



Construct and Convergent Validities and Reliabilities of a Trait Emotional Intelligence Scale in Teacher Leadership

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Abstract

Teacher leadership emerges as a powerful force shaping the trajectory of schools and student outcomes. Central to effective teacher leadership is trait emotional intelligence (trait EI), which influences how teacher-leaders inspire, collaborate, and guide colleagues and students. This study addresses a notable research gap by validating a trait EI scale adapted to the unique demands of teacher leadership. Data were collected from a sample of 83 teacher-leaders (Males = 73, Females = 10 females) from a polytechnic in the Northeast region of Nigeria. JASP and SmartPLS were used in analysing the data collected. The results indicate that the adapted trait EI scale has excellent construct and convergent validities. It is also similarly reliable as an instrument for assessing teacher-leaders' trait EI. The study contributes to the field of educational leadership assessment by establishing the validity and reliability of the adapted trait EI scale for assessing teacher-leaders' emotional self-efficacy.

Keywords: *Trait Emotional Intelligence, Teacher Leadership, Construct Validity, Convergent Validity, Internal Consistency Reliability.*

Introduction

The higher educational industry is continually evolving, with teachers occupying a central role that extends beyond traditional pedagogical responsibilities into the domain of leadership (Cozza *et al.*, 2023; Hamdan *et al.*, 2020). Hence, they are called teacher-leaders (Vieyra and Hite, 2023). These teacher-leaders, be they department heads, curriculum coordinators, or instructional coaches, play a pivotal role in shaping school culture, fostering professional development, and ultimately impacting student outcomes (Zhang *et al.*, 2021). Yet, the domain of teacher leadership is not solely defined by administrative tasks and instructional competencies. It has its own peculiar emotional underbelly. Teacher-leaders typically encounter considerable emotional demands in their roles (Chen *et al.*, 2021; Han *et al.*, 2021). Teacher-leadership is a multifaceted role that often entails navigating a complex web of interpersonal relationships, addressing diverse student needs, collaborating with colleagues, and managing educational initiatives (Pan *et al.*, 2023; Song and Rizal, 2023). In the pursuit of these responsibilities, teacher-leaders routinely encounter various emotionally demanding situations. They may need to mediate conflicts among staff members, provide emotional support to students facing academic or personal challenges, or manage the stress associated with curricular changes and administrative duties (Khatri *et al.*, 2021). The effectiveness of teacher-leaders in these emotionally charged scenarios is intrinsically linked to their emotional intelligence—specifically, their capacity to perceive and understand the emotions of themselves and others, manage emotional responses, and leverage emotions to facilitate constructive interactions (Eryilmaz and Kara, 2017).

Trait emotional intelligence (trait EI) serves as the foundation upon which teacher-leaders can harness their emotional competencies to build trust, inspire collaboration, and nurture a positive

school culture (Petrides *et al.*, 2019). Without this emotional acumen, teacher-leaders may find it challenging to navigate the intricacies of their roles, ultimately limiting their capacity to lead effectively and provide the emotional support and guidance required in educational settings. Thus, Trait EI becomes not only a valuable asset but a necessity for teacher-leaders as they grapple with the emotional demands of their pivotal roles in education (Salisu, 2023). Trait Emotional Intelligence (Trait EI) represents the psychological construct that encapsulates an individual's ability to recognize, understand, manage, and harness emotions, both in themselves and in their interactions with others. In the context of teacher leadership, where communication, motivation, and collaboration are paramount, emotional intelligence takes on a particularly critical role.

However, the absence of a trait EI scale tailored for the specific context of teacher-leadership represents a significant research gap that has not yet been adequately addressed (Salisu *et al.*, 2020). In educational settings, where the role of teacher-leaders is paramount in shaping school culture, fostering professional growth, and ultimately influencing student achievement, measuring the nuances of EI becomes imperative (Nasir *et al.*, 2022). The generic EI assessments often fail to capture the nuanced emotional competencies that are crucial for teacher-leaders in their multifaceted roles (Hajncel and Vučenović, 2020). Consequently, a lack of a domain-specific measurement tool has hindered the in-depth exploration of the EI attributes that are most relevant and impactful in teacher leadership. This research gap underscores the need for a finely tuned, context-specific trait EI scale, designed to unveil the emotional capabilities and tendencies unique to teacher-leaders, and to unlock a deeper understanding of their role in school improvement and the enhancement of educational outcomes. This study is a continuation in that regard (see: Salisu *et al.*, 2020).

