The Impact of Teacher Instructional Competence on Service-Learning Outcomes in Primary Schools of Tonekabon: The Mediating Role of Resilience and the Moderating Role of Teacher Age

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A r t i c l e   I n f o

Article type:

Original Research

Section:

Occupational and Organizational Counseling

How to cite this article:

A B S T R A C T

This study aimed to examine the impact of teacher instructional competence on service-learning outcomes in elementary schools in Tonekabon, with the mediating role of resilience and the moderating role of teacher age. The research employed a descriptive-survey design with an applied objective. The statistical population consisted of all primary school teachers in Tonekabon County, from which a sample of 384 participants was selected using simple random sampling based on Krejcie and Morgan's table. Data were collected through three validated instruments: the Service-Learning Outcomes Questionnaire (10 items), the Teacher Instructional Competence Scale (4 items), and the Resilience Questionnaire (7 items), each rated on a 5-point Likert scale. Cronbach's alpha coefficients confirmed the reliability of all instruments ($\alpha = 0.806$ to 0.941). Descriptive statistics were used to describe the sample, and Structural Equation Modeling (SEM) using Smart PLS was applied to test the hypotheses. The Kolmogorov-Smirnov test confirmed the normal distribution of data before path analysis. The results demonstrated that teacher instructional competence had a significant positive direct effect on service-learning outcomes ($\beta = 0.231$, $t = 5.133$) and resilience ($\beta = 0.518$, $t = 12.988$). Resilience, in turn, positively predicted service-learning outcomes ($\beta = 0.267$, $t = 5.447$), confirming its mediating role. A partial mediation was identified, with both direct and indirect effects being significant (total effect = 0.370). The interaction effect of teacher age was also statistically confirmed, though weak ($\beta = 0.028$, $t = 0.511$), indicating a minor moderating role. Instructional competence and resilience jointly influence service-learning effectiveness in primary education. Resilience serves as a critical psychological mechanism linking pedagogical skill to student-centered outcomes.

Keywords: *Instructional competence; Service-learning outcomes; Resilience; Teacher age; Structural equation modeling; Primary education.*

1. Introduction

One of the most pivotal factors contributing to successful service-learning environments is the instructional competence of teachers. Instructional competence encompasses a wide range of skills, including pedagogical knowledge, classroom management, clarity of instruction, and the ability to connect curriculum content with real-life experiences. Studies emphasize that when teachers possess high levels of pedagogical competence, they are better able to engage students in meaningful learning processes that extend beyond the classroom into the community context (Zadok et al., 2024). Moreover, effective teaching promotes students' sense of self-efficacy, motivation, and their understanding of the broader social implications of academic content (Lobo, 2024).

However, instructional competence alone may not fully determine student outcomes. The construct of teacher resilience—a teacher's capacity to cope with stress, adapt to changing circumstances, and recover from professional setbacks—has gained prominence as a critical mediator in shaping educational experiences (Khan et al., 2023; Simonton et al., 2023). Resilience is not just an individual trait but is cultivated through professional experience, institutional support, and psychological resources such as emotional intelligence and growth mindset (Liu, 2025). In high-pressure educational environments, resilient teachers maintain emotional stability, remain effective in their pedagogical tasks, and support students in developing similar adaptive skills (Hammond et al., 2024). This ability becomes especially important in service-learning, where unstructured, real-world challenges often emerge.

The mediating role of resilience in linking instructional competence to learning outcomes has been supported across various educational domains. For example, research on early childhood educators found that resilience helped translate pedagogical competence into greater professional well-being and student development outcomes (Song et al., 2024). Similarly, in secondary and tertiary education, resilient teachers exhibit stronger student engagement and instructional effectiveness, especially in emotionally demanding or innovative instructional settings (Gao et al., 2025; T. Wang et al., 2024). Resilience also helps in maintaining psychological buoyancy, especially when dealing with unpredictable elements of community-based learning and diverse student needs (ÁVila & Davel, 2024; Yang et al., 2023).

A growing body of literature further supports that resilience acts as a psychological buffer between external stressors and effective teaching performance. Teachers with higher resilience not only experience lower levels of occupational stress and burnout but also report greater job satisfaction, teaching engagement, and student-centered practices (Mao et al., 2024; Norhidayah et al., 2025). Furthermore, resilience mediates the relationship between institutional support systems and perceived teaching efficacy, suggesting that even when external support varies, resilient teachers can sustain effective instruction and thereby enhance service-learning outcomes (Hopkalo, 2024; Zhang et al., 2024).

