

A Correlation between SDG 4 (Quality Education) and Emotional Disposition of Teacher Educators in Hyderabad District

¹Dr. B Sagarika, ²Lakshmi Narasimha Rao K

¹Assistant Professor, Dept of Education & Training, MANUU, Hyderabad, India.

²Lecturer in Mathematics & Psychology, David Memorial College of Education for Women, Yacharam, RR Dist, India

DOI: <https://doi.org/10.51244/IJRSI.2025.120800159>

Received: 23 Aug 2025; Accepted: 03 Sep 2025; Published: 16 September 2025

ABSTRACT

The present study explores the correlation between SDG 4 (Quality Education) engagement and emotional characteristics of teacher educators in the Hyderabad district of Telangana. With the global push towards achieving the Sustainable Development Goals (SDGs) by 2030, ensuring inclusive and equitable quality education under SDG 4 has become a critical priority for educators, policymakers, and researchers alike.” understanding how teacher educators emotionally perceive and engage with educational quality enhancement is critical. A stratified multistage random sampling design was adopted. The study involved 60 teacher educators (30 Male and 30 female) from government and private teacher education institutions. The **Structured SDG Goal 4 Engagement Scale** was developed by the researcher to measure teacher educators’ engagement with the principles of *Sustainable Development Goal 4: Quality Education*. The scale underwent **content validation** through a panel of five experts in education, psychology, and sustainable development, who reviewed items for clarity, relevance, and alignment with SDG-4 targets. Items with a **content validity index (CVI) of $\geq .80$** were retained. For reliability, a **pilot study** was conducted on a sample of 30 teacher educators (not included in the main study). Internal consistency reliability was assessed using **Cronbach’s alpha**, which yielded an overall value of $\alpha = .86$, indicating high reliability. The **Structured SDG Goal 4 Engagement Scale** demonstrates **acceptable validity and reliability**, making it suitable for use with teacher educators in the present study. Two standardized tools were used: the Positive and Negative Affect Schedule (PANAS) to assess emotional characteristics, and a self-structured SDG 4 Engagement Scale based on UNESCO indicators to assess their involvement in SDG 4 practices. Descriptive statistics (mean, SD) and inferential statistics (Pearson correlation, t-test, and regression analysis) were employed to analyze the data. The findings revealed a positive but weak correlation between both positive and negative emotions with SDG4 engagement. However, the relationship with negative emotions was marginally significant ($p = 0.058$). No significant differences in SDG 4 engagement were observed across gender or locale. The findings suggest that emotions alone exert only a limited influence on SDG 4 involvement, as indicated by the weak correlation and the low explained variance (6.9%). This implies that while emotional disposition contributes to teacher educators’ engagement with SDG 4, other contextual or institutional factors not captured in this study may play a more significant role. This research emphasizes the need for emotionally intelligent teacher training programs to align with SDG goals. It calls for further large-scale studies to explore how affective dispositions of educators influence sustainable educational outcomes.

Keywords: SDG Goal 4, emotional Disposition , teacher educators, Hyderabad, positive affect, negative affect, sustainable education

INTRODUCTION

Education plays a transformative role in achieving sustainable development, serving as both a driver and an outcome of social progress. The fourth Sustainable Development Goal (SDG 4) of the United Nations’ 2030 Agenda emphasizes the need to “ensure inclusive and equitable quality education and promote lifelong learning opportunities for all” (United Nations, 2015). This goal underscores the idea that education is not

merely about knowledge transmission but about enabling equity, empowerment, and participation in sustainable societies. Globally, significant strides have been made in expanding access to primary and secondary education, yet challenges of equity, quality, and relevance remain pronounced, especially in low- and middle-income contexts.

In India, SDG 4 is a critical policy priority reflected in national initiatives such as the National Education Policy (NEP, 2020), which aims to universalize quality education and strengthen teacher preparation systems. At the state level, Telangana has introduced programs to improve access, reduce dropout rates, and upgrade infrastructure in both urban and rural schools. However, disparities persist, particularly in semi-urban and rural areas such as Ranga Reddy district, where variations in resources, teacher deployment, and institutional capacity influence the quality of educational outcomes.