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This study validates an adapted trait EI scale designed to capture the subtle nuances of emotions in teacher leadership. Through an investigation into construct, convergent validity, and reliability, this study endeavours to bridge the gap in educational literature—a deficiency of a tailored trait EI assessment tool designed to reflect the unique demands and competencies of teacher-leaders. The objective is not merely the validation of a measurement instrument but the unlocking of a new dimension of understanding and empowering educational communities to nurture and amplify the impact of their teacher-leaders through heightened EI.

Highlights of the Literature

The concept of EI has been a prominent subject of research in the field of leadership (Yawson and Lewis, 2023). EI refers to the capacity to recognise, understand, and manage one's own emotions and the emotions of others (Antonakis and Dietz, 2010). In the context of leadership, it has gained recognition as a critical factor influencing leadership effectiveness (Saha *et al.*, 2023). Studies across various domains have established a significant connection between high levels of Emotional Intelligence and effective leadership (Coronado-Maldonado and Benítez-Márquez, 2023; Magny and Todak, 2021; Miao *et al.*, 2021; Ogurlu, 2021; Quílez-Robres *et al.*, 2023; Zhang and Adegbola, 2022). Leaders with strong emotional competencies are often better at managing conflicts, building strong relationships (Schlaerth *et al.*, 2013), and making well-informed decisions (Dilawar *et al.*, 2019). This body of research underscores the importance of EI in leadership roles.

One important type of EI is trait EI (the other is ability EI) (Naqvi and Siddiqui, 2023), which represents an individual's emotional characteristics and dispositions. Trait EI comprises a range of emotional constructs, including “emotional awareness, emotional regulation, social competence, emotional autonomy, and competence for life and well-being” (López-Cassà *et al.*, 2022, p. 6). Petrides and Furnham (2000) have identified fifteen facets comprising their TEIQue (Trait Emotional Intelligence Questionnaire), which is arguably the benchmark measure of the trait EI (Siegling *et al.*, 2014). These include adaptability, assertiveness, emotion expression, emotion management (others), emotion perception (self and others), emotion regulation, impulse control, relationships, self-esteem, self-motivation, social awareness, stress management, trait empathy, trait happiness, and trait optimism (Petrides and Mavroveli, 2018). Understanding trait EI is vital in the context of leadership, as it allows for a more in-depth exploration of how emotional traits impact leadership behaviours. Studies have identified various domains within trait EI, each of which contributes uniquely to leadership effectiveness (Salisu and Awang, 2016). These domains include self-emotion appraisal, other-emotion appraisal, use of emotions, and regulation of emotions. Researchers have sought to investigate which of these trait EI domains are most relevant and influential in different leadership contexts, including education.

The application of trait EI in the field of education follows the realisation that teachers, being influential figures in students' lives, are expected to not only impart knowledge but also provide emotional support and guidance (Sánchez-Pujalte *et al.*, 2021). Effective teachers must be emotionally intelligent, enabling them to manage classroom dynamics, engage students, and cultivate a positive learning environment (Anwar *et al.*, 2021; Hu, 2023; Papoutsis *et al.*, 2023). Studies in educational leadership have recognised the significance of EI among teachers. Teachers with

high EI are more adept at addressing the emotional needs of their students and colleagues (Custadio, 2020). They can navigate challenging situations with greater composure and empathy (Savchenkov, 2018). As such, emotional competencies are regarded as essential qualities for educators who take on leadership roles within schools and other educational institutions.

A teacher-leader's trait EI is an integral part of their effectiveness in educational leadership roles. It encompasses a range of emotionally driven attributes that distinguish them as empathetic, adaptable, and skilled in interpersonal interactions. A teacher-leader's trait EI influences their capacity to understand and manage their own emotions, enabling them to maintain composure in challenging situations, make well-informed decisions, and lead by example (Isensee, 2017). Also, their ability to empathize with colleagues and students fosters a supportive and emotionally nurturing school environment, facilitating productive teamwork and enhancing overall educational outcomes. In essence, a teacher-leader's trait EI is a cornerstone of their leadership style, impacting not only their own professional growth but also the well-being and development of the educational community they serve. Hence, there is the need to adapt existing generic measures of trait EI to align with the contextual peculiarities of teacher leadership (Hajnel and Vučenović, 2020; Salisu *et al.*, 2020).

Methodology

The survey method was employed as the primary data collection technique in this research. Through the distribution of an adapted questionnaire, teachers in leadership roles within educational institutions, introspectively provided responses on their trait EI (Seager, 2002; Tran and Lamplmayr, 2012). This method enabled the systematic collection of quantitative data, fostering a comprehensive analysis of the specific emotional traits and their association with teacher leadership behaviours within the educational setting.