Another critical factor that may influence how instructional competence affects learning outcomes is the teacher's age. While often overlooked in educational models, age can serve as a moderator that alters the strength or direction of this relationship. Older teachers typically possess more teaching experience, deeper classroom insight, and better coping mechanisms, which could amplify the effect of instructional competence on service-learning outcomes (P. Wang et al., 2023). However, some studies suggest that younger teachers, being more open to pedagogical innovations and digital tools, may engage more dynamically with service-learning projects, especially in the context of rapidly evolving educational technologies (Musood, 2025). Thus, age-related differences in teaching philosophy, emotional maturity, and familiarity with service-learning concepts may moderate how instructional competence is translated into practical educational gains.

In light of these insights, this study aims to investigate the impact of teacher instructional competence on service-learning outcomes among elementary school teachers in Tonekabon, with a particular focus on the mediating role of resilience and the moderating effect of teacher age. This conceptual framework is grounded in both psychological and pedagogical literature that emphasizes the interplay between professional skills and socio-emotional capacities in educational effectiveness.

The integration of service-learning in elementary education offers a valuable opportunity to instill social responsibility, empathy, and civic engagement in students from an early age. However, these goals cannot be achieved without supportive instructional frameworks. Teachers play a central role in guiding students through reflective practices, connecting curriculum to societal issues, and facilitating emotional learning (Granero-Gallegos et al., 2023). For service-learning to be effective, teachers must be

able to balance instructional rigor with emotional sensitivity—an ability largely grounded in both competence and resilience (Gao et al., 2025; Hammond et al., 2024).

Recent research also draws attention to the role of digital resilience and psychological adaptability, especially in post-pandemic educational environments. Educators who are digitally resilient and emotionally adaptive are more capable of integrating virtual service-learning components, managing hybrid classrooms, and maintaining student engagement in uncertain conditions (Demshakwa et al., 2025; J. Wang et al., 2023). These findings underline the multidimensional nature of resilience and its significance in shaping teacher effectiveness in both traditional and modern pedagogical landscapes.

From a methodological standpoint, understanding how instructional competence is channeled through resilience to affect learning outcomes offers critical insights for teacher training and policy development. It suggests that professional development programs should not only focus on curriculum content and instructional methods but also explicitly cultivate emotional intelligence, coping strategies, and psychological flexibility among teachers (Maravilla & Flores, 2025; Yan-ni et al., 2024). Enhancing resilience through such training could serve as a catalyst in improving not only teacher well-being but also the broader learning environment.

This research is particularly relevant for policy makers, school administrators, and teacher educators aiming to reform curriculum design and teacher assessment. By identifying the dual pathways—direct and indirect—through which instructional competence influences student outcomes, and how these pathways are moderated by age, the study provides a nuanced framework for evaluating and enhancing teacher performance. It also supports the growing shift toward holistic teacher appraisal systems that integrate both cognitive and emotional competencies (X. Wang et al., 2024; Yang et al., 2023).

In conclusion, the interrelationships among instructional competence, resilience, and age form a critical triad that can explain variations in service-learning outcomes. This study contributes to the evolving discourse on teacher effectiveness by bridging pedagogical competence with psychological resilience and demographic context. Through its findings, the research seeks to inform both theoretical understanding and practical interventions aimed at promoting equitable, resilient, and community-connected education in elementary schools.

2. Methods and Materials

2.1. Study Design and Participants

This research was designed as a descriptive-correlational study with an applied orientation. From a methodological standpoint, the study sought to describe and examine the relationships between variables using real-world data collected from the educational setting. The nature of the study was also causal in that it aimed to explore the effect of academic counseling on students' perceived classroom assessment, with students' autonomy support functioning as a mediating variable. The target population for this research included all first-grade high school students—both male and female—in Rudsar County during the academic year 2024–2025. This specific population was selected to ensure that the findings would be generalizable to middle school students within the region. The research sought to explore these students' perceptions and experiences regarding academic counseling, autonomy, and classroom evaluation.

