention to leave the job (Wayne et al., 2017). When organizations do not consider work-life balance in favor of their employees, it can lead to employee disengagement and time-wasting behaviors during work, ultimately decreasing organizational efficiency (Korkmaz & Erdoğan, 2014). Therefore, organizations should make efforts to mitigate the negative aspects of work-life balance and foster a culture of family-friendliness. The concepts of innovation and entrepreneurship are closely related and interlinked (King & Anderson, 1995). Entrepreneurship is crucial for societal well-being and economic development in a country as it involves efficiently mobilizing resources to create new forms of production. It leads to the generation of new ideas, actions, and the emergence of new industries (Bagheri et al., 2021; Deveci, 2015; Mavi et al., 2023). Entrepreneurial teachers create value for students, parents, and society at large. They aim to produce a useful product or service while achieving their goals. Entrepreneurship, according to Aytaç (2006) and Ho et al., (2022), changes society through innovative action by initiating a change movement. In educational institutions, entrepreneurial teachers will enhance and advance the educational institution, converting the potential of education into economic activity (Syapriyuda & Santosa, 2020). In education, the concepts of innovation and innovation are often used interchangeably and share similar meanings. Education is considered a prerequisite for innovation, and innovation is considered a prerequisite for entrepreneurship. Changes in science and technology are necessary for innovation to compete with other educational institutions. According to Elçi (2007) and Halász, (2021), countries that cannot generate innovation and compete tend to lag behind economically, technologically, and socially. Therefore, teachers must adapt to a new understanding and effectively utilize technology, transferring their professional development into educational

environments (Cohan & Honigsfeld, 2011). In a rapidly changing world, countries require a skilled workforce and innovative education. Innovative education enables societies to produce generations that can respond to changing needs. Science teachers, who play a significant role in educating generations, are now obliged to be highly qualified, lifelong learners, innovative, and entrepreneurial individuals.

In the third hypothesis of the study, it was determined that entrepreneurship, organizational support, and the interaction term have significant effects on the outcome variable, work-life balance. To understand whether there is a moderating effect, the significance value of the beta value for the interaction effect variable was checked, and it was concluded that the organizational support variable has a moderating effect. Additionally, to test whether the relationship between entrepreneurship and work-life balance is significant in cases of low, medium, and high organizational support, a slope analysis graph was drawn. According to this, it was observed that the relationship between entrepreneurship and work-life balance is significant and meaningful when organizational support is low, medium, and high. Furthermore, when organizational support provided to teachers is high, the coefficient of this relationship also increases. According to Asgari et al., (2020) and Rhoades & Eisenberger (2002), voluntarily giving importance to employees will increase the level of organizational support. As a result, practices related to discretion and appreciation in the organization will also naturally bring about employees' willingness to help the organization. Meeting employees' expectations increases their perceptions of organizational support and reduces cynicism perceptions (Gökyer & Türkoğlu, 2018). Teachers are an indispensable element of educational institutions. Therefore, the success in education will be shaped by teachers. Teachers can only feel important and valuable in their institutions through organizational support provided to them (Özdemir, 2010). From another perspective, organizational support also acts as a mediator in work-family conflict (Lingard & Francis, 2006). Factors in organizations such as role conflict, role ambiguity, responsibilities, trust, management style, space, and environmental conditions affect employees' work-life balance. Factors such as increased working hours, time pressure, and job insecurity lead to the emergence of stress. Prolonged stress triggers problems such as irritability, depression, insomnia, and burnout (Keser & Gül, 2016). When employees encounter these situations, their entrepreneurial behaviors are likely to be exhausted. Entrepreneurs will have an impact on society by providing socially beneficial products and services through an innovative process, gaining a competitive advantage, and affecting society with their innovations (Akbari et al., 2021; Boons & McMeekin, 2019; Demirbilek, 2022). In a knowledge society where rapid development and transformation occur in schools, efforts should be made to nurture individuals who are open to lifelong learning, research, and production instead of daily routine work. This can only be achieved by entrepreneurial science teachers who can rapidly implement change and transformation and introduce new products.

