



Structural Model of the Effect of Psychological Capital on Innovative Behavior in Teaching: The Mediating Role of Conscientiousness Personality Trait

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Keywords:

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Purpose: The purpose of this research was to predict teachers' innovative behavior in teaching based on psychological capital with the mediating role of the conscientiousness personality trait.

Methodology: The current study is applied in terms of its goal and descriptive-correlational in terms of its method and nature. The research population consisted of female primary school teachers in the city of Rey, from whom a sample of 250 individuals was selected through the available sampling rule in structural equation modeling, and questionnaires were distributed among them through convenience sampling. The data collection tools were the standard questionnaires of Janssen's (2000) innovative behaviors in teaching, NEO's (1985) conscientiousness, and Luthans' (2007) psychological capital. The reliability of the questionnaires was confirmed by Cronbach's alpha coefficient, and their validity was confirmed through content validity. The data were analyzed using PLS software version 3.

Findings: According to the data analysis, it was shown that: Innovative behavior in teachers' teaching is predictable based on psychological capital and conscientiousness. Also, the mediating role of conscientiousness in the relationship between psychological capital and innovative behavior in teaching was confirmed.

Conclusion: It can be concluded that the adolescent-parent psychological capital is effective in predicting innovative behavior by mediating conscientiousness.

Introduction

The new century has brought waves of change with it. The environment surrounding organizations has become more dynamic than before, prompting organizations to seek answers for this dynamism and to maintain a sustainable competitive advantage (Malekzadeh, 2022). Today's organizations cannot stop the pace and speed of changes; instead, they can only convert uncertainties, fluctuations, and instabilities into opportunities for learning, adaptation, and desirable harmony (Gasper & Mbik, 2015). Education, as one of the institutional organizations that directly or indirectly trains the human resources for other organizations, is no exception to this matter. It should be noted that with such a dynamic and active environment in organizations, there is a perceived need for innovation in the organization's pillars, the most important of which are teachers (Madadi & Talebi, 2020). Innovation is the application of mental abilities to create a new thought or concept. Innovation is the employment of novel ideas stemming from creativity. In fact, innovation refers to the implementation of an idea arising from creativity presented in the form of a new product or service (Liao et al., 2015). One of the branches of innovation in teaching is innovation in teaching methods.

This concept refers to innovation in teaching methods, new educational thoughts and ideas, and the introduction and application of these ideas, with the overall goal of enhancing student learning and improving school performance (Kazory et al., 2017). Given the definition of innovation, we understand that this concept is a current need of businesses and highlights the importance of its use and attention to factors affecting it (Noor et al., 2018). One of the most important factors affecting teacher innovation is psychological capital (Khosravi, Pourshafei, & Taherpour, 2020). Psychological capital is defined as the positive feeling and general satisfaction with life in various areas such as family, job, etc. (Luthans, Youssef, & Avolio, 2017).

Some researchers believe that psychological capital can be measured through individuals' mental evaluations of their experiences; such as perceptions of emotion and spiritual well-being and objective measures like physical health guides are theories related to psychological capital (Somro & Shah, 2019).

Studies show that the higher the level of psychological capital in individuals, the more their attitude towards their job improves, and this will lead the individual to

demonstrate more innovative activities (Shackleford, Biswas, & Gotz, 2018). The personality traits of employees, as another influencing factor on innovative behavior, are themselves influenced by psychological capital (Liu, Liang, & Chang, 2021; Yilmaz et al., 2018). Pen and Liang (2019) state that conscientiousness, the inclination towards self-discipline, and striving for success against external actions or expectations are related to the way individuals control, regulate, and direct impulses, and they believe employees with conscientious personalities are more creative and inclined towards innovation (Clark et al., 2018). Employees with a conscientious personality strive to reorganize their work lives, consider all possible future outcomes, and are always seeking new experiences (Cai et al., 2015). Evidence shows that each teacher has unique personal characteristics that affect their teaching method in the classroom, their problem-solving approach, their academic exercise style, and ultimately their success in teaching (Ganji et al., 2012). Numerous empirical studies have also shown a significant relationship between personality types and the inclination towards innovation; although, some studies have not observed a significant relationship between these two variables (Delaviz et al., 2019).