The study involved teacher-leaders selected from a polytechnic in Northeast Nigeria. A purposive sampling technique was used to ensure that the sample consists of individuals actively engaged in leadership roles within their schools (Sibona *et al.*, 2020). Specifically, heads of departments and teachers with additional leadership responsibilities (such as Departmental Examination Officers) were targeted for inclusion in the study. The total population size N of teacher-leaders was determined to be 113. The desired level of confidence (e) was set at 0.05 to achieve a 95% confidence level. Yamane's (1973) formula, $n = \frac{N}{1+Ne^2}$, was employed to calculate the sample size n . The result yielded a sample size n of approximately 83 teacher-leaders, which was deemed sufficient to achieve a 95% confidence level in our study.

Data collection in this study was facilitated through the adoption of a modified instrument comprising 15 positively worded items sourced from the Trait Emotional Intelligence Questionnaire (TEIQue) (Petrides *et al.*, 2019). These items were selected to assess the respondents' self-reported trait EI (see Appendix for the scale items). The data collection process involved respondents rating their responses using a 7-point Likert scale (García-Pérez, 2023), with response anchors ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). JASP and SmartPLS were used in conducting the descriptive and inferential analyses, respectively. Descriptive statistics, (means, standard deviations, skewness and kurtosis) were calculated to provide a summary of the collected data. Inferential statistics were employed to examine the measurement model of the scale.

Results

Descriptives

The demographic data provided in Table 1 related to tenure and age of the respondents, stratified by gender (Males = 73, Females = 10 females). In terms of tenure, males exhibit a slightly higher mean tenure of 12.40 years compared to females with a mean tenure of 8.10. The overall mean tenure for all respondents is 11.88, suggesting that, on average, males have worked longer than the female respondents. The SD for males is 8.91, while for females, it is 5.59, with an overall SD = 8.67. This SD reflects moderate variability in tenure across the entire dataset. Similarly, regarding age, males have a mean age of 41.59 years, which is slightly higher than the mean age of 37.80 for females: the overall mean age is 41.13 years. The SD for males in terms of age is 9.69, while for females, it is 4.76, with an overall SD of 9.29. This SD indicates moderate variability in age among all respondents.

The data in Table 2 represents the responses to 15 items measuring trait EI by survey respondents. The mean scores, ranging from 4.30 to 4.97, suggest that respondents, on average, moderately to strongly endorse these statements related to emotional intelligence. For example, the item TEI05 indicates strong agreement, suggesting the ability to influence others' emotions, while TEI12 reflects comparatively lower agreement regarding

personal strengths and happiness. The standard error of the mean (SEM) values reveals the precision of sample means, with TEI11 showing stability and TEI05 displaying more variability. SD values indicate the spread of responses, with TEI11 having less variability and TEI05 showing greater variability. Variance demonstrates differences in response spread. Skewness values suggest varying degrees of asymmetry in the data distribution, while kurtosis values indicate the shape of the distribution. The Shapiro-Wilk test results indicate that the normality assumption holds for some items (e.g., TEI01, TEI04, TEI15, TEI07, TEI11), while others significantly deviate from a normal distribution (e.g., TEI02, TEI09, TEI13, TEI05, TEI08, TEI14). For a few variables (e.g., TEI03, TEI12, TEI10), the departure from normality is not as strong but still noteworthy.

Table 1. Respondents Demographics

	Tenure			Age		
	Male	Female	Total	Male	Female	Total
Frequency	73	10	83	73	10	83
Mean	12.40	8.10	11.88	41.59	37.80	41.13
Std. Deviation	8.91	5.59	8.67	9.69	4.76	9.29