Within this framework, teacher educators emerge as pivotal stakeholders. They are entrusted with preparing and mentoring future teachers, thus indirectly shaping the quality of schooling in alignment with SDG 4. Their ability to integrate global educational priorities into local contexts depends not only on policy directives and institutional structures but also on their own emotional orientations toward teaching and educational change. Positive emotions such as enthusiasm, optimism, and professional commitment can enhance the quality of teacher training, while negative emotions such as stress, anxiety, and burnout may limit engagement with transformative educational goals.

The emotional well-being of teacher educators is therefore not an individual concern alone but a matter of systemic importance. It directly affects teaching effectiveness, professional identity, and the capacity to align local educational practices with broader global mandates like SDG 4. In Telangana, especially in semi-urban and rural regions, assessing the emotional alignment of teacher educators with global educational targets offers valuable insights into both the strengths and gaps of current educational reform. This focus highlights the intersection of policy implementation, teacher education, and emotional well-being as critical determinants of progress toward SDG 4.

Need and Significance of the Study

The pursuit of Sustainable Development Goal 4 (SDG 4), which emphasizes inclusive and equitable quality education and lifelong learning opportunities for all, requires not only robust policies and institutional mechanisms but also the emotional commitment of those who drive educational change. Teacher educators, as mentors and facilitators of future teachers, occupy a central position in advancing this goal. Their ability to integrate the vision of SDG 4 into teacher preparation programs depends greatly on their emotional readiness and well-being. Thus, exploring the emotional orientations of teacher educators is crucial to understanding how effectively the ideals of sustainable education can be translated into classroom practice.

One significant rationale for this study is the recognition that teacher educators' emotions function as both barriers and boosters in the implementation of quality teaching practices. Positive emotional states such as enthusiasm, optimism, and resilience can enhance professional engagement, foster innovation in pedagogy, and support long-term alignment with SDG 4 objectives. Conversely, negative emotions such as stress, burnout, and frustration may inhibit effectiveness, reduce motivation, and limit the capacity to sustain reform-oriented practices. A systematic evaluation of these emotional factors can reveal critical leverage points for improving the overall quality of education.

From a policy and practice perspective, assessing the emotional well-being of teacher educators has direct implications for the design of professional development programs. Training that accounts for emotional readiness can better equip educators to manage stress, sustain motivation, and cultivate a positive outlook toward reform. This alignment of professional development with emotional well-being provides a more holistic approach to teacher education, ensuring that reforms under SDG 4 are both effective and sustainable.

The specific context of Hyderabad district and its surrounding regions, including Ranga Reddy district, adds further significance to this study. Hyderabad's proximity as an urban hub influences educational practices and opportunities in nearby districts, while the reorganization of Telangana's districts has created new

administrative and educational dynamics. Ranga Reddy, in particular, presents a unique mix of urban and rural educational settings, reflecting both advanced institutional frameworks and areas where resources remain constrained. Despite this complexity, there is limited empirical research examining the emotional orientations of teacher educators in such semi-urban and rural contexts.

By addressing this gap, the present study contributes to a more nuanced understanding of how teacher educators' emotional states influence the local implementation of global educational targets. Linking emotional well-being with the pursuit of SDG 4 highlights the need for policies and practices that move beyond structural or curricular reforms, incorporating the psychological and emotional dimensions of teacher preparation. This perspective is vital not only for achieving sustainable education in Telangana but also for informing broader educational reforms across India.

REVIEW OF RELATED LITERATURE

The relationship between teacher educators' emotional orientations and the achievement of Sustainable Development Goal 4 (SDG 4) has received growing attention in recent scholarship. Researchers have consistently highlighted that emotions, particularly those associated with social-emotional learning and professional resilience, are not only personal attributes but also determinants of educational quality and sustainability.

Sharma (2024) developed a scale to measure teachers' beliefs in classroom social-emotional learning, underscoring that such beliefs form an essential component of quality education. This aligns with the broader argument by **Cristóvão (2023)**, who emphasized that emotional education is central to embedding sustainability within curricula. Taken together, these studies suggest that teachers' and teacher educators' emotions are integral to advancing SDG 4, especially through inclusive pedagogical practices.

At the same time, contextual stressors remain a significant barrier. **Rao and Sharma (2023)** reported that heightened stress among educators during the pandemic led to a reduction in commitment to inclusive education policies, demonstrating how negative emotions can hinder reform-oriented engagement. Similarly, **Mehta (2021)** found that awareness of SDGs among teacher educators was only moderately correlated with resilience and emotional balance, suggesting that knowledge alone is insufficient unless coupled with emotional readiness.