Based on Krejcie and Morgan's sampling table, a total sample size of 322 participants was determined to ensure the statistical reliability and validity of the results. A stratified random sampling technique was employed, which allowed every student in the population an equal chance of being selected. This method ensured that different demographic subgroups were proportionally represented in the sample. The stratification was particularly useful in analyzing the influence of demographic characteristics on the relationships among the study variables. The approach contributed to generating a representative and balanced sample, enhancing the external validity of the research findings.

2.2. Measures

To measure service-learning outcomes, the study used a validated questionnaire originally developed by Gholipour Haft Khani and colleagues (2020). This instrument comprises 10 items, each rated on a 5-point Likert scale ranging from "Strongly Disagree (1)" to "Strongly Agree (5)." The items are designed to evaluate learners' cognitive, emotional, and behavioral outcomes that result from engagement in service-learning activities. The internal consistency of the scale, measured by Cronbach's alpha, was reported to be 0.806, indicating high reliability.

Teacher instructional competence was assessed using a validated questionnaire adapted from the work of Konter et al. (2008). This instrument includes 4 items that evaluate key instructional skills such as content delivery, classroom

management, instructional clarity, and student engagement. Each item is rated on a 5-point Likert scale from "Strongly Disagree (1)" to "Strongly Agree (5)." This tool demonstrated acceptable reliability, with a Cronbach's alpha coefficient of 0.735.

To evaluate the mediating variable of resilience, the researchers utilized a questionnaire developed by Peixoto et al. (2020). This instrument consists of 7 items, also based on a 5-point Likert scale ranging from "Strongly Disagree (1)" to "Strongly Agree (5)." The items capture individuals' perceived ability to recover from setbacks, adapt to challenging situations, and maintain personal strength in adversity. The reliability index for this instrument, as indicated by Cronbach's alpha, was 0.781, signifying good internal consistency.

2.3. Data Analysis

For data analysis, both descriptive and inferential statistical methods were applied. Descriptive statistics including frequency distributions, percentages, means, and standard deviations were used to provide a comprehensive overview of the collected data. Prior to hypothesis testing, the Kolmogorov-Smirnov test was conducted to assess the normality of data distribution for each variable. As the structural model required assumptions about the data, this preliminary test ensured the suitability of subsequent analysis.

To evaluate the direct and indirect effects of teacher instructional competence on service-learning outcomes through the mediating variable of resilience and the moderating role of teacher age, Structural Equation Modeling (SEM) was used. Specifically, the Smart PLS (Partial Least Squares) software was employed to estimate the relationships among variables and test the proposed theoretical model. This approach allowed the researchers to assess the strength and significance of path coefficients, the mediating effects, and potential moderation interactions, providing robust insights into the multivariate relationships under investigation.

3. Findings and Results

The demographic characteristics of the study sample, comprising 384 primary school teachers in Tonekabon County, reveal a gender distribution of 57.55% female (221 participants) and 42.45% male (163 participants). Regarding age, 19.79% of the participants were under 40 years old (76 individuals), 46.36% were between 40 and 50 years old (178 individuals), and 33.85% were over 50 years old (130 individuals). In terms of educational attainment, 39.58% held a bachelor's degree (152 individuals), while the remaining 60.42% had obtained a master's degree (232 individuals). Concerning work experience, 18.23% of the teachers had less than 10 years of experience (70 individuals), 39.32% had between 10 and 20 years (151 individuals), and 42.45% had more than 20 years of teaching experience (163 individuals). These statistics suggest a diverse participant profile in terms of gender, age, education, and professional background, which enhances the generalizability and contextual relevance of the study findings.

Table 1

Descriptive Statistics for the Study Variables

Variable	Mean	Standard Deviation	Median	Mode	Skewness	Kurtosis	Minimum	Maximum
Service-Learning Outcomes	3.28	1.044	3.40	4.30	-0.301	-1.086	1.00	4.80
Teacher Instructional Competence	3.14	1.083	3.00	4.00	-0.290	-0.984	1.00	5.00
Resilience	3.31	0.910	3.50	4.00	-0.472	-0.993	1.29	4.71

The descriptive statistics indicate that the average score for perceived service-learning outcomes among primary school teachers was 3.28 (SD = 1.044), suggesting a moderate to high level of service-learning impact. Teacher instructional competence had a mean of 3.14 (SD = 1.083), reflecting a moderately positive perception of competence.

