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The mediating role of schools as learning institutions in the relationship between psychological capital and innovative behavior among preschool teachers in West Hararghe Zone, Ethiopia

Assefa Kibret

assefakibret59@gmail.com

Oda Bultum University

Dr. Mohammed Gobeze

Oda Bultum University

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Abstract

The current study aimed to investigate the mediating role of schools as learning institutions in the relationship between psychological capital and innovative behavior among preschool teachers in West Hararghe Zone, Ethiopia. The primary objective was to determine whether schools significantly mediate the connection between psychological capital and innovative behavior among preschool teachers of West Hararge Zone. The research design employed was a mixed-methods approach, specifically an explanatory sequential research design. Descriptive statistics mainly percentage and frequency were used to summarize the demographic characteristics of the study participants. The study used mediation analysis, incorporating regression coefficients and the Sobel test to assess the indirect effect of psychological capital on innovative behavior through the mediating role of schools. The study's key research questions in this regard were: 1) What is the demographic profile of the pre-school teachers in the West Hararghe Zone, in terms of gender, age, education level, and years of teaching experience? 2) What are the mean scores of psychological capital and teachers' innovative behavior in the West Hararghe Zone pre-schools? and 3) Do schools significantly mediate the relationship between psychological capital and teachers' innovative behavior in preschools of the West Hararghe Zone towns administration? The study included 222 preschool teachers from selected schools in the towns administration of West Hararghe Zone. These teachers were selected using a combination of stratified random sampling and purposive sampling. The mediation analysis revealed that schools significantly mediate the relationship between psychological capital and innovative behavior, suggesting that a supportive school environment enhances the influence of teachers' psychological capital on their innovative practices in the classroom.

Innovative Behavior

Innovative behavior refers to an individual's effort to generate, introduce, and implement new ideas, strategies, and technologies that enhance the efficiency and effectiveness of the education. system [6]. It is a multi-stage process involving idea formation, promotion, and implementation. Innovative behavior in the education sector involves finding alternative ways to improve teaching and learning processes, implementing new strategies, adopting new technologies, and creating an environment that fosters student engagement and success. According to Amoozegar [3], innovative behavior is a behavioral approach that includes social, organizational, motivational, and psychological processes to enhance teachers' effectiveness. The key indicators of innovative behavior include exploring, developing, promoting, and implementing new ideas that contribute to improving students' learning quality.

Research has shown that teachers' innovative behavior positively affects student achievement and overall institutional success [17]. Preschool teachers play a crucial role in shaping children's learning experiences, making their innovative behavior a key factor in improving education quality. Effective teachers influence students not only through their innovative strategies but also by fostering creativity in the learning process. Furthermore, an innovative learning atmosphere enhances children's interest in education and improves academic outcomes [1]. Given the important role of teachers in promoting

school change and improvement, their innovative behavior is particularly critical in the early stages of education.

Several factors influence preschool teachers' innovative behavior, with psychological capital and school as a learning institution being among the most significant [16]. Research indicates that schools directly affect teachers' innovative behavior by fostering a supportive learning environment. Schools that operate as learning organizations provide structures that encourage continuous learning, knowledge sharing, and collaboration. According to Rahmadani, Schaufeli and Stouten [12], a school as a learning institution consists of three fundamental elements: a supportive learning environment, concrete learning processes, and effective leadership behaviors. These elements promote ongoing learning, encourage dialogue and teamwork, and create a vision that empowers teachers. The seven dimensions of a learning organization continuous learning, inquiry and dialogue, team learning, embedded systems, empowerment, system connection, and strategic leadership should be embedded within school culture to enhance teachers' innovative behavior [4].

Preschool teachers' innovative behavior is commonly conceptualized as having three dimensions: idea generation, idea promotion, and idea realization. Research highlights that creativity is a significant component of teachers' innovative behavior, particularly in early childhood education. Since preschool teachers' innovative behavior significantly impacts children's learning quality and school success, fostering innovation should be a key priority in early education settings .