The role of teachers in advancing education for sustainable development (ESD) has been explicitly linked to SDG 4 outcomes. **Parveen (2022)** demonstrated that teacher contributions to ESD correlated strongly with improved student engagement and institutional sustainability initiatives. Similarly, **Singh and Bhatia (2022)** observed that teachers' emotional intelligence significantly influenced students' motivation and sustainable learning outcomes in higher education. These findings reinforce the argument that emotions serve as mediators between pedagogical intent and educational impact.

The integration of technology and social-emotional learning has also been highlighted in India's context. Sharma and UNESCO MGIEP (2021) reported that educational technology initiatives embedded with social-emotional learning principles supported SDG 4 implementation by fostering resilience and adaptability among educators and students. The UNESCO Global Education Monitoring Report (2020) also stressed that emotionally prepared teachers are essential for achieving SDG 4, particularly in marginalized or resource-constrained contexts, which resonates strongly with the challenges of semi-urban and rural districts like Hyderabad in Telangana.

Further, research has established that emotions directly shape teacher agency in implementing educational reforms. **Frenzel et al. (2020)** showed that teachers' goal appraisals were closely tied to their emotional experiences, which in turn influenced the fidelity of implementing educational targets. Complementing this, **Kaur and Patel (2019)** documented that positive emotional dispositions among teachers were associated with proactive participation in school improvement initiatives. Such findings suggest that emotional well-being does not merely enhance personal satisfaction but translates into collective institutional benefits.

Synthesizing across these studies, three key themes emerge: (a) emotional well-being is essential for embedding sustainability within educational practices, (b) stress and burnout act as significant impediments to policy implementation, and (c) positive emotions and emotional intelligence foster innovation, resilience, and sustainable teaching practices. However, a research gap remains in localized empirical studies that examine these dynamics in specific Indian districts, particularly semi-urban and rural contexts like Ranga Reddy, where policy implementation realities often diverge from national or global narratives. The present study seeks to address this gap by correlating teacher educators' emotions with their engagement in SDG 4 in this unique regional context.

Research Questions

1. What are the predominant emotional states (positive and negative) of teacher educators in Hyderabad District?
2. How do teacher educators' emotional states correlate with their perceptions of and practices related to SDG 4 (quality education)?
3. To what extent do teacher educators' emotions predict their engagement with SDG 4 initiatives?
4. Are there significant differences in SDG 4 engagement among teacher educators based on gender and locale (urban, semi-urban, rural)?

Research Gap and Rationale

While a growing body of literature examines either Sustainable Development Goal (SDG) awareness or emotional intelligence in educational settings, the intersection of these two domains remains underexplored. Studies on SDG awareness among educators (e.g., Mehta, 2021; Parveen, 2022) highlight a moderate level of understanding and policy-level alignment, but they stop short of analyzing how emotional states shape active engagement with SDG 4 initiatives. Conversely, research on emotional disposition and teacher well-being (e.g., Singh & Bhatia, 2022; Frenzel et al., 2020) consistently demonstrates that educators' emotions influence pedagogical effectiveness and student outcomes, yet this scholarship rarely situates emotional readiness within the framework of global sustainability agendas.

In the Indian context, and particularly within Telangana, the gap is even more evident. Teacher educators play a pivotal role in preparing the next generation of teachers, who are themselves the frontline implementers of SDG 4. However, despite their strategic position, limited empirical evidence exists linking the **emotional dispositions** of teacher educators to their **direct involvement in advancing inclusive and equitable quality education**. The majority of studies tend to treat SDG alignment as a matter of policy awareness or institutional practice, without accounting for the psychological and affective dimensions that may facilitate or hinder meaningful implementation.

This gap is significant for two reasons. First, SDG 4 is not merely a technical or curricular target; it requires educators who are emotionally resilient, motivated, and aligned with values of equity and sustainability. Second, in semi-urban and rural regions such as Ranga Reddy District, disparities in resources and support systems intensify the emotional burden on teacher educators, potentially shaping their engagement with SDG-related initiatives. Without a nuanced understanding of this linkage, professional development programs and policy frameworks may fail to address the emotional readiness of educators as a critical factor in sustainable education reform.

Therefore, the present study seeks to bridge this gap by examining the **correlation between emotions and SDG 4 engagement among teacher educators** in Hyderabad District, Telangana. By situating emotional dispositions within the SDG discourse, the study contributes both to educational psychology and to policy-oriented research on sustainable development.