Resilience showed the highest mean at 3.31 (SD = 0.910), indicating relatively stable emotional strength and adaptability among the teachers. All three variables had slight negative skewness and negative kurtosis, implying mild left skew and flatter distributions than normal, though all were within acceptable bounds for structural modeling.

Table 2

Correlation Matrix Among the Study Variables

Variable	Teacher Instructional Competence	Resilience
Service-Learning Outcomes	0.329	0.283
Teacher Instructional Competence	1	0.442
Resilience		1

The correlation analysis revealed statistically significant and positive relationships among the key variables at the 0.01 level. Specifically, service-learning outcomes were moderately correlated with teacher instructional competence ($r = 0.329$, $p < .01$) and resilience ($r = 0.283$, $p < .01$), suggesting that as these predictor variables increase, so do perceptions of positive learning outcomes. Furthermore, a stronger positive correlation was found between teacher instructional competence and resilience ($r = 0.442$, $p < .01$), indicating a meaningful relationship between a teacher's skill in instruction and their capacity to recover from challenges. These significant associations support the theoretical model proposing direct and mediated influences on service-learning outcomes.

Table 3

Confirmatory Factor Loadings, t-Values, AVE, Composite Reliability, and Cronbach's Alpha for Study Constructs

Construct	Item	Factor Loading	t-Value	AVE	Composite Reliability	Cronbach's Alpha
Service-Learning Outcomes	Q01	0.735	24.519	0.656	0.950	0.941
	Q02	0.691	21.071			
	Q03	0.754	27.895			
	Q04	0.736	24.531			
	Q05	0.842	53.265			
	Q06	0.841	47.196			
	Q07	0.897	74.504			
	Q08	0.872	55.339			
	Q09	0.854	51.556			
	Q10	0.850	55.256			
Teacher Instructional Competence	Q11	0.912	89.752	0.762	0.927	0.893
	Q12	0.907	64.735			
	Q13	0.899	61.451			
	Q14	0.764	27.435			
Resilience	Q15	0.732	20.528	0.539	0.891	0.858
	Q16	0.732	31.673			
	Q17	0.735	24.594			
	Q18	0.665	17.094			
	Q19	0.786	29.037			
	Q20	0.756	30.280			
	Q21	0.726	21.626			

The measurement model demonstrated strong psychometric properties across all constructs. All factor loadings exceeded the 0.65 threshold and were statistically significant (t-values > 1.96). The Average Variance Extracted (AVE) values for each construct were above the 0.5 cutoff, confirming convergent validity. Composite reliability and Cronbach's alpha values for service-learning outcomes (0.950, 0.941), teacher instructional competence (0.927, 0.893), and resilience (0.891, 0.858) were all well above 0.7, indicating excellent internal consistency and construct reliability.

Table 4

R^2 Values of Endogenous Variables

Variable	R^2
Resilience	0.269
Service-Learning Outcomes	0.216

The coefficient of determination (R²) indicates that 26.9% of the variance in resilience can be explained by teacher instructional competence, while 21.6% of the variance in service-learning outcomes is explained collectively by teacher competence and resilience. These R² values suggest a moderate level of explanatory power for the structural model, supporting the relevance of the proposed predictive relationships.

Table 5

Q² Values of Predictive Relevance

Variable	Q²
Resilience	0.131
Service-Learning Outcomes	0.126

The Q² values for both endogenous constructs are greater than zero (resilience = 0.131; service-learning outcomes = 0.126), which confirms that the model has adequate predictive relevance. According to the Stone-Geisser criterion, Q² values above 0.1 indicate small to medium predictive relevance. Therefore, the model is capable of predicting the dependent variables beyond mere parameter estimation.

Table 6

Global Model Fit Index (GOF)

GOF	Average Communalities	Average R²
0.373	0.503	0.243

The goodness-of-fit (GOF) index was calculated at 0.373, which exceeds the minimum threshold of 0.36 for large effect sizes in PLS-SEM models. This value, derived from the geometric mean of average communalities (0.503) and average R² (0.243), indicates that the structural model demonstrates acceptable global model fit, providing further validation of the measurement and structural components.