Another critical factor influencing teachers' innovative behavior is psychological capital, which is defined as an individual's positive psychological state characterized by four elements: hope, self-efficacy, resilience, and optimism [10]. Hope involves setting and pursuing meaningful goals, self-efficacy refers to individuals' confidence in their ability to succeed, resilience is the capacity to recover from setbacks, and optimism is a positive outlook on future success. These psychological attributes help teachers remain motivated, adaptable, and open to implementing innovative teaching strategies [13]. Research has shown that teachers with high psychological capital are more likely to engage in innovative behavior and contribute to school improvement efforts.

Despite efforts by the government and private institutions to expand preschool education, little attention has been given to assessing how schools influence children's overall learning quality through the psychological capital and innovative behavior of preschool teachers. Recent research underscores that children's learning outcomes at the preschool level are directly linked to teachers' effectiveness and innovative teaching methods [10]. A recent study by the Rise Ethiopia Research Group (2022) found that 68% of grade 2 students and 51% of grade 3 students cannot read and write, highlighting the urgent need for improvements in early childhood education. Among the many contributing factors, psychological capital and school as a learning institution appear to play a crucial role in shaping preschool teachers' innovative behavior, which directly affects children's learning quality.

However, there is a significant gap in understanding the extent to which schools mediate the relationship between psychological capital and teachers' innovative behavior in preschools. While existing literature

acknowledges the importance of both factors, there is limited empirical evidence on how schools influence the link between teachers' psychological capital and their capacity for innovation. Addressing this gap is critical because preschool education lays the foundation for children's future learning experiences. Given these concerns, this study aims to examine the extent to which a school as a learning institution mediates the relationship between psychological capital and preschool teachers' innovative behavior. By focusing on this mediation, the study seeks to provide valuable insights into how school environments can foster innovation among teachers, ultimately improving children's learning experiences and overall educational outcomes.

The following basic research questions were formulated:

1. What is the demographic profile of the pre-school teachers in the West Hararge Zone, in terms of gender, age, education level, and years of teaching experience?
2. What are the mean scores of psychological capital and teachers' innovative behavior in the West Hararge Zone pre-schools?
3. Do schools significantly mediate the association between psychological capital and teachers' innovative behavior in pre-schools of West Hararge Zone towns' administration?

Literature review

Innovative Behavior and Its Role in Education

Innovative behavior involves generating, introducing, or applying new ideas that enhance teaching and learning at all levels [6]. It is a multi-stage process encompassing idea formation, development, and implementation [10]. Teachers demonstrating innovative behavior explore, develop, and promote new ideas while integrating advanced strategies and technologies. Such behavior enhances teacher performance and contributes to an effective education system [13].

School leadership plays a crucial role in fostering innovative behavior by encouraging goal achievement, providing direction, and promoting risk-taking. Learning organizations, characterized by continuous learning, openness to change, and collaborative problem-solving, further support teachers' innovative behavior [2]. Given the increasing demands of a knowledge-driven society, fostering teacher innovation is essential for sustaining educational success.

Concept of Psychological Capital

Psychological capital is a positive psychological state comprising self-efficacy, hope, optimism, and resilience [10]. Self-efficacy refers to confidence in one's ability to achieve goals [13]. Hope involves goal-directed determination and planning strategies that enable individuals to pursue desired outcomes effectively [8]. Optimism reflects a tendency to expect positive outcomes and maintain a positive outlook toward future success [14]. Resilience is the ability to recover from adversity and adapt to challenges.

Psychological capital enhances work performance and promotes innovation by equipping individuals with the motivation and confidence to navigate challenges effectively [10]. By integrating psychological capital with a supportive school environment, teachers are more likely to engage in innovative behaviors that improve the overall quality of education.