The field of education, due to its importance, role, and impact, is worth contemplation and examination from various angles. A wide range of the country's population consists of youths and future builders who span from kindergarten to higher university levels. This inherently increases the responsibility of the education system towards expanding and implementing innovation in education (Ghasemi, 2020). Thus, innovation in the field of education is a comprehensive, vast, and impactful subject that, if correctly understood and managed, can play a role in all issues of education that are contingent on the components of the educational system (Azizi et al., 2019). Available literature shows that numerous studies have been conducted on the role of factors affecting employee innovation in various businesses, but no study was found that has addressed the prediction of innovative behavior in teachers' teaching based on psychological capital with the mediating role of the conscientiousness personality trait. Moreover, the main issue in most service organizations, especially educational institutions within the country, is that the managers of these organizations are unaware of the significant role of employees and

human resources in the success of the organization and pay little attention to this valuable aspect of human resources. Therefore, in this research, we seek to answer the fundamental question of what impact does psychological capital have on innovative behavior in teaching with the mediating role of the conscientiousness personality trait?

Methods and Materials

The present research is applied in terms of its objective. Regarding its method and nature, it is classified as a descriptive-correlational study. The research population consisted of female primary school teachers in the city of Rey. There is no general consensus on the required sample size for structural equation models, but many researchers claim that the minimum sample size needed for this purpose is 200 samples. In this study, the researcher collected and analyzed 250 questionnaires. The sampling method was convenience sampling. Structural equation modeling and PLS software version 3 were used for data analysis. The data collection tools were the following standard questionnaires:

NEO Five-Factor Personality Inventory: The NEO five-factor test has universal applications and has been translated into Czech, Arabic, Dutch, French, German, Japanese, Norwegian, Polish, and Swedish for research purposes. The NEO-FFI personality questionnaire was administered by McCrae and Costa to 208 American students with a three-month interval, achieving reliability coefficients ranging from 0.83 to 0.75. Each factor comprises six facets, with Cronbach's alpha coefficients obtained for the main factors of neuroticism, extraversion, openness, agreeableness, and conscientiousness being 0.86, 0.73, 0.56, 0.68, and 0.87, respectively. To assess the content validity of this test, the correlation between the self-report form and the observer assessment form was used, with the maximum correlation being 0.66 in the extraversion

factor and the minimum being 0.45 in the agreeableness factor. (In the current study, and considering its objectives, questions related to the conscientiousness personality trait were used)

Psychological Capital Questionnaire: Designed by Luthans (2007), this questionnaire consists of 24 items and four components: hope, resilience, optimism, and self-efficacy, with six items each. It is measured on a five-point Likert scale with questions like (I confidently analyze a long problem to find a solution.). The validity of the questionnaire has been confirmed in various studies. Luthans (2007) reported a chi-square of 24.6 for this test, with CFI and RMSEA statistics of the model being 0.97 and 0.08, respectively, confirming the factorial validity of the test. The reliability of the questionnaire in Iran was reported by Bahadori Khosroshahi et al. (2012) based on Cronbach's alpha as 0.85.

Innovation Standard Innovation in Teaching Questionnaire: Developed by Janssen (2000) based on the model developed by Scott and Bruce to measure innovation in teaching among teachers. This questionnaire has 9 questions and three components: idea generation, idea promotion, and idea realization, and assesses teachers' organizational innovation on a five-point Likert scale. In the research by Ahmadi and colleagues (2016), the content, face, and criterion validity of this questionnaire was appropriately assessed. The Cronbach's alpha coefficient calculated in the research by Ahmadi and colleagues (2016) for this questionnaire was estimated to be above 0.7.

Findings

After ensuring the homogeneity of the statistical sample in terms of demographic characteristics, the descriptive characteristics of the research variables are presented in the table below.

Table 1. Descriptive Statistics of Research Variables

Variable	Mean	SD	Skewness	Kurtosis	Min	Max
Conscientiousness Personality	3.42	0.687	-0.259	-0.507	1.50	4.83
Hope	3.62	0.940	-0.491	-0.413	1.33	5.00
Resilience	3.76	0.816	-0.760	-0.148	1.50	5.00
Optimism	3.56	0.816	-0.198	-1.111	1.83	5.00
Self-efficacy	3.53	0.655	-0.559	0.228	1.67	5.00

Psychological Capital	3.62	0.611	-0.441	-0.475	2.00	4.63
Idea Generation	3.60	0.852	-0.304	-0.540	1.67	5.00
Idea Promotion	3.62	0.864	-0.239	-0.763	1.67	5.00
Idea Realization	3.48	0.941	-0.522	-0.415	1.00	5.00
Innovative Behavior	3.57	0.762	-0.377	-0.605	1.67	5.00

According to Table 1, among the research variables, resilience scored the highest with a mean of 3.76 and a standard deviation of 0.816, while the conscientiousness

personality trait scored the lowest with a mean of 3.42 and a standard deviation of 0.687.

