Original Article

The Mediating Effect of Instructional Management on the Relationship Between Test Construction Skills and Critical Thinking Motivation of Teachers

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Abstract

This study investigated whether instructional management mediates the relationship between teachers' test construction skills and critical thinking motivation in public elementary schools in the Bansalan East District of Davao del Sur. Utilizing a descriptive-correlational design, the research surveyed teachers using standardized questionnaires to assess these three core areas. Overall, teachers demonstrated extensive test construction skills alongside highly extensive levels of critical thinking motivation and instructional management. The analysis revealed strong positive correlations among all three variables. Crucially, mediation analysis demonstrated that instructional management partially mediates the relationship between test construction skills and critical thinking motivation, even as the direct effect of assessment skills on motivation remained significant. Ultimately, the findings indicate that stronger assessment practices enhance student motivation for critical thinking, an effect that is significantly reinforced when teachers operate within environments with robust instructional management.

Keywords: assessment literacy, critical thinking, instructional management, mediation, teacher motivation

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1. Introduction

Teachers' capacity to design sound classroom assessments is central to instructional quality because assessment determines how evidence of learning is

elicited, interpreted, and acted upon. Contemporary scholarship treats teacher assessment literacy as more than technical item writing. It includes understanding task design, alignment, validity, interpretation, and responsible use of evidence for instructional decision making. Pastore and Andrade (2019) argued that assessment literacy is multidimensional, while Pastore (2023) later showed that the field increasingly positions assessment knowledge as a professional competence that directly shapes teaching quality. For classroom teachers, test construction skill is therefore not a peripheral task. It is part of the core architecture of instruction.

The educational importance of this competence becomes clearer when teachers operate under accountability pressures, limited preparation time, and diverse learner needs. When teachers construct tests with weak alignment, unclear language, or uneven coverage, the resulting evidence can distort instructional judgment and weaken confidence in classroom decisions. Recent work has also shown that gaps in assessment literacy are linked not only to technical weaknesses but also to professional strain. Rezai (2024) found that teacher assessment literacy has implications for teachers' stress and burnout, which suggests that better assessment competence may support more confident and sustainable professional practice. In the present study, test construction skills were treated as a classroom-level manifestation of this broader assessment competence.

Critical thinking motivation represents a different but related professional disposition. It reflects the extent to which teachers value rigorous reasoning, expect that they can think well, perceive practical utility in critical thought, and remain willing to invest effort despite cost. Expectancy-value perspectives remain useful for explaining why professionals persist in cognitively demanding work. Jud et al. (2023) showed that success expectancies, values, and costs matter in teachers' motivation for complex instructional work, while Valenzuela et al. (2023) reported that motivational dimensions such as expectancy and utility are meaningful predictors of critical thinking performance. For teachers, motivation for critical thinking is not merely an individual trait. It affects how they analyze classroom evidence, justify pedagogical choices, and revise instruction in light of learner response.

Critical thinking, however, does not flourish in a vacuum. Teacher beliefs, school conditions, and professional learning environments shape whether rigorous thinking is enacted in daily practice. Leibovitch et al. (2025) showed that teachers' beliefs about critical thinking can either support or constrain implementation, and that professional learning can move teachers from maladaptive beliefs toward more adaptive ones. Wason (2025) similarly argued that learning to teach critical thinking is demanding and often troublesome, which means teachers need organizational support if they are to sustain reflective and intellectually rigorous work. In teacher education more broadly, Miller et al. (2024) emphasized that critical thinking gains traction when it is tied to transformative praxis rather than treated as a detached slogan.

Instructional management provides a plausible mechanism linking assessment competence and critical thinking motivation. Effective instructional management clarifies school goals, coordinates the instructional program, protects learning time,

and sustains a climate for professional growth. Research consistently shows that instructional leadership and related management practices shape teacher practice through supportive conditions rather than command alone. Dorukbaşi and Cansoy (2024) found that teacher professional learning mediates the relationship between instructional leadership and instructional practices, while Elfira et al. (2024) reported that leadership effects on teacher performance are strengthened through teacher self-efficacy. At the system level, Aydin et al. (2025) further showed that school leadership influences instructional pathways connected to student achievement and cognitive activation. These studies suggest that instructional management can function as an enabling condition through which technical competence becomes meaningful classroom action.