Methodology

A mixed research approach, particularly the **explanatory sequential research design**, was used because the researchers collected quantitative and qualitative data sequentially in two phases. The researchers emphasized quantitative data in the first phase of the study, followed by qualitative data in the second phase. The rationale for using this research approach is that the quantitative data and their analysis provide a general understanding of the research problem. The qualitative data and their analysis then refine and explain those statistical results by exploring participants' views in more depth [5].

Participants

The study targeted pre-schools in the West Hararge Zone towns' administration, comprising 50 pre-schools with a total of 500 teachers. Systematic sampling was used to select pre-schools. The sample size was determined using Yamane's formula at a 95% confidence level (P = 0.5) [18], yielding a required sample of 222 teachers (133 female, 89 male). Stratified random, cluster, and purposive sampling techniques were employed. First, pre-schools were categorized into public and private clusters. Then, stratified random sampling based on gender was used to select participants.

Data Collection Instruments

The primary data collection instrument was a questionnaire. The quantitative phase utilized validated scales to measure psychological capital, school as a learning organization, and innovative behavior. The innovative behavior scale (17 items) was adapted from a previous study [7], covering idea generation (5 items), idea promotion (6 items), and idea implementation (6 items). Psychological capital (24 items) was measured using an established scale [8], assessing hope, self-efficacy, resilience, and optimism (6 items each). The school as a learning organization scale (21 items) was adapted from a recognized framework [9], covering continuous learning, inquiry and dialogue, embedded systems, team learning, empowerment, system connection, and strategic leadership (3 items each). Reliability (Cronbach's alpha) and face validity were thoroughly assessed.

Data Analysis

For the mediation analysis, the study utilized Sobel test and bivariate regression coefficients to examine the mediating role of school as a learning organization in the relationship between psychological capital and innovative behavior of pre-school teachers. Specifically, the analysis aimed to assess whether

school as a learning organization served as a mediator in the association between the psychological capital dimensions (self-efficacy, hope, optimism, and resilience) and the innovative behavior of pre-school teachers.

Mediation analysis is essential to understand how the relationship between psychological capital and innovative behavior is influenced by the school environment. The Sobel test was used to assess the significance of the indirect effect, while the bivariate regression coefficients allowed for the examination of the direct and indirect paths between the variables. This approach provided insights into whether school characteristics, such as leadership, learning culture, and system connections, act as intervening factors that enhance or diminish the impact of psychological capital on teachers' innovative behavior.

Results

Socio demographic data of the participants

Table 1
Pre-school teachers' participants by sex, age and services year in pre-school (N = 222).

Sex of teachers			Age of teachers				Teaching Experiences (Yrs)		
Gender	F	%	Min	Max	Mean	SD	Experience	F	%
Male	89	40.1	20	45	32.5	2.53	1–5	123	55.0
							6–10	80	36.0
Female	133	59.9	19	24	21.5	1.45	> 10	19	9.0
Total	222	100				2.14	Total	222	100

In Table 1, provides the socio-demographic characteristics of the pre-school teacher participants, including gender, age, and teaching experience. There are 89 male teachers, comprising 40.1% of the total sample & 133 female teachers, comprising 59.9% of the total sample. The male teachers' ages range from 20 to 45 years, with a mean age of 32.5 years and a standard deviation (SD) of 2.53 years while female teachers' ages range from 19 to 24 years, with a mean age of 21.5 years and a standard deviation (SD) of 1.45 years. The total teaching experience for all participants ranges from 1 to more than 10 years. A majority (55%) of teachers have between 1 and 5 years of experience.

Table 2
Descriptive statistics on teachers' preferences of psychological capital & innovative behavior (N = 222).