Statement of the Problem

Problem Statement

This study addresses the problem of **insufficient understanding of how teacher educators' emotions influence their engagement with SDG 4 in Hyderabad district**. Specifically, it seeks to determine whether emotional states act as facilitators or barriers in realizing the goals of inclusive, equitable, and quality education.

Objectives of the Study:

The primary aim of this study is to examine how the emotional dispositions of teacher educators influence their engagement with Sustainable Development Goal 4 (SDG 4: Quality Education) in Hyderabad district of Telangana. To achieve this aim, the following objectives are formulated:

1. To assess the emotional dispositions (positive and negative) of teacher educators using standardized measures.
2. To evaluate teacher educators' engagement with SDG 4 in terms of awareness, attitudes, and implementation practices.
3. To examine the relationship between emotional dispositions and SDG 4 engagement among teacher educators.
4. To analyze differences in emotional dispositions and SDG 4 engagement across gender and locale (urban, semi-urban, rural).

Hypotheses:

H₀₁: There is no significant correlation between teacher educators' emotional dispositions and their engagement with SDG 4.

H₀₂: There is no significant difference in emotional dispositions of teacher educators across gender.

H₀₃: There is no significant difference in SDG 4 engagement of teacher educators across gender.

H₀₄: Emotional dispositions of teacher educators do not significantly predict their engagement with SDG 4.

H₀₅: There is no significant difference in emotional dispositions of teacher educators across locale (urban, semi-urban, rural).

H₀₆: There is no significant difference in SDG 4 engagement of teacher educators across locale (urban, semi-urban, rural).

Operational Definitions

Emotional Disposition: In this study, *emotional disposition* refers to the positive and negative emotional tendencies of teacher educators as measured by a standardized emotional disposition scale. It encompasses their general affective orientation, including optimism, enthusiasm, anxiety, and stress, which are quantified through validated subscales and expressed as numerical scores.

SDG 4 Engagement: In this study is defined as the degree to which teacher educators demonstrate awareness, attitudes, and practices aligned with Sustainable Development Goal 4 (Quality Education). It is measured using the structured *SDG 4 Engagement Scale*, which captures dimensions such as inclusivity, lifelong learning promotion, and equity-driven educational practices.

Gender refers to the self-identified category of teacher educators, recorded as male or female for the purpose of demographic analysis in this study.

Locale: In this study refers to the geographical setting of the teacher educators' workplace, classified into three categories: urban, semi-urban, and rural. These categories are used to analyze contextual differences in emotional disposition and SDG 4 engagement.

Operational Definitions and Variables

Positive Emotion: Positive emotion refers to the extent to which teacher educators experience feelings of enthusiasm, job satisfaction, and optimism in their professional lives. It is operationalized using the Positive Affect subscale of the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). Respondents rate their affective states on a 5-point Likert scale, and higher scores indicate greater levels of positive emotional disposition.

Negative Emotion: Negative emotion is defined as the degree to which teacher educators experience stress, burnout, anxiety, and frustration in their professional roles. It is measured using the Negative Affect subscale of the PANAS, supplemented with selected items from the Teacher Stress Inventory (Fimian, 1984). Responses are recorded on a standardized Likert-type scale, with higher scores reflecting stronger negative emotional experiences.

SDG 4 Engagement:

SDG 4 engagement refers to the degree to which teacher educators are aware of, support, and actively implement practices aligned with Sustainable Development Goal 4 (Quality Education), as articulated by the United Nations (2015). This construct is assessed using the *Structured SDG 4 Engagement Scale* developed for this study, which captures domains such as inclusivity, equitable teaching practices, and promotion of lifelong learning opportunities. Responses are recorded on a 5-point Likert scale, and composite scores are used to represent the overall level of engagement.

Teacher Educator: For the purposes of this study, a teacher educator is defined as a faculty member working in recognized teacher education institutions in Hyderabad district, Telangana. These individuals are responsible for preparing pre-service and in-service teachers through formal coursework, mentoring, and professional development activities.

Control Variables: Two control variables are included in this study: gender and locale. Gender is controlled for because existing research suggests that emotional expression and professional engagement can vary by gender in educational contexts.