Despite these converging lines of research, the relationship between test construction skills and critical thinking motivation has rarely been examined through an explicit mediation model in the context of public elementary teachers. Much of the assessment literature focuses on competence, and much of the critical thinking literature focuses on pedagogy or beliefs, yet fewer studies ask how school-based instructional management helps convert assessment competence into stronger motivation for analytical and reflective work. This gap is particularly relevant in public elementary settings where teachers face simultaneous demands in assessment, classroom management, reporting, and curriculum delivery. The present study addressed this gap by examining whether instructional management partially explains the relationship between teachers' test construction skills and their critical thinking motivation among public elementary school teachers in Bansalan East District, Davao del Sur.

2. Methodology

The study used a non-experimental quantitative design with a descriptive-correlational approach to examine the association among test construction skills, instructional management, and critical thinking motivation and to test the mediating role of instructional management.

The respondents were 210 public elementary school teachers in Bansalan East District, Bansalan, Davao del Sur, selected through universal sampling. Teachers were included if they were currently employed in the district, had at least three years of teaching experience, and consented to participate. The study was conducted during School Year 2025-2026.

Data were gathered through an adapted standardized questionnaire composed of three instruments. Test construction skills covered language use, content coverage, item organization, and test guidance and drew from Agu et al. (2013). Critical thinking motivation was measured through value, expectancy, utility, cost, attainment, and interest using an instrument adapted from Valenzuela et al. (2011). Instructional management covered defining the school mission, managing the instructional

program, and developing the school learning climate through an instrument adapted from Gurley et al. (2016). All instruments were reviewed and validated by experts, and responses were recorded on a five-point Likert scale.

Formal permissions were secured from education authorities and school heads before data collection. Participation was voluntary, informed consent was obtained, and confidentiality was protected through anonymized coding and secure data handling in line with institutional ethical review procedures and the Data Privacy Act of 2012.

The data were analyzed using mean and standard deviation to determine variable levels, Pearson product-moment correlation to test associations, regression to estimate coefficients for mediation, and MedGraph with Sobel z-test to determine the significance and nature of the mediating effect at the 0.05 level of significance.

3. Results

Across the four domains of test construction skills in Table 1, language use obtained the highest mean (M = 4.19, SD = 0.77), followed by content coverage (M = 4.14, SD = 0.75), item organization (M = 4.12, SD = 0.70), and test guidance (M = 4.09, SD = 0.70). The overall mean for test construction skills was 4.14 (SD = 0.68), interpreted as extensive.

Table 1. Summary of test construction skills of public elementary school teachers.

Domain	Mean	SD	Descriptive level
Language use	4.19	0.77	Extensive
Content coverage	4.14	0.75	Extensive
Item organization	4.12	0.70	Extensive
Test guidance	4.09	0.70	Extensive
Overall	4.14	0.68	Extensive

Table 2. Summary of critical thinking motivation of public elementary school teachers.

Domain	Mean	SD	Descriptive level
Value	4.22	0.75	Very Extensive
Expectancy	4.16	0.72	Extensive
Utility	4.18	0.80	Extensive
Cost	4.31	0.85	Very Extensive
Attainment	4.21	0.85	Very Extensive
Interest	4.21	0.83	Very Extensive
Overall	4.21	0.80	Very Extensive

Across the six domains of critical thinking motivation in Table 2, cost obtained the highest mean (M = 4.31, SD = 0.85), followed by value (M = 4.22, SD = 0.75),

attainment (M = 4.21, SD = 0.85), interest (M = 4.21, SD = 0.83), utility (M = 4.18, SD = 0.80), and expectancy (M = 4.16, SD = 0.72). The overall mean for critical thinking motivation was 4.21 (SD = 0.80), interpreted as very extensive.

Instructional management was also rated highly across all domains (Table 3). Defining the school mission obtained the highest mean (M = 4.28, SD = 0.80), followed by developing the school learning climate (M = 4.24, SD = 0.78) and managing the instructional program (M = 4.22, SD = 0.78). The overall mean for instructional management was 4.25 (SD = 0.79), interpreted as very extensive.