Variables	Mean	SD
Psychological capital	4.04	22.27
Hope	4.49	9.13
Self-efficacy	4.47	10.36
Resilience	3.68	16.29
Optimism	3.50	15.50
Innovative behavior	4.33	25.41
Idea generation	4.46	6.59
Idea promotion	4.31	17.36
Idea implementation	4.21	8.50

As can be observed from Table 2, regarding psychological capital, mean: 4.04, indicating a moderate level of psychological capital among the preschool teachers while SD: 22.27, which is unusually high and may indicate a high level of variability or inconsistency in the responses regarding psychological capital. In relation with innovative behavior, mean: 4.33, indicating that overall, teachers tend to engage in innovative behavior at a moderately high level while SD: 25.41, a very high value, which suggests significant variation in how teachers engage in innovative behavior.

These descriptive findings show that the teachers' perceptions of psychological capital and innovative behavior are moderately positive, with higher scores in hope, self-efficacy, and idea generation compared to resilience, optimism, and idea implementation. However, the high standard deviations across most variables indicate significant variability in how individual teachers perceive and engage in these behaviors. This suggests that some teachers feel more empowered or optimistic, while others may have a lower perception of their capabilities or innovative behaviors.

Mediation analysis

As clearly indicated in Fig. 1, mediation model, the mediation analysis highlighted a clear and interconnected pathway showing how psychological capital shapes the innovative behavior of preschool teachers, particularly through the supportive functions of a school that operates as a learning institution. The findings showed a mix of significant direct and indirect effects, with most coefficients falling within small to moderate ranges. These patterns suggest that when teachers possess higher levels of psychological capital, they are more likely to demonstrate innovative practices, not only on their own but also because the school environment reinforces and channels this positive psychological state in meaningful ways.

The total influence between the independent variable (psychological capital) and the dependent variable (teachers' innovative behavior) in preschools was assessed through mediational analysis. The results of this analysis indicated in Fig. 1, that the total effect between psychological capital and teachers' innovative behavior in the preschools of West Hararghe Zone was statistically significant, with a p-value less than .05 ($p < .05$). Thus, the pathways from psychological capital (hope, self-efficacy, resilience, and optimism) to preschool teachers' innovative behavior were all connected.

More specifically, the results revealed a statistically significant direct effect between hope and teachers' innovative behavior (unstandardized coefficient beta = .02, standard error = .01, $p = .000$), between self-efficacy and optimism and teachers' innovative behavior (unstandardized coefficient beta = .04, standard error = .01, $p = .000$), and between resilience and teachers' innovative behavior (unstandardized coefficient beta = .13, standard error = .10, $p = .000$). In all these cases, the p-values were less than .05, indicating statistical significance. Therefore, for all the sub-dimensions of psychological capital considered in this study, the pathways from hope, self-efficacy, optimism, and resilience to teachers' innovative behavior were directly connected, showing a direct effect between the variables.

Regarding the school as a mediator variable, the findings also indicated that there was a statistically significant direct effect between the mediator variables (team learning, continuous learning, embedded systems, empowerment, system connection, and strategic leadership) and teachers' innovative behavior in the preschools of West Hararge Zone. All components of the school as a learning institution had a p-value of .000, indicating statistical significance, as these values were all less than the alpha value of .05 ($p < .05$)

To further analyze the statistical significance of the indirect effect between psychological capital and teachers' innovative behavior via school as a learning organization, the researchers used the Sobel test [15]. The Sobel test examines whether the relationship between the independent and dependent variables is mediated by a third variable. In other words, it tests whether the inclusion of a mediator (M) in the regression analysis significantly reduces the effect of the independent variable on the dependent variable [11]. Additionally, the Sobel test evaluates whether a mediator variable transmits the influence of an independent variable to a dependent variable.

Table 3
Sobel test results of the indirect influence between psychological capital and pre-school teachers' innovative behavior (N = 222).