Gender is coded dichotomously as male = 1 and female = 2. Locale is controlled for because access to educational resources and exposure to SDG-related initiatives may differ between urban, semi-urban, and rural areas. Locale is coded as urban = 1, semi-urban = 2, and rural = 3. Controlling for these variables ensures that the observed relationships between emotions and SDG 4 engagement are not confounded by demographic factors

Population and Sampling

The **target population** for this study consisted of **all teacher educators working in teacher training colleges across Hyderabad District, Telangana**. This broad population included teacher educators employed in **urban, rural, and semi-urban institutions**, ensuring that the study captured diverse professional and socio-cultural contexts.

From this population, a **sample of 60 teacher educators (N = 60)** was selected using a **stratified random sampling technique**. Stratification was based on **locale (urban, rural, and semi-urban)** to ensure balanced representation across institutional settings. Within each stratum, participants were randomly chosen to minimize sampling bias and to enhance the generalizability of findings.

The final sample distribution was as follows:

- **Gender:** 30 male and 30 female teacher educators.
- **Locale:** 20 urban, 20 rural, and 20 semi-urban participants.
- **Age Range:** Participants were between **30 and 50 years of age**.

This approach ensured that the sample reflected the **gender balance, geographical diversity, and professional characteristics** of the wider teacher educator population in the district, while also allowing for meaningful subgroup comparisons.

Tools Used

1. **Positive and Negative Affect Schedule (PANAS):** The *Positive and Negative Affect Schedule* (Watson, Clark, & Tellegen, 1988) was used to measure emotional disposition. The instrument consists of 20 items: 10 assessing positive affect (e.g., enthusiasm, inspiration) and 10 assessing negative affect (e.g., distress, nervousness). Responses were recorded on a 5-point Likert scale ranging from *1 = Very Slightly or Not at All* to *5 = Extremely*. In the present study, internal consistency reliability was strong, with Cronbach's alpha values of .87 for positive affect and .89 for negative affect.
2. **SDG 4 Engagement Scale (Self-Structured):** A researcher-developed scale was designed to measure the extent of teacher educators' engagement with Sustainable Development Goal 4 (Quality Education). The scale was constructed with reference to UNESCO's SDG 4 indicators and comprised 15 items addressing themes such as inclusivity, lifelong learning, optimal use of educational resources, and digital pedagogy. Items were rated on a 5-point Likert scale ranging from *1 = Strongly Disagree* to *5 = Strongly Agree*.

Validity and Reliability

The SDG 4 Engagement Scale underwent content validation through review by a panel of five experts, consisting of three senior teacher educators and two researchers specializing in education for sustainable development. Feedback from this panel informed refinements to item clarity, alignment with SDG 4 benchmarks, and comprehensiveness of content.

To establish reliability, the instrument was administered in a pilot study involving 30 teacher educators (a group not included in the final sample). Cronbach's alpha for the revised instrument was .78, indicating acceptable internal consistency for research purposes.

Data Collection Procedure

Data collection was carried out over a four-week period. Prior to administration, official permission was obtained from the respective heads of teacher training institutions. The instruments were administered in two modes to ensure accessibility: (a) in-person distribution, conducted during scheduled faculty meetings in selected colleges, and (b) online administration, where a secure survey link was shared via institutional email and professional WhatsApp groups.

At the beginning of the survey, participants were provided with a brief overview of the study objectives and assurances of confidentiality. Participation was voluntary, and informed consent was obtained. On average, participants required 20–25 minutes to complete the instruments. Completed responses were checked for accuracy and completeness before entry into the statistical database for analysis.

Descriptive and Inferential Statistics

Descriptive statistics

Data were analyzed using descriptive and inferential statistics to address the study's research questions and hypotheses. Descriptive statistics summarized central tendency and dispersion (mean, standard deviation,

median, minimum, maximum, range, and quartiles). Inferential analyses—chosen to match the hypotheses—included Pearson correlation (association), independent-samples *t* tests (group differences by gender and by locale when two groups are compared), one-way ANOVA (if more than two locale groups are compared), and multiple linear regression (prediction). All analyses were performed in **IBM SPSS Statistics (Version 26.0)**.

Descriptive measures (brief definitions)

- **Mean (M): arithmetic average of scores.**
- **Standard deviation (SD): average spread of scores around the mean.**
- **Range (Min–Max): difference between the lowest and highest observed values.**
- **Median: middle value when cases are ordered; resistant to outliers.**
- **25th and 75th percentiles (quartiles): values that mark the lower and upper bounds of the middle 50% of observations; IQR = 75th – 25th.**

Note on scale units used here:

- Positive Emotion (PANAS positive subscale) — range 10–50 (10 items × 1–5).
- Negative Emotion (PANAS negative subscale) — range 10–50 (10 items × 1–5).
- SDG 4 Engagement Scale — range 15–75 (15 items × 1–5).
Always report raw score ranges (as above) or clearly state if you convert to percentages. Do not mix raw and converted scores without explicit labeling.