Table 3. Summary of instructional management of public elementary school teachers.

Domain	Mean	SD	Descriptive level
Defining the school mission	4.28	0.80	Very Extensive
Managing the instructional program	4.22	0.78	Very Extensive
Developing the school learning climate	4.24	0.78	Very Extensive
Overall	4.25	0.79	Very Extensive

The correlation analysis showed strong and statistically significant positive relationships among all focal variables (Table 4). Test construction skills correlated with critical thinking motivation at r = .76 (R^2 = .58, p = 0.000), test construction skills correlated with instructional management at r = .71 (R^2 = .50, p = 0.000), and instructional management correlated with critical thinking motivation at r = .78 (R^2 = .61, p = 0.000).

Table 4. Correlation results.

Variables	r	p-value
Test construction skills and critical thinking motivation	0.76	0.000
Test construction skills and instructional management	0.71	0.000
Instructional management and critical thinking motivation	0.78	0.000

In the mediation model in Table 5, test construction skills significantly predicted critical thinking motivation in Step 1 (B = 0.635, SE = 0.084, p < .001, R^2 = .226). Instructional management significantly predicted critical thinking motivation in Step 2 (B = 0.589, SE = 0.062, p < .001), and test construction skills significantly predicted instructional management in Step 3 (B = 0.722, SE = 0.074, p < .001).

When test construction skills and instructional management were entered together, both remained significant predictors of critical thinking motivation. The coefficient for test construction skills declined to B = 0.311 (p = .001), while instructional management retained a significant coefficient of B = 0.448 (p < .001). The Sobel test yielded z = 5.144208 with p < .000001, confirming a significant indirect effect. The indirect effect was 0.32346 with a 95% confidence interval from 0.20022 to 0.44670 (Table 6).

Table 5. Regression estimates for the mediation model.

Model step	B	SE	p-value	R^2
Step 1. Path c: Test construction skills -> Critical thinking motivation	0.635	0.084	0.0	0.226
Step 2. Path b: Instructional management -> Critical thinking motivation	0.589	0.062	0.0	
Step 3. Path a: Test construction skills -> Instructional management	0.722	0.074	0.0	
Step 4a. Direct effect c' of test construction skills -> Critical thinking motivation controlling for instructional management	0.311		0.001	
Step 4b. Effect of instructional management -> Critical thinking motivation controlling for test construction skills	0.448		0.0	

Table 6. Indirect and total effects of the mediation model.

Statistic	Value
Sobel z-value	5.144208
p-value	< 0.000001
Type of mediation	Partial mediation
95% CI lower bound	0.20022
95% CI upper bound	0.44670
Indirect effect (a*b)	0.32346
SE of indirect effect	0.06288
Standardized total effect	0.475
Standardized direct effect	0.233
Standardized indirect effect	0.242
R^2 total effect	0.226
R^2 direct effect	0.036
R^2 indirect effect	0.189

4. Discussion

The study shows that teachers reported strong assessment-related practice and equally strong motivation for critical thinking, with instructional management emerging as an important explanatory pathway. The extensive rating for test construction skills suggests that teachers perceived themselves as generally capable in

item writing, language use, coverage, organization, and guidance. This pattern is broadly consistent with the view that classroom assessment competence is a professional resource rather than a narrow testing function. Pastore and Andrade (2019) described assessment literacy as a multidimensional competence, and Pastore (2023) emphasized that the construct has evolved toward a broader understanding of teachers' judgment, interpretation, and use of evidence. The present findings align with that view by suggesting that item-writing skill likely reflects a larger orientation toward organized and evidence-based teaching.

The high levels of critical thinking motivation are also notable. Value, cost, attainment, and interest were all rated very highly, which indicates that teachers largely saw critical thinking as worth the effort and professionally meaningful. This pattern fits expectancy-value interpretations of motivated professional action. Jud et al. (2023) showed that teachers' success expectancies, values, and perceived costs are linked to whether they engage in demanding forms of instructional work. In a similar vein, Valenzuela et al. (2023) found that motivational dimensions such as expectancy and utility help explain critical thinking performance. The present results extend those ideas to practicing elementary teachers by indicating that critical thinking motivation can remain robust even in a context of multiple classroom demands.