Table 2. Items Descriptive Statistics

Items	Concentration		Dispersion		Shape of Dataset		Range		Shapiro-Wilk Test	
	\bar{x}	SE	SD	Var.	Skewness	Kurtosis	Min.	Max	Scores	p-Value
TEI01	4.50	0.13	1.20	1.44	-0.19	-0.06	1.27	6.91	0.98	0.21
TEI02	4.64	0.13	1.21	1.45	0.21	-0.34	1.70	7.00	0.96	7.92×10^{-3}
TEI03	4.66	0.12	1.13	1.27	-0.10	0.36	1.10	7.00	0.97	0.04
TEI04	4.69	0.12	1.08	1.16	0.24	-0.27	2.08	7.00	0.98	0.43
TEI09	4.93	0.12	1.12	1.26	-0.06	-0.58	2.10	7.00	0.96	0.01
TEI12	4.30	0.11	0.99	0.98	0.20	0.39	1.56	6.56	0.97	0.03
TEI13	4.70	0.15	1.35	1.81	-0.18	-0.06	1.00	7.00	0.96	0.02
TEI15	4.37	0.11	0.96	0.92	-0.16	0.69	1.56	6.56	0.98	0.13
TEI05	4.92	0.16	1.43	2.03	-0.28	-0.24	1.00	7.00	0.95	1.65×10^{-3}
TEI06	4.91	0.11	0.99	0.98	-0.15	-0.62	2.44	7.00	0.98	0.24
TEI07	4.56	0.12	1.13	1.27	-0.10	0.27	1.27	7.00	0.98	0.25
TEI08	4.89	0.15	1.41	1.99	-0.30	-0.83	1.22	7.00	0.96	9.26×10^{-3}
TEI10	4.55	0.14	1.26	1.60	-0.10	-0.45	1.40	7.00	0.97	0.07
TEI11	4.70	0.09	0.78	0.61	0.27	0.20	2.78	7.00	0.99	0.49
TEI14	4.97	0.14	1.26	1.59	0.02	-1.32	2.89	7.00	0.94	< .001

Validities and Reliabilities

Two types of validities were assessed: construct and convergent validities, with the former measuring validity at item level and the latter at construct level (Rust *et al.*, 2021). The construct validity of the trait EI scale was evaluated through factor loading scores (Peterson, 2000), while convergent validity was assessed using Average Variance Extracted (AVE) scores (dos Santos and Cirillo, 2021) for each of the 15 items. As shown in Table 3, the factor loadings, which gauge the strength of the relationship between items and the underlying Trait EI construct, consistently demonstrated robust associations, underscoring the items' effectiveness in measuring trait EI. Particularly noteworthy were items TEI03, TEI06, TEI09, and TEI01, which exhibited high factor loadings that met Zulkifli *et al.*'s (2023) threshold of ≥ 0.70 , thereby affirming their substantial contribution to the measurement of trait EI and confirming construct validity. Also, the AVE scores, representing the extent to which the items collectively account for

the variance in the construct, generally surpassed the accepted threshold of $AVE \geq 0.5$ (dos Santos and Cirillo, 2021), signifying strong convergent validity. These results collectively support the scale's robust construct validity.

Further, the SmartPLS output in Table 3 pertaining to the internal consistency reliability of the trait EI scale using multiple reliability indices, including Composite Reliability (Werts *et al.*, 1974), Cronbach's α (Cronbach, 1951), McDonald's ω (McDonald, 2014), and Guttman's λ^2 (Guttman, 1945), all demonstrate exceptional reliability (Sijtsma and Pfadt, 2021; Taber, 2017; Zinbarg *et al.*, 2005). This multi-index approach was followed due to the inadequacies associated with some of the reliability indices, especially Cronbach's alpha (Cheung *et al.*, 2023). Thus, the indices employed are meant to complement and strengthen each other. The Composite Reliability of 0.960 reflects that the observed scores on the items consistently and accurately represent the underlying trait EI construct, with minimal measurement error.

Similarly, the Cronbach's α coefficient of 0.961 and McDonald's ω of 0.963 affirm the high level of internal consistency, highlighting the items' strong correlations with each other. Moreover, Guttman's λ^2 , with a value of 0.964, suggests that the majority of the variability in the trait EI scale is attributable to genuine differences in emotional intelligence rather than measurement error.

These results collectively endorse the trait EI scale as a reliable and robust instrument for assessing emotional intelligence within the context of teacher leadership, instilling confidence in the scale's capacity to deliver consistent and dependable measurements of Trait EI.

Table 3. Validity and Reliability Assessments

Items	Validity Indices			Reliability Indices		
	Factor Loadings	Ave. Var. Extracted	Composite Reliability	Cronbach's Alpha (α)	*McDonald's Omega (ω)	*Guttman's Lambda-2 (λ^2)
TEI01	0.830					
TEI02	0.815					
TEI03	0.863					
TEI04	0.785					
TEI05	0.783					
TEI06	0.843					
TEI07	0.766					
TEI08	0.688	0.615	0.960	0.961	0.963	0.964
TEI09	0.866					
TEI10	0.795					
TEI11	0.735					
TEI12	0.685					
TEI13	0.808					
TEI14	0.792					
TEI15	0.671					

* McDonald's ω and Guttman's λ^2 were computed in JASP.