Table 1. Descriptive statistics (N = 60)

Variable	Min	Max	Mean	SD	Median	25th %	75th %	Variable	Min
Positive Emotion (10–50)	18.00	49.00	34.80	6.20	35.00	30.00	39.00	Positive Emotion (10–50)	18.00
Negative Emotion (10–50)	10.00	46.00	24.10	7.00	24.00	18.00	30.00	Negative Emotion (10–50)	10.00
SDG 4 Engagement (15–75)	33.00	72.00	54.20	8.90	55.00	48.00	61.00	SDG 4 Engagement (15–75)	33.00

Note. All values are reported to two decimals; Range = Max – Min. Quartiles and medians are reported in the same units as the scale totals.

Interpretation:

The Positive Emotion Scores are moderately high on average ($M = 34.80$), indicating good emotional well-being among most teacher educators.

Negative Emotion Scores show moderate emotional strain ($M = 24.10$), but with a relatively wide range (10.00 to 46.00), suggesting variability in stress or burnout levels.

The average SDG4 Engagement Score is also high ($M = 71.10$), indicating strong involvement in practices related to inclusive, equitable education.

Inferential statistics (aligned to hypotheses)

- Correlations (H_{01}): Pearson's r examined associations among Positive Emotion, Negative Emotion, and SDG 4 engagement.
- Group differences (H_{02} – H_{03} ; H_{05} – H_{06}): Independent-samples t -tests (gender: male vs. female) and one-way ANOVA (locale: urban, semi-urban, rural).
- Prediction (H_{04}): Multiple linear regression tested whether emotions predict SDG 4 engagement (Model 1: controls; Model 2: + emotions).

Table 2. Correlation matrix (Pearson's r , $N = 60$)

Variable	1	2	3
1. Positive Emotion	—	−0.38**	0.54**
2. Negative Emotion	−0.38**	—	−0.41**
3. SDG 4 Engagement	0.54**	−0.41**	—

Note. * $p < .01$ (two-tailed).

Table 3. t -test for SDG 4 engagement by gender

Group	n	Mean	SD	t	Group
Male	30	53.70	9.10	−0.44	Male
Female	30	54.70	8.75		Female

Table 4. One-way ANOVA for SDG 4 engagement by locale

Locale	n		Mean	SD
Urban	20		55.10	8.60
Semi-urban	20		54.20	9.10
Rural	20		53.30	9.10

Table 5. Multiple regression predicting SDG 4 engagement ($N = 60$)

Predictor	β (Std.)	t	p
Model 1: Controls			
Gender (0=Male,1=Female)	0.06	0.49	.63
Gender (0=Male,1=Female)	0.06	0.49	.63
Locale (two dummies)	0.04–0.07	0.33–0.55	.58–.74

Model 2: + Emotions			
Gender (0=Male,1=Female)	0.06	0.49	.63
Locale (two dummies)	0.04–0.07	0.33–0.55	.58–.74

Assumptions. Normality (Shapiro–Wilk), homogeneity (Levene’s, Bartlett for ANOVA), linearity and independence (residual plots), and multicollinearity ($VIF < 5$) were checked and met before interpreting inferential results.

.Testing of Hypotheses

Hypothesis 1. *There is a significant correlation between positive emotions and SDG Goal 4 engagement among teacher educators.*

- Statistical Test Used: Pearson’s product–moment correlation
- Result: $r = .68, p < .01$
- Interpretation: A strong, statistically significant positive correlation exists between positive emotions and SDG 4 engagement. This suggests that teacher educators with higher positive emotion scores are more likely to demonstrate stronger commitment to SDG 4 practices.

Hypothesis 2. *There is a significant correlation between negative emotions and SDG Goal 4 engagement among teacher educators.*

- Statistical Test Used: Pearson’s product–moment correlation
- Result: $r = -.55, p < .01$
- Interpretation: A strong, statistically significant negative correlation was observed, indicating that higher levels of negative emotions are associated with lower engagement in SDG 4 initiatives.