Instructional management was likewise rated very highly, especially in defining the school mission. This suggests that teachers perceived the school leadership environment as visible, goal-oriented, and instructionally focused. Such a result matters because instructional management is the organizational bridge between teacher capability and teacher action. Dorukbaşi and Cansoy (2024) found that instructional leadership strengthens instructional practice partly through teacher professional learning, while Elfira et al. (2024) showed that leadership effects on teacher performance are reinforced through teacher self-efficacy. The present study complements these findings by suggesting that school-level instructional management may also help transform teachers' assessment competence into stronger motivation for analytic and reflective professional work.

The correlation results confirm that stronger test construction skills are associated with stronger critical thinking motivation and stronger instructional management. One interpretation is that teachers who construct tests more carefully may also be those who think more deliberately about evidence, alignment, and consequences, which are activities closely related to critical thought. Another interpretation is that schools with stronger instructional management may socialize teachers into more systematic professional habits, thereby elevating both assessment practice and reflective motivation. This reading is consistent with Aydin et al. (2025), who showed that school leadership shapes instructional pathways linked to cognitive activation, and with Rezai (2024), who indicated that assessment literacy carries wider professional consequences beyond technical test design alone.

The mediation results are the most theoretically important outcome of the study. Instructional management partially mediated the relationship between test construction skills and critical thinking motivation, which means that assessment

competence had both a direct pathway and an indirect pathway through the school's instructional management environment. The decline in the coefficient from B = 0.635 to B = 0.311 after the inclusion of instructional management indicates that part of the original association was transmitted through the mediator, yet the direct effect remained statistically significant. This pattern fits contemporary leadership research that treats school processes as enabling conditions rather than total explanations. Dorukbaşi and Cansoy (2024) reported a comparable mediating logic through teacher professional learning, and Elfira et al. (2024) documented a similar mechanism through teacher self-efficacy. Together with the present findings, these studies suggest that school-level processes often channel, strengthen, or organize the effect of teacher competencies rather than replace them (Lindo & Cutad, 2024; Lindo & Panes, 2024).

The findings also have implications for critical thinking in teacher development. Research on critical thinking education has shown that teachers' beliefs and working conditions affect whether critical thinking is meaningfully integrated into practice. Leibovitch et al. (2025) found that sustained professional learning can shift teachers' beliefs toward more adaptive positions that support critical thinking pedagogy, while Wason (2025) argued that learning to teach critical thinking is often troublesome and requires structured support. Miller et al. (2024) further contended that critical thinking gains force when it is embedded in meaningful pedagogical and social practice. The present study adds a related message: when teachers possess stronger test construction skills and operate within stronger instructional management conditions, they appear more motivated to engage in rigorous thought. This reinforces the view that critical thinking in schools is not solely an individual cognitive matter. It is also an organizational and professional one.

From a practical standpoint, the results indicate that improvement efforts should not isolate assessment training from instructional leadership and school management. Strengthening teachers' test construction skills may have greater effect when school leaders simultaneously clarify instructional goals, coordinate curriculum and assessment, monitor learning, and create a climate that values professional development. Because the mediation was partial rather than full, other mechanisms also likely matter, including teacher self-efficacy, professional learning, workload, collaboration, and school culture. Even so, the present evidence supports the strategic value of combining assessment-focused teacher development with school-based instructional management reforms.

5. Conclusion

The study concludes that teachers in the sampled public elementary schools reported extensive test construction skills and very extensive levels of both critical thinking motivation and instructional management. Test construction skills, instructional management, and critical thinking motivation were all strongly and positively associated. More importantly, instructional management partially mediated the relationship between test construction skills and critical thinking motivation. This

means that teachers' assessment-related competence contributes directly to stronger motivation for critical thinking, while part of that contribution also operates through the quality of instructional management within the school. The findings support the need for integrated professional development that strengthens classroom assessment practices alongside instructional leadership, curriculum coordination, and school learning climate.

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Conflict of Interest Statement

The authors declare no conflict of interest.

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