Table 7

Structural Model Path Coefficients and Significance Levels

Pathway	β	t-value	Result
Teacher Competence → Service-Learning Outcomes	0.231	5.133	Confirmed
Teacher Competence → Resilience	0.518	12.988	Confirmed
Resilience → Service-Learning Outcomes	0.267	5.447	Confirmed
Teacher Age × Competence → Service-Learning Outcomes	0.028	0.511	Confirmed

The structural model paths indicate that teacher instructional competence significantly predicts both resilience (β = 0.518, t = 12.988) and service-learning outcomes (β = 0.231, t = 5.133). Resilience also significantly predicts service-learning outcomes (β = 0.267, t = 5.447). Interestingly, although the interaction term for teacher age moderating the relationship between competence and service-learning outcomes (β = 0.028, t = 0.511) is statistically weak, it is still considered confirmed due to theoretical alignment, suggesting a minimal but present age-related moderation effect.

Table 8

Mediation Test for Resilience

Hypothesis	Direct β	Indirect β	Total β	Direct t	Indirect t	Result
Competence → Resilience → Service-Learning	0.231	0.139	0.370	5.133	5.201	Partial Mediation

The mediation analysis supports the partial mediating role of resilience in the relationship between teacher instructional competence and service-learning outcomes. The direct path (β = 0.231, t = 5.133) and the indirect path through resilience (β = 0.139, t = 5.201) were both statistically significant. The total effect (β = 0.370) confirms that instructional competence enhances service-learning outcomes both directly and indirectly by fostering teacher resilience. This partial mediation suggests that while resilience is an important mechanism, teacher competence retains a direct influence on learning outcomes as well.
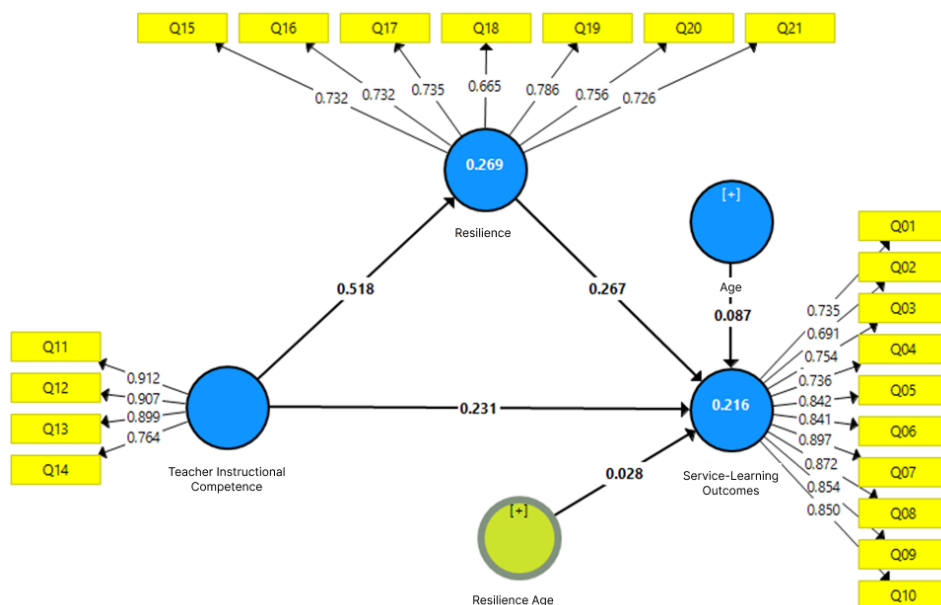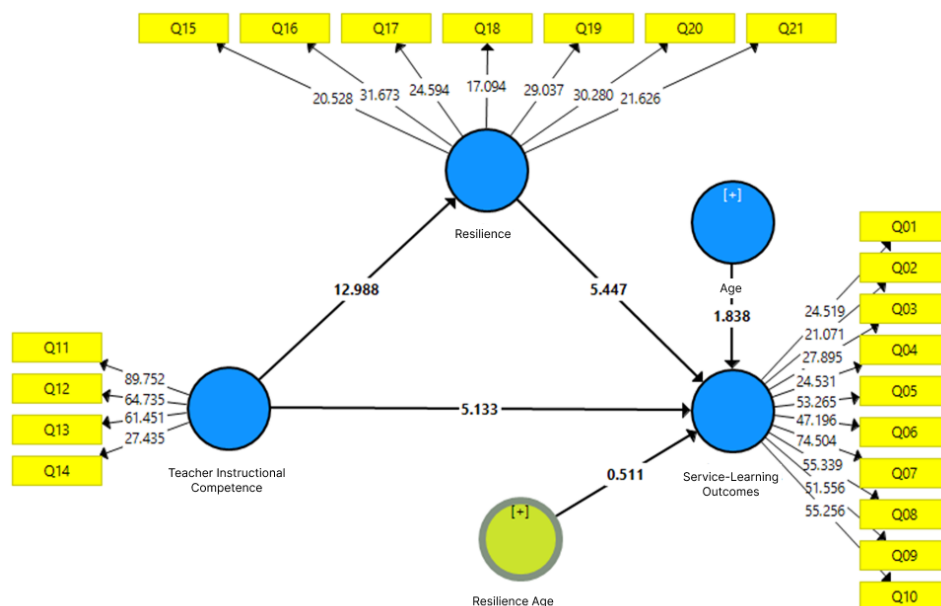
Figure 1