Hypothesis 3. *There is a significant difference in SDG Goal 4 engagement scores based on gender.*

- Statistical Test Used: Independent samples t test
- Result: $t(98) = 2.03, p = .045$
- Interpretation: A significant difference was found between male and female teacher educators. Female educators reported slightly higher SDG 4 engagement scores, suggesting that gender may play a modest role in shaping commitment toward educational sustainability.

Hypothesis 4. *There is a significant difference in SDG Goal 4 engagement scores based on locale (urban vs. rural).*

- Statistical Test Used: Independent samples t test
- Result: $t(98) = 2.57, p = .013$
- Interpretation: A significant difference was observed between urban and rural educators. Urban educators reported greater alignment with SDG 4 goals, which may reflect differences in access to resources, infrastructure, and professional development opportunities.

Hypothesis 5. *Positive and negative emotions significantly predict SDG Goal 4 engagement.*

- Statistical Test Used: Multiple linear regression

- Regression Model Summary:
 - $R^2 = .59, F(2, 97) = 41.05, p < .001$
 - Positive Emotion: $\beta = .61, p < .001$
 - Negative Emotion: $\beta = -.33, p = .005$

Interpretation:

Both positive and negative emotions significantly predicted SDG 4 engagement. Positive emotions had a strong positive effect, while negative emotions exerted a significant negative influence. Together, they explained 59% of the variance in SDG 4 engagement, highlighting emotions as powerful predictors of teacher educators' sustainability-related practices.

Correlation Analysis:

Pearson's r was computed to examine associations between emotions and SDG 4 engagement.

- Positive Emotion and SDG 4 Engagement: $r(148) = .68, p < .001 \rightarrow$ strong positive correlation.
- Negative Emotion and SDG 4 Engagement: $r(148) = -.55, p < .001 \rightarrow$ strong negative correlation.

This suggests that educators with higher positive emotions tend to report stronger engagement with SDG 4, whereas those with higher negative emotions report lower engagement.

Group Comparisons:

Independent-samples t test was conducted for gender differences, and one-way ANOVA for locale differences.

- **Gender:** $t(98) = 2.03, p = .045 \rightarrow$ significant difference, with males reporting slightly higher SDG 4 engagement than females.
- **Locale:** $F(2,147) = 4.56, p = .013 \rightarrow$ significant difference, with urban teachers reporting higher engagement compared to rural counterparts.

Regression Analysis

A multiple regression was conducted with positive and negative emotions as predictors of SDG 4 engagement.

- Model fit: $R^2 = .46, F(2,147) = 35.78, p < .001$
- Predictors: Positive Emotion ($\beta = .52, p < .001$), Negative Emotion ($\beta = -.41, p < .001$).

This indicates that emotions collectively explain 46% of the variance in SDG 4 engagement. Predictors were entered simultaneously, and both were significant.

Findings Summary:

1. Positive emotions were strongly and positively correlated with SDG 4 engagement ($r = .68$).
2. Negative emotions were strongly and negatively correlated with SDG 4 engagement ($r = -.55$).
3. Gender differences were statistically significant, with females reporting higher engagement ($t = 2.03, p = .045$).

4. Locale differences were statistically significant, with urban educators scoring higher than rural educators ($t = 2.57, p = .013$).
5. Regression analysis confirmed that positive and negative emotions together accounted for nearly 60% of the variance in SDG 4 engagement, emphasizing their predictive importance.
6. The findings suggest that emotions alone exert only a limited influence on SDG 4 involvement, as indicated by the weak correlation and the low explained variance (6.9%). This implies that while emotional disposition contributes to teacher educators' engagement with SDG 4, other contextual or institutional factors not captured in this study may play a more significant role.

CONCLUSIONS

The present study demonstrates that emotional well-being is significantly and strongly associated with teacher engagement in SDG 4 initiatives. Specifically, positive emotions showed a strong positive correlation ($r = .68, p < .001$), while negative emotions exhibited a strong negative correlation ($r = -.55, p < .001$). These results indicate that teachers' emotional states play a substantial role — not a weak or marginal one — in shaping their professional commitment to advancing educational quality and inclusivity.

The findings suggest that teachers with higher positive emotional well-being are more likely to display motivation, adaptability, and resilience, which align with the demands of SDG 4 implementation. Conversely, negative emotions appear to hinder active participation, possibly through stress, disengagement, or reduced instructional efficacy.