Variables	Sobel test statistics (t)	Effect size	Standard error	P/sig-value
Indirect effect of hope via continues learning & connection system	7.82	.10	.01	.000
Indirect effect of hope via team learning & empowerment	7.20	.09	.01	.000
Indirect effect of hope via system connection & strategic leadership	-2.72	− .03	.01	.006
Indirect effect of self-efficacy & optimism via continues learning & connection system	9.06	.04	.00	.000
Indirect effect of self-efficacy & optimism via team learning & empowerment	7.20	.03	.01	.000
Indirect effect of self-efficacy & optimism via system connection & strategic leadership	− .1.93	− .01	.03	.050
Indirect effect of resilience via continues learning & connection system	8.34	.07	.01	.008
Indirect effect of resilience via team learning & empowerment	7.19	.06	.01	.000
Indirect effect of resilience via system connection & strategic leadership	6.65	− .01	.01	.330
**P < 0.05*				

Results from the above Table 3, indicated that the indirect effect of hope via continuous learning and connection system has a Sobel test statistic (t) of 7.82, with an effect size of .10, a standard error of .01, and a highly significant p-value of .000. This suggests a strong and statistically significant indirect influence of hope on teachers' innovative behavior through this mediator. Similarly, the indirect effect of hope via team learning and empowerment also shows a significant Sobel test statistic of 7.20, with an effect size of .09, a standard error of .01, and a p-value of .000, indicating a statistically significant indirect influence.

However, the indirect effect of hope via system connection and strategic leadership has a negative Sobel test statistic (-2.72), with an effect size of − .03, standard error of .01, and a p-value of .006, suggesting that this mediation effect is small but statistically significant in the opposite direction.

On the other hand, the indirect effect of self-efficacy and optimism via continuous learning and connection system has a very high Sobel test statistic (9.06), with a small effect size of .04, a standard error of .00, and a highly significant p-value of .000, indicating a strong positive mediation effect. Similarly, self-efficacy and optimism via team learning and empowerment has a Sobel test statistic of

7.20, an effect size of .03, and a significant p-value of .000, indicating a significant positive mediation effect. The indirect effect of self-efficacy and optimism via system connection and strategic leadership is negative, with a Sobel test statistic of -1.93, an effect size of − .01, standard error of .03, and a p-value of .050. While the effect is weak and slightly negative, it is statistically significant at the conventional .05 level.

The indirect effect of resilience via continuous learning and connection system has a Sobel test statistic of 8.34, with an effect size of .07, a standard error of .01, and a p-value of .008, indicating a significant positive indirect influence. Resilience via team learning and empowerment has a Sobel test statistic of 7.19, effect size of .06, standard error of .01, and a p-value of .000, showing another significant positive mediation effect. Finally, the indirect effect of resilience via system connection and strategic leadership shows a negative Sobel test statistic (-6.65), effect size of − .01, standard error of .01, and a non-significant p-value of .330, indicating that this mediation effect is not statistically significant.

Several mediation effects are statistically significant, suggesting that hope, self-efficacy and optimism, and resilience influence preschool teachers' innovative behavior through various school components (like continuous learning, team learning, and empowerment) while some mediations (especially involving system connection and strategic leadership) show weaker or negative effects, with some statistically insignificant results (e.g., resilience via system connection and strategic leadership, self-efficacy and optimism via system connection). The p-values that are less than 0.05 indicate statistical significance, while those greater than 0.05 suggest no significant indirect effect.

Discussions

The results of the mediation analysis highlight the significant indirect effects of psychological capital (hope, self-efficacy, optimism, and resilience) on preschool teachers' innovative behavior, mediated by various school learning and leadership components. Hope demonstrated a robust and significant indirect effect on innovative behavior through continuous learning and system connection, as well as team learning and empowerment. These findings suggest that teachers’ hope, when supported by school structures that promote learning and collaboration, positively influences their innovative behaviors. However, the negative indirect effect observed through system connection and strategic leadership indicates that the relationship may be more complex in certain contexts, warranting further investigation.