In the fourth hypothesis of the study, it was concluded that the organizational support has a moderating role in the indirect effect of science teachers' entrepreneurship on innovation through work-life balance. To test whether the effects of entrepreneurship on innovation are significant in cases of low, medium, and high organizational support, an indirect and direct effects slope analysis graph was drawn. It was observed that the indirect effect of entrepreneurship on innovation through the mediating variable of work-life balance increases when organizational support provided to teachers is high. The significant value of the moderated mediation index also indicates that organizational support is a moderating variable in the indirect effect of entrepreneurship on innovation through work-life balance. Entrepreneurship contributes significantly to sustainability by addressing societal inequalities (Ariyani et al., 2021; Munoz & Cohen, 2017). In Turkey, the concept of "entrepreneurship" was integrated into primary education programs in 2004 as part of a reform. Subsequent updates in 2005, 2009, 2013, and 2018 added "entrepreneurship" to common basic skills and competencies. However, studies by Mutluer (2013) has found challenges in teaching "entrepreneurship" skills by teachers. This suggests that not only should the concept of "entrepreneurship" be integrated into the curriculum, but teachers should also be trained in entrepreneurship. According to Başar et al. (2013) and Taneja & Bhatia, (2022), entrepreneurs increase employment and income levels by identifying society's needs. Therefore, science teachers should be trained as successful entrepreneurs and equipped with entrepreneurial skills. In 2012, a "Collaboration Protocol for the Development of Entrepreneurship" was signed between the Ministry of National Education, the Ministry of Industry and Commerce, and TÜBİTAK to train educators and develop programs in entrepreneurship. Furthermore, the Tenth Development Plan (2014-2018) of the Ministry of Development decided to encourage entrepreneurial activities of academics and students.

Entrepreneurial individuals strive to bring about innovation by breaking out of established patterns, seeking the new, and taking risks (Demirel & Seçkin, 2008). Therefore, the concept of innovation is perceived differently for each entrepreneurial individual. Additionally, according to Drucker (2002) and Kilag et al., (2023), innovation is one of the fundamental elements of the concept of change, aiming for

sustainability and improvement alongside the phenomenon of change. Innovative individuals also possess entrepreneurial characteristics. They tend to follow innovations and have a desire to seek the new rather than sticking with what is already established. They are willing to take risks, use technology effectively, are proactive, well-educated, and can accept innovations without requiring them to be successful (Rogers, 1995). Innovation involves developing and marketing a new product or service. This concept is not just about ideas but also about putting the idea into action (Braßler & Schultze, 2021; Harhoff, 2008; Than et al., 2023; Toyirovna, 2023). When considering educational institutions, innovation can be seen as an educational institution recognizing and accepting a new idea or behavior. Organizational support reduces absenteeism among employees (Eisenberger et al., 1990; Redondo & Ladage, 2023). Organizational support is about making employees feel valued, having their back, and not feeling alone on both good and bad days. As a result, employees respond more positively by working harder when they feel that they are being supported by the organization (Turunç & Çelik, 2010). Increasing organizational support improves employee performance and job satisfaction (Rhoades & Eisenberger, 2002). In the context of educational institutions, teachers face problems such as low salaries, not getting the recognition they deserve, overcrowded classrooms, negative policy decisions affecting them, and student discipline issues (Çokluk, 2003). It's crucial for the organization to support teachers in solving these problems as it carries importance in terms of the perception of organizational support (Imran et al., 2020; Matusik et al., 2022; Özdevecioğlu, 2003). When employees perceive that they are valued, they tend to work more diligently, resulting in improved performance (Doğan, 2020). Failure to establish work-life balance in employees experiencing work-life imbalance leads to behavior problems such as a tendency towards violence, eating disorders, medication use, stress, increased alcohol and cigarette consumption. Moreover, employees may develop a sense of aggression and resort to workplace violence (Bhende et al., 2020; Rajitha & Sumathi, 2023; Sabuncuoğlu & Tüz, 2001). The inability to achieve work-life balance affects both the personal and work life of employees negatively (Jang & Zippay, 2011; Kelliher et al., 2019; Sirgy & Lee, 2018). For educational institutions, it is necessary to transform the organizational structure into one that promotes teacher collaboration, communication, knowledge exchange, and teacher entrepreneurship to reduce the problems experienced by teachers, such as excessive workload and workplace stress (Brough et al., 2020; Keser & Güler, 2016; Le et al., 2020). According to Burke (2000), most studies on teachers reveal that they tend to be workaholics. The lack of a clear relationship between the importance attributed to the teaching profession and the salary received, policy decisions, and increased student and parent problems make it difficult for teachers to maintain a work-life balance.