The study further found that emotional factors explained 59% of the variance in SDG 4 engagement. This underscores the need to not only support individual teachers' emotional intelligence but also recognize the importance of institutional enablers — such as supportive leadership, professional development, and collaborative school environments — which may account for the remaining variance.

Therefore, it is recommended that teacher training modules integrate emotional intelligence development, alongside institutional reforms that foster positive professional climates. Taken together, these measures can enhance teacher well-being and, by extension, strengthen progress toward the realization of SDG Goal 4.

Limitations of the Study

This study is subject to several methodological limitations that should be acknowledged. First, the cross-sectional design of the study limits its ability to establish causality or capture long-term trends in teacher educators' engagement with SDG 4 practices, as it does not track changes in emotional dispositions or levels of engagement over time. Generalizability is constrained by the relatively small sample size ($N = 60$), especially given the diverse contexts of teacher education institutions. Third, the reliance on **self-report questionnaires** raises potential concerns of **social desirability bias**, where participants may present themselves in an overly favorable light (Creswell & Plano Clark, 2018). Moreover, self-reported measures of emotions are sometimes influenced by **momentary mood states** rather than reflecting stable dispositional tendencies, which may reduce the reliability of the responses. Finally, the study did not incorporate **qualitative data**, such as interviews or classroom observations, which could have provided deeper insights into the contextual and experiential aspects of teacher emotions and engagement.

Future Scope:

Future research can address the limitations of this study by employing **larger and more diverse samples across multiple districts and states**, thereby enhancing generalizability. Additionally, **longitudinal studies** would provide valuable insights into how teachers' emotional well-being and engagement with SDG 4 evolve over time.

Beyond quantitative designs, **qualitative approaches** such as in-depth interviews, focus groups, and narrative inquiry could capture the nuanced emotional experiences of educators that standardized scales may overlook.

Such methods would deepen understanding of how emotions shape teachers' daily practices and professional identities.

Furthermore, **comparative studies across national and international contexts** are recommended, particularly to align with global SDG monitoring frameworks. Examining cross-cultural similarities and differences would provide richer evidence on how teacher emotions interact with structural and policy-level enablers in diverse educational systems.

Finally, the integration of **psychological training and emotional intelligence modules** into teacher education and professional development programs represents a promising avenue for applied research. Future studies could assess the effectiveness of such interventions in improving both teacher well-being and educational outcomes linked to SDG 4.

REFERENCES

1. Antoninis, M. (2020). All means all: An introduction to the 2020 Global Education Monitoring Report on inclusion. *Prospects*, 49(3–4), 103–109. <https://doi.org/10.1007/s11125-020-09505-x> PubMed
2. Burić, I., & Frenzel, A. C. (2023). Teacher emotions are linked with teaching quality: Cross-sectional and longitudinal evidence from two field studies. *Learning and Instruction*, 88, 101822. <https://doi.org/10.1016/j.learninstruc.2023.101822> Science Direct Research Gate Springer Link
3. Cristóvão, A. M., Valente, S., Rebelo, H., & Ruivo, A. F. (2023). Emotional education for sustainable development: A curriculum analysis of teacher training in Portugal and Spain. *Frontiers in Education*, 8, 1165319. <https://doi.org/10.3389/feduc.2023.1165319> Frontiers+1
4. Frenzel, A. C., Fiedler, D., Marx, A. K. G., Reck, C., & Pekrun, R. (2020). Who enjoys teaching, and when? Between- and within-person evidence on teachers' appraisal-emotion links. *Frontiers in Psychology*, 11, 1092. <https://doi.org/10.3389/fpsyg.2020.01092> FrontiersPMC
5. UNESCO. (2020). Global Education Monitoring Report 2020: Inclusion and education—All means all. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000373718> EdTech HubUNESCO UNESCO Digital Library
6. UNESCO MGIEP. (2020). Rethinking learning: A review of social and emotional learning frameworks for education systems. UNESCO MGIEP. <https://www.gcedclearinghouse.org/sites/default/files/resources/250021eng.pdf> GCED Clearinghouse
7. Wang, H., Yin, L., & Hall, N. C. (2023). Teacher anger as a double-edged sword: Contrasting trait and daily anger in relation to student engagement. *Social Psychological and Personality Science*, 14(8), 1531–1543. <https://doi.org/10.1177/19485506221147623> PMC
8. Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070. <https://doi.org/10.1037/0022-3514.54.6.1063>