Self-efficacy and optimism showed similarly strong indirect effects, particularly through continuous learning and connection systems. This underscores the importance of fostering teachers' belief in their capabilities and promoting a positive outlook, which are critical for encouraging innovation. Although the mediation effect through system connection and strategic leadership was statistically significant, it was weak and negative, suggesting that in certain environments, these factors may hinder, rather than support, innovative behavior.

Resilience was also found to significantly mediate the relationship between psychological capital and innovative behavior, particularly through continuous learning and team empowerment. These results

imply that resilience enables teachers to cope with challenges and stay motivated, thereby enhancing their capacity for innovative practices. However, the indirect effect through system connection and strategic leadership was not significant, suggesting that in some cases, these leadership elements may not play a critical role in fostering resilience-driven innovation.

In conclusion, the mediation analysis emphasizes the importance of creating supportive school environments, particularly those that enhance learning, collaboration, and empowerment. However, the mixed results involving system connection and strategic leadership suggest that these factors might need to be more carefully tailored to effectively support teachers' psychological capital in promoting innovation. Further research is needed to explore these complexities and refine strategies to optimize the relationship between psychological capital and innovative behavior in educational settings.

Conclusion

The mediational analysis revealed that psychological capital significantly influences preschool teachers' innovative behavior, with school as a learning organization serving as a key mediator. Hope, self-efficacy, optimism, and resilience were found to have strong indirect effects on innovative behavior, particularly when mediated by school structures such as continuous learning, team learning, empowerment, and system connection. These effects were more pronounced for female teachers, indicating that they benefit more from collaborative and empowering school environments. For male teachers, the mediation effects were generally weaker but still significant, particularly through system connection and resilience.

Overall, the findings highlight the importance of fostering supportive school environments that enhance teachers' psychological capital to encourage innovation. Gender differences in the mediating effects suggest the need for tailored strategies to optimize school structures for both male and female teachers. Further research could explore these dynamics in greater depth to refine educational strategies and improve innovative practices in preschool settings.

Recommendation

Enhance School Learning Structures: Schools should focus on strengthening collaborative learning, empowerment, and system connection to support teachers' psychological capital, fostering a conducive environment for innovative behavior.

Tailored Gender-Specific Strategies: Given the gender differences in the mediation effects, schools should consider implementing targeted interventions that cater to the specific needs of female and male teachers, with a focus on empowerment for female teachers and resilience-building for male teachers.

Promote Psychological Capital: Programs aimed at developing hope, self-efficacy, optimism, and resilience in teachers can be effective in boosting innovative behavior. Professional development initiatives should focus on strengthening these aspects of psychological capital.

Supportive Leadership: School leadership should be trained to create environments that encourage continuous learning and system connection, as these were crucial in mediating the relationship between psychological capital and innovative behavior.

Declarations

ETHICS STATEMENT

This study involved human research participants and was performed in accordance with the ethical standards as outlined in the approval granted by the Ethics Review Committee of the College of Education, Oda Bultum University, Ethiopia. Ethical approval was obtained from this committee prior to data collection.

The study was conducted in full compliance with these national and institutional guidelines and regulations. Informed consent was obtained from all participants before they took part in the study. Participation was voluntary, and participants were informed about the purpose of the study, their right to withdraw at any time, and the confidential nature of the study.

CONSENT TO PARTICIPATE

Informed consent was obtained from all participants before they took part in the study. Participation was voluntary, and participants were informed about the purpose of the study, their right to withdraw at any time, and the confidential nature of the study.

CONSENT TO PUBLISH STATEMENT

Not applicable.

AVAILABILITY OF DATA AND MATERIAL

The datasets used and /or analyzed during the current study are available from the corresponding author on reasonable request.

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COMPETING INTERESTS

The authors declare that there are no financial or non-financial conflicts of interest.