Table 2. Results of the Kolmogorov-Smirnov Test for Research Indices

Index	Statistics	p	Results
Conscientiousness Personality	352.0	001.0	Normality Rejected
Psychological Capital	255.0	001.0	Normality Rejected
Innovative Behavior	412.0	001.0	Normality Rejected

As indicated by the data in Table 2, the significance level of the Kolmogorov-Smirnov test for the research indices is less than 0.05. Therefore, the research indices have a

non-normal distribution. Consequently, PLS software has been used for data analysis.

Table 3. Factor Loadings, Significance Statistics, Cronbach's Alpha, Composite Reliability, and AVE for the Research Questionnaire

Variable	Item	Factor Loading	t	AVE	Composite Reliability	Cronbach's Alpha
Conscientiousness Personality	Q01	0.761	19.149	524.0	929.0	915.0
	Q02	0.787	26.067			
	Q03	0.821	34.532			
	Q04	0.792	30.538			
	Q05	0.742	22.108			
	Q06	0.762	22.306			
	Q07	0.789	29.757			
	Q08	0.560	10.987			
	Q09	0.581	13.116			
	Q10	0.698	17.973			

	Q1 1	0.659	15.038			
	Q1 2	0.677	14.609			
Hope	Q1 3	0.882	50.715			
	Q1 4	0.901	66.864			
	Q1 5	0.895	64.921	770.	953.0	940.0
	Q1 6	0.860	33.918	0		
	Q1 7	0.864	32.932			
	Q1 8	0.863	42.195			
	Q1 9	0.759	25.904			
	Hope	Q2 0	0.852	45.079		
Q2 1		0.839	45.907	645.	916.0	890.0
Q2 2		0.814	33.154	0		
Q2 3		0.765	27.174			
Q2 4		0.785	30.629			
Q2 5		0.689	16.578			
Hope	Q2 6	0.813	32.570			
	Q2 7	0.931	122.537	678.	926.0	902.0
	Q2 8	0.891	79.564	0		
	Q2 9	0.849	49.486			
	Q3 0	0.742	24.251			
	Q3 1	0.783	24.599			
Self-efficacy	Q3 2	0.789	21.714	604.	901.0	866.0
	Q3 3	0.773	26.984	0		
	Q3 4	0.864	45.424			

	Q3 5	0.815	34.600			
	Q3 6	0.617	10.992			
Idea Generation	Q3 7	0.788	25.763	715. 0	883.0	800.0
	Q3 8	0.887	53.061			
	Q3 9	0.860	50.295			
Idea Promotion	Q4 0	0.891	57.101	703. 0	875.0	782.0
	Q4 1	0.906	98.768			
	Q4 2	0.704	18.040			
Idea Realization	Q4 3	0.893	54.292	815. 0	929.0	886.0
	Q4 4	0.904	76.202			
	Q4 5	0.910	65.957			

The confirmatory factor analysis of the questionnaire items is presented in Table 3. To evaluate the model, this study utilized factor loadings, composite reliability, and the average variance extracted, examining the square root of the average variance extracted of the constructs with the construct correlations. To achieve

convergent validity and correlation levels, composite reliability tests and average variance were evaluated. As shown in Table 3, the factor loading for no item is less than 0.5. Therefore, no item has been excluded from the analysis.