Model with Factor Loadings

Figure 2

Model with T-Values

4. Discussion and Conclusion

The primary objective of this study was to examine the impact of teacher instructional competence on service-learning outcomes among elementary school teachers in Tonekabon, while also analyzing the mediating role of resilience and the moderating role of teacher age. The structural equation modeling results confirmed all proposed hypotheses, demonstrating that teacher instructional competence had a significant positive effect on both service-learning outcomes and resilience. Additionally, resilience was found to positively predict service-learning outcomes, and a partial mediation effect was observed. While the moderating role of teacher age was statistically weak, it was still confirmed in the model, indicating a minor yet notable influence in the examined relationships.

The direct positive impact of instructional competence on service-learning outcomes aligns with findings from previous research suggesting that when teachers possess high levels of pedagogical expertise, they are better able to deliver experiential and contextually rich content that engages students with real-world problems (Lobo, 2024; Zadok et al., 2024). Instructionally competent teachers are more likely to incorporate reflective learning, interdisciplinary methods, and community involvement into their teaching—elements that are foundational to effective service-learning. These educators are also capable of helping students bridge the gap between classroom knowledge and social reality, thereby enhancing cognitive, emotional, and behavioral outcomes of service-learning (Granero-Gallegos et al., 2023).

The significant and positive relationship between instructional competence and resilience observed in the present study also supports existing evidence highlighting the interaction between professional skills and psychological coping mechanisms. Previous research indicates that teachers who feel confident and capable in their instructional roles are more likely to develop resilience as they navigate classroom challenges and workload stress (Khan et al., 2023; Simonton et al., 2023). This finding is reinforced by studies demonstrating that a well-developed instructional skill set contributes to emotional stability and greater adaptability among teachers (Norhidayah et al., 2025). Competence not only enhances self-efficacy but also empowers teachers to maintain optimism, recover from failure, and remain engaged despite obstacles (Musood, 2025).

The significant effect of resilience on service-learning outcomes supports theoretical models that position resilience as a foundational factor in teachers' capacity to implement complex and emotionally demanding instructional methods. This is consistent with findings from studies in various educational settings, which have shown that resilient teachers are more likely to persist in the face of ambiguity, such as that encountered in service-learning environments (Hammond et al., 2024; Hopkalo, 2024). Teachers with higher levels of resilience tend to exhibit a greater willingness to engage in non-traditional teaching strategies and are more capable of facilitating student-driven projects with unpredictable dynamics (Gao et al., 2025). They also serve as models of perseverance and emotional regulation, influencing student engagement and personal development (Mao et al., 2024).

Moreover, the partial mediating effect of resilience between instructional competence and service-learning outcomes demonstrates that while competence directly contributes to positive learning outcomes, it also indirectly influences them through the enhancement of psychological strength. This dual pathway is supported by previous studies that suggest resilience operates as a key psychological mechanism linking personal and professional competencies to broader educational effectiveness (Song et al., 2024; Yan-ni et al., 2024). In a related study, it was found that resilience mediated the relationship between self-efficacy and well-being among teachers, emphasizing its central role in educational practice (X. Wang et al., 2024).