The study results contemplate several implications. First, establishing some of the psychometrics of a trait EI scale tailored to teacher-leader behaviours contributes towards research on the impact of EI on educational leadership. It provides one more tool that practitioners and researchers could employ in targeted training and development initiatives, capitalising on the variations in trait EI abilities among teacher-leaders. Second, the study underscores the necessity of personalised interventions. Given the significant differences in trait EI abilities observed, a one-size-fits-all approaches to enhancing EI in teacher-leaders may not be as effective as tailored interventions that address individual strengths and weaknesses. Thirdly, these results imply that some teacher-leaders may excel in specific facets of emotional intelligence, such as influencing the emotions of others, while lagging in areas like personal happiness. Identifying these nuances equips educational leaders and policymakers with the knowledge required to cultivate well-rounded emotional intelligence competencies. The implications extend to the broader field of leadership and emotional intelligence research. The scale assessed could serve as input towards developing and validating domain-specific measurement tools in other domains and professions.

Limitations

While this study contributes to assessment of trait EI in teacher-leadership, it is essential to acknowledge several limitations that should be considered. Firstly, the study's sample size may be limited in representing the entire population of teacher-leaders. A

larger and more diverse sample could enhance the generalizability of the findings. Secondly, this research focused solely on the validation and reliability aspects of the trait EI Scale. Future studies might explore the scale's predictive validity by examining its relationship with teacher-leadership behaviours and outcomes. Thirdly, the study adopted a quantitative approach, potentially overlooking valuable qualitative insights that could provide a richer understanding of teacher-leaders' EI. Fourthly, the study's reliance on self-report measures introduces the possibility of response bias and social desirability effects. Future research could employ multi-source assessments, including peer or supervisor evaluations, to offer a more comprehensive view of teacher-leaders' EI. Lastly, while the scale exhibited high internal consistency, it is important to consider the cultural and contextual nuances that may impact the measurement of EI, as this study primarily focused on one specific educational context. Recognising these limitations, future research can build upon this foundation to further enrich our understanding of trait EI in teacher-leadership and address these potential areas of improvement and expansion.

Conclusion

This study examined the validity and reliability of a trait EI scale specifically designed for the domain of teacher-leadership. The findings have not only underlined the significance of EI in educational leadership but have also confirmed the scale's robust internal consistency and reliability. The exceptional results across

multiple indices, including Composite Reliability, Cronbach's α , McDonald's ω , and Guttman's λ^2 , offer confidence in the scale's ability to provide consistent and trustworthy measurements of EI in teacher-leadership context. These outcomes have far-reaching implications for the development of tailored training programmes, interventions, and future research, thereby enhancing assessment of EI's role in educational leadership.

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Appendix

Adapted Items of the Trait Emotional Intelligence Questionnaire-Short Form (TEIQUE-SF)

Q/N	Item Statements	Facets
TEI02	I'm highly motivated when dealing with colleagues, students and community members.	Self-Motivation
TEI01	I find it easy to express my emotions in words.	Emotion Expression
TEI15	Others admire me for being relaxed with colleagues, students and community members.	Impulsiveness (Low)
TEI09	On the whole, I am pleased with my life as an academic (teacher-leader).	Self-Esteem
TEI12	I believe I am full of personal strengths to survive, thrive and succeed as a teacher-leader in higher educational institutions.	Trait Happiness
TEI13	I generally believe that things will work out fine in my life and work despite the challenges of the moment.	Trait Optimism
TEI03	I can deal effectively with colleagues, students and community members.	Assertiveness
TEI04	I feel that I am a student-centred academic, empowering, collaborative, and relationship-oriented.	Relationship
TEI11	I often pause and think about my feelings concerning my role as a teacher-leader in higher education.	Emotion Perception (Self & Others)
TEI05	I'm usually able to influence the way colleagues, students and community members feel about achieving the goals of higher education.	Emotion Management (Others)
TEI08	I'm usually able to find ways to control my emotions when dealing with students, colleagues and community members.	Emotion Regulation
TEI10	I would describe myself as a good negotiator when negotiating the multiple roles of teacher-leaders in higher education.	Social Awareness
TEI06	On the whole, I am able to deal with stress arising from educational reforms and workplace challenges.	Stress Management
TEI07	I'm normally able to "get into the shoes" of colleagues, students and community members and experience their emotions.	Trait Empathy
TEI14	Generally, I'm able to adapt to new environments dictated by reforms and changing nature of higher education.	Adaptability