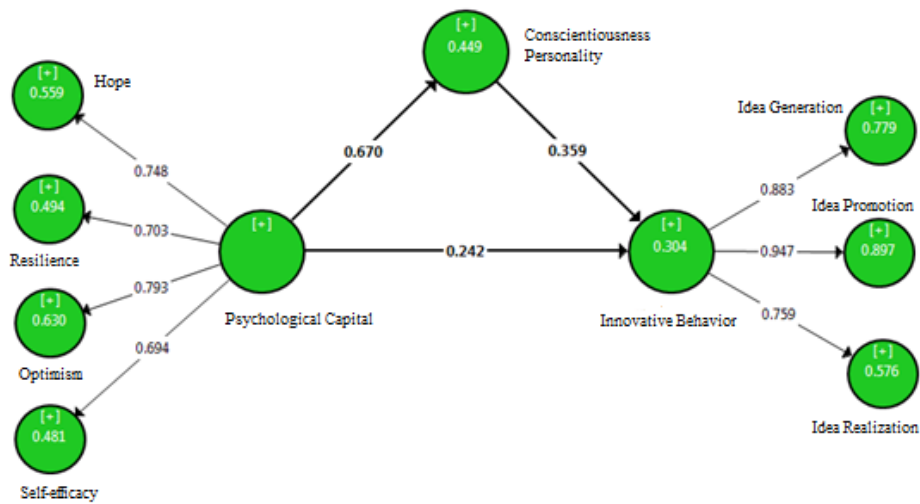


Figure 1. Model with Path Coefficient

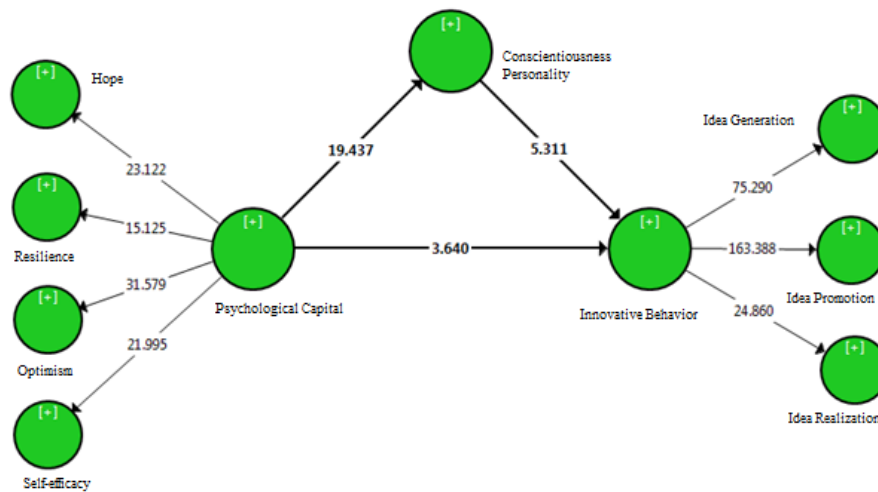


Figure 2. Model with T-Values

Table 4. Results from the Structural Model Evaluation for Testing Research Hypotheses (Examination of Direct Relationships)

Row	Path	Path Coefficient (β)	T-value	Results
1	Psychological Capital to Innovative Behavior	242.0	640.3	Approved
2	Psychological Capital to Conscientiousness Personality	670.0	437.19	Approved
3	Conscientiousness Personality to Innovative Behavior	359.0	311.5	Approved

After examining the measurement model, it is time to review and test the structural model of the research. The graphical output of the research model is as follows. The numbers written on the paths represent the path coefficients. To test the significance of path coefficients, t-values were calculated using the bootstrap method. If a t-value is greater than 1.96, the path coefficient is significant at the 0.05 level.

For testing the hypothesis related to the mediating role of conscientiousness, the bootstrap method was used. In this method, if both the lower and upper limits of the bootstrap are positive or both are negative, and zero does not lie between these two limits, then the indirect path is significant, and the hypothesis will be accepted. Also, if the significance level is less than 0.05, the indirect effect is accepted. Based on this index, the significance or non-significance of the indirect path is presented in Table 5:

Table 5. Results from the Bootstrap Method for Testing the Significance of the Indirect Effect

Independent Variable	Path	Mediating Variable	Dependent Variable	Indirect Effect	Bootstrap		t	Error	p
					Upper Bound	Lower Bound			
Psychological Capital		Conscientiousness Personality	Innovative Behavior	241.0	342.0	146.0	947.4	049.0	001.0

According to Table 5, the significance level is 0.001, which is less than 0.05, and the confidence interval does not include zero. Therefore, the research hypothesis is accepted. This means that conscientiousness personality plays a mediating role in the effect of psychological capital on innovative behavior in teaching among teachers.

Conclusion

The results of the research data analysis showed that teachers' innovative behavior in teaching can be predicted based on psychological capital. Specifically, as the level of teachers' psychological capital increases, their innovation improves. Therefore, the mentioned hypothesis was confirmed. The result obtained in this hypothesis is consistent with the findings of Khosravi et al. (2020). The results of these researchers also indicated that psychological capital leads to improved innovative behaviors among employees. As mentioned in the research literature, psychological capital consists of positive feelings and general satisfaction with life in various areas such as family, job, etc. In other words, psychological capitals include a set of characteristics, skills, and cognitive resources that individuals use to face challenges, regulate emotions, solve problems, and improve their performance. Thus, it can be explained that teachers with a high level of psychological capital have more job motivation, and this motivation stimulates teachers to seek new and creative ways to convey content and employ diverse methods to engage and encourage students. Furthermore, teachers with high psychological capital are able to effectively communicate with their students and pay attention to their needs and interests. These effective and empathetic communications make students feel connected and valued, and they easily discuss innovative ideas and solutions with their teachers. The results from the data analysis showed that teachers' innovative behavior in teaching can be predicted based on the conscientiousness personality trait. The higher the level of teachers' conscientiousness, the better their innovative behavior in teaching improves. The results from the data analysis also showed that the conscientiousness personality trait of teachers can be predicted based on psychological capital. The result obtained in this hypothesis aligns with the findings of several studies. These effective communications can enhance personality traits such as cooperation, respect, and interpersonal understanding. The influence of psychological capital on innovative behavior in teaching, particularly the mediating role of conscientiousness personality traits, has been a subject of interest in various studies. Psychological capital, which encompasses positive psychological states such as hope, self-efficacy,