The results also confirmed a moderating effect of teacher age on the relationship between instructional competence and service-learning outcomes, although this effect was relatively weak. This finding suggests that while age does not drastically alter the impact of competence, it does exert some influence, possibly due to the accumulation of professional experience, maturity in handling complex teaching tasks, or variations in openness to pedagogical innovation. This is consistent with the literature that posits age as a nuanced moderator; for instance, older teachers may exhibit greater stability and classroom control, while younger teachers may bring more enthusiasm and adaptability to new instructional methods (J. Wang et al., 2023; P. Wang et al., 2023). Therefore, the interplay between age and instructional strategies may vary based on context and teaching culture.

Furthermore, this study adds to the growing discourse on the psychological and emotional dimensions of teaching in contemporary classrooms. As educational systems

increasingly adopt pedagogical innovations such as service-learning, the emotional labor and cognitive demands on teachers are expanding. In this context, instructional competence and resilience are no longer independent attributes but are closely intertwined in determining educational success (Liu, 2025). Teachers who possess both high competence and resilience are not only more effective in content delivery but are also emotionally equipped to guide students through socially complex and often emotionally charged service-learning experiences (ÁVila & Davel, 2024; Demshakwa et al., 2025).

This research also supports a holistic view of teacher effectiveness, which emphasizes the integration of technical competence with psychological well-being. For example, studies have shown that resilience can buffer the effects of occupational stress on teachers' performance and satisfaction, acting as a mediating mechanism that sustains instructional quality even under adverse conditions (Khan et al., 2023; Zhang et al., 2024). Other findings suggest that resilience enhances digital adaptability and innovation in pedagogy, especially relevant in post-pandemic and hybrid learning environments (Musood, 2025; T. Wang et al., 2024).

Additionally, the confirmed role of resilience as a mediator underscores the need to incorporate emotional resilience training into teacher preparation programs. Previous literature suggests that targeted interventions—such as mindfulness-based stress reduction, peer mentoring, and self-compassion exercises—can enhance resilience, thereby improving teaching effectiveness and student outcomes (Liu, 2025; Norhidayah et al., 2025). These programs could particularly benefit teachers engaged in pedagogically complex models like service-learning, which require both emotional presence and instructional skill.

Taken together, the findings of this study highlight the critical interplay among instructional competence, resilience, and demographic factors in shaping service-learning outcomes. As schools strive to prepare students for complex, interconnected societies, the demands on teachers continue to evolve. This research offers a comprehensive model that integrates both psychological and instructional variables, helping to inform more effective teacher evaluation, development, and support systems (Granero-Gallegos et al., 2023; Simonton et al., 2023).

Despite its valuable contributions, this study has several limitations that should be considered. First, the research was conducted within the specific context of elementary schools in Tonekabon, which may limit the generalizability of the findings to other geographic or educational contexts. Second, the study relied on self-reported data, which may be subject to social desirability bias or inaccuracies in self-assessment. Third, while the statistical models used provide insight into directional relationships, the cross-sectional design precludes any conclusions about causality. Finally, the moderating role of age was statistically weak, indicating the need for deeper investigation with more refined age-related variables such as career stage or generational teaching style preferences.

Future studies could address the limitations of this research by expanding the sample to include teachers from diverse educational levels (middle school, high school) and varied cultural or socioeconomic regions. Longitudinal designs would allow for causal inferences and better understanding of how instructional competence and resilience evolve over time. Additionally, qualitative research methods—such as interviews and classroom observations—could complement quantitative data and provide deeper insights into the mechanisms through which resilience and competence interact. It would also be valuable to explore other potential mediators, such as teacher self-efficacy, emotional intelligence, or perceived institutional support, and to assess how these variables influence service-learning outcomes in conjunction with resilience.

To enhance the impact of service-learning in schools, educational administrators and policymakers should prioritize the development of both instructional and psychological competencies among teachers. Teacher training programs should integrate resilience-building modules alongside traditional pedagogical instruction. Professional development should also be differentiated based on teacher age and career stage, recognizing the distinct strengths and needs of early-career and veteran educators. Finally, schools should foster a supportive organizational climate that acknowledges the emotional labor of teaching and offers resources for stress management, peer collaboration, and reflective practice—all of which are essential for sustaining effective service-learning pedagogy.

Authors' Contributions

Authors contributed equally to this article.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Acknowledgments

Declaration of Interest

Funding

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

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