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Figures

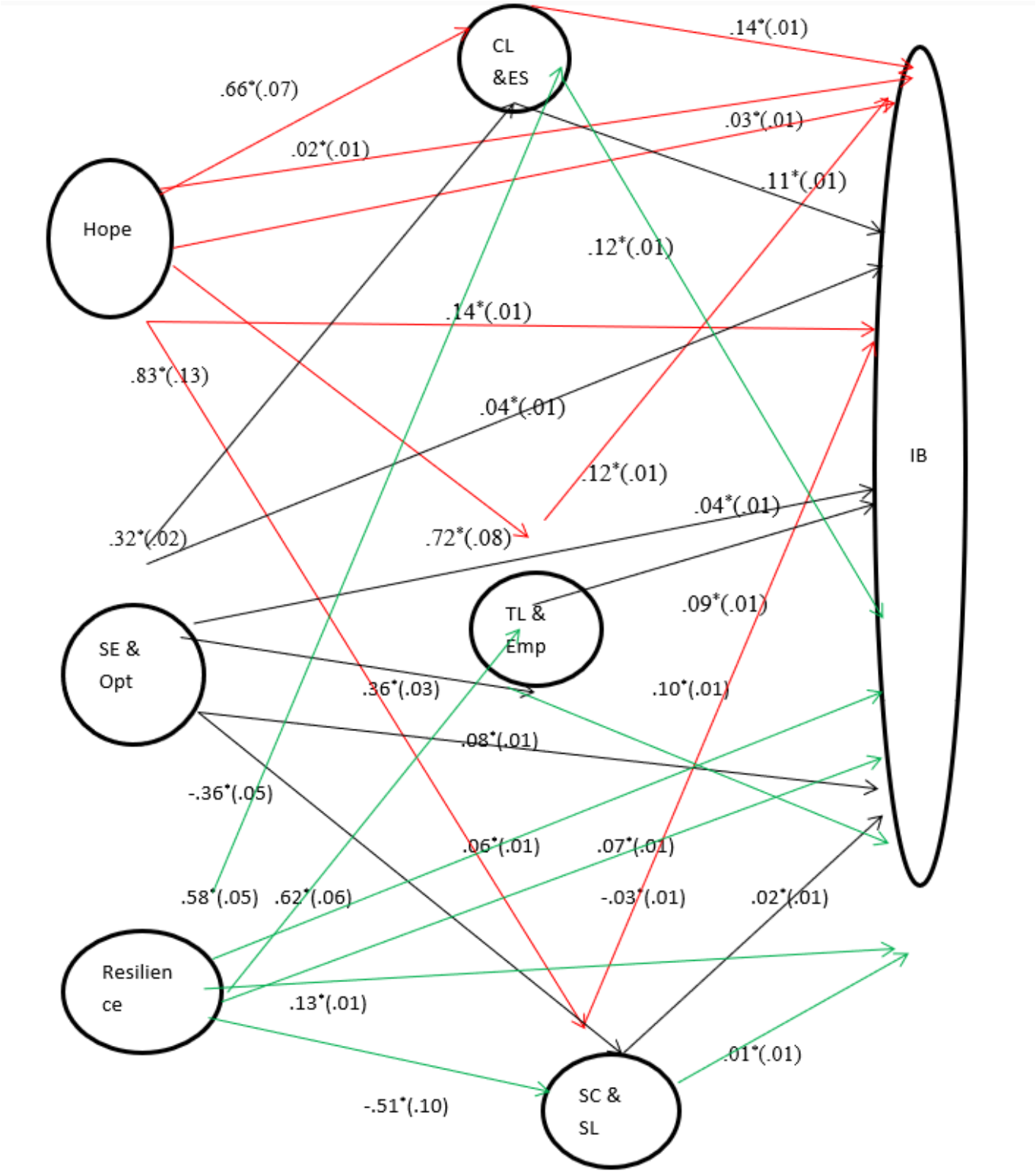


Figure 1

Mediation model of how psychological capital influence preschool teachers' innovative behavior via school as a learning institution.