Conclusions and Implications

This research, it is aimed to determine the regulatory role of organizational support perceptions in the indirect effect of science teachers' entrepreneurial perceptions on innovation through work-life balance. For this purpose, "entrepreneurship, innovation, work-life balance, and organizational support" measurement tools have been applied to four hundred and one science teachers in certain districts of Istanbul. As a result of the analysis of the data obtained from the scales, certain results were reached.

The research has concluded that there are significant relationships between the perception levels of entrepreneurship, innovation, work-life balance, and organizational support among science teachers. However, the exact nature of these relationships can vary depending on various factors, and to reach a definitive conclusion based on research results, relevant studies may need to be included in a meta-analysis or meta-synthesis. Science teachers may exhibit a tendency to be innovative and entrepreneurial in delivering new and creative learning experiences to their students. This can enhance students' interest in science subjects. Having work-life balance for science teachers can improve teaching quality and boost their motivation. Good organizational support can assist science teachers in evaluating their work more positively and increase their motivation. Additionally, it has been concluded that work-life balance plays a mediating role in the impact of entrepreneurship on innovation. Entrepreneurship can provide science teachers with more control and ***flexibility, offering an opportunity to better balance work and personal life. Entrepreneurship and innovation, coupled with technological and communication advancements, can influence the balance between professional and personal life. Furthermore, it has been found that organizational support plays a regulatory role in the effect of entrepreneurship on work-life balance. The entrepreneurship of science teachers can impact work-life balance as entrepreneurs often have more freedom and flexibility. Organizational support pertains to the support, resources, and working conditions that a science teacher receives from the school or educational institution where they work. Organizational support can affect teachers' work-life balance, as a robust support system can help teachers perform their jobs more efficiently. This, in turn, can enable them to allocate more time and energy to non-work activities. Lastly, it has been concluded that organizational support plays a regulatory role in the indirect impact of***

science teachers' entrepreneurship on innovation through work-life balance. If a school encourages science teachers to share ideas and develop new approaches, science teachers in that school may be more likely to exhibit entrepreneurship and innovation. If the school provides science teachers with training and development opportunities to enhance their entrepreneurial and innovation skills, it can contribute to their success in these areas. The school's policies regarding work-life balance can facilitate science teachers in balancing their professional and personal lives, bringing more energy and motivation to their work, thereby fostering innovation. Additionally, it is essential to consider whether the school has reward and recognition systems in place for science teachers in the fields of innovation and entrepreneurship. If science teachers excel in these areas, incentive rewards or recognition mechanisms can boost their motivation.

Limitations and Recommendations

Although the research was planned to be conducted in all districts of Istanbul province, it could not be carried out in this case due to factors such as affordability and time. On the other hand, measurement tools were used ready-made in this research. However, since the research is carried out in educational institutions, mixed method research of measurement tools at the research planning stage for educational institutions, although it was intended to develop the exploratory sequential pattern with the scale development sub-pattern, this situation could not be realized. Suggestions have been made for future research aimed at this situation. The workloads of science teachers in terms of work-life balance should be meticulously organized in accordance with the necessary regulations, with a careful balance of job descriptions, authority, and responsibilities. Countries' ministries of education should give due importance to entrepreneurship among science teachers. Teachers who will teach entrepreneurship courses should be carefully selected based on their entrepreneurship competence. Financial and moral organizational support should be provided to science teachers who will teach entrepreneurship courses. Research using the variables of entrepreneurship, innovation, work-life balance, and organizational support has been conducted in disciplines other than education. Therefore, a mixed-method research design with a scale development sub-design for the exploratory sequential pattern should be developed for these scales, specifically targeting educational institutions and teachers.

Ethics Approval Statement

The ethics committee approval of this research has been obtained with the decision of Akdeniz University, Scientific Research, and Publication Ethics Committee in the Field of Social and Humanities dated 11.10.2022 and numbered 355.s

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