optimism, and resilience, has been found to play a significant role in influencing innovative work behavior (Ziyae et al., 2015; Mridul & Sharma, 2021). Additionally, it has been observed that psychological capital can mediate the relationship between work-to-family enrichment, family-to-work enrichment, and innovative work behavior (Mishra et al., 2017). Furthermore, the impact of psychological capital on employees' innovative behavior has been investigated in the context of small and medium enterprises (SMEs) (Alshebami, 2021). The study found that psychological capital influences employees' innovative behavior through the mediating effect of employees' job satisfaction and innovative intention. Moreover, psychological capital has been identified as a mediator for the relationship between authentic leadership style and innovative work behavior (Novitasari et al., 2020).

Conscientiousness personality traits have been linked to innovative behavior, and the mediating effect of psychological capital on ethical leadership and service innovation behavior has been highlighted as an area for further exploration (Özsungur, 2019). Furthermore, the influence of psychological capital on breakthrough innovation performance has been studied, with knowledge sharing identified as a mediating factor (Liu et al., 2023). In the context of leadership, it has been found that leaders' psychological capital can have a significant positive effect on the innovation behavior of employees directly, and it can also have an indirect positive effect on the innovation behavior of employees by maintaining high-quality leader-member exchange (LMX) (Li et al., 2020).

In the entrepreneurial context, the psychological capital of enterprise leaders has been found to be positively correlated with innovation behaviors, with specific elements of psychological capital playing a mediating role (Chen & Tao, 2021). Additionally, the psychological capital of entrepreneurial teams has been shown to have a significant positive effect on the innovation performance of startups, with knowledge sharing and knowledge hiding playing a partially mediating role (Chen et al., 2023). The influence of psychological capital on employees' innovative behavior has also been explored in the context of e-leadership, with psychological capital and affective commitment to leadership identified as mediating factors (Li & Xiao, 2023). Moreover, psychological capital has been found to have a positive and statistically significant effect on the ethical behavior of teachers in the higher educational sector (Rehman et al., 2018).

In summary, the literature suggests that psychological capital plays a crucial role in influencing innovative behavior, with its mediating effects on various factors

such as leadership, knowledge sharing, and ethical behavior being of particular interest.

It is necessary to mention that the current research had limitations, such as being cross-sectional, and there is a need for longitudinal studies to examine the relationships present in this research. Also, this study was limited to female primary school teachers in the city of Rey, so caution is needed when generalizing the results to other individuals and age groups. It is suggested that, given the importance of the subject and to achieve more generalizable results, similar research be conducted in other regions of the country, in different educational levels, and with a larger sample size. Finally, given the results obtained, it is recommended to the authorities of the education system: Schools and educational authorities should organize workshops and classes to teach issues related to psychological capital and to strengthen self-esteem, respect for personality, and create a sense of satisfaction in various areas for teachers to provide the necessary conditions for their inclination towards innovative activities and the proper performance of responsibilities and duties. Teachers should also not forget to seek counseling to increase their level of psychological capital and general positive feelings and satisfaction with life in various areas. Always, they should cultivate the attitude that they are capable of managing their affairs in the best way possible. Given the direct and indirect impact of the conscientiousness personality trait on innovative behaviors in teaching, offering encouragement and rewards for teachers can increase their motivation and sense of responsibility. This could include public recognition, career advancement, financial rewards, or attractive professional opportunities. Additionally, education authorities should pay attention to teachers' time productivity and arrange tasks and activities in a way that allows teachers to manage their time appropriately.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethics principles

In this study, ethical considerations such as obtaining full consent from all participants, maintaining confidentiality and secrecy of information, and allowing participants to withdraw from study.

Authors' Contributions

All authors contributed equally.

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