

Transformative Learning, Emotional Intelligence, and Resilience: Testing an Integrative Structural Model among University Students

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Abstract

This study tested an integrative structural model linking transformative learning, emotional intelligence, and psychological resilience among university students. Drawing on Transformative Learning Theory, the ability model of emotional intelligence, and contemporary resilience theory, the study specified transformative learning as the focal exogenous construct within a theoretically ordered model linking reflective learning, self-reported emotional competence, and resilience. A cross-sectional online survey was completed by 742 undergraduate students at a private university in East Africa. Confirmatory Factor Analysis supported the adequacy of the three latent constructs. Structural Equation Modeling demonstrated satisfactory model fit (CFI = .93, TLI = .92, RMSEA = .051, SRMR = .044). Transformative learning was positively associated with emotional intelligence ($\beta = .58, p < .001$) and resilience ($\beta = .42, p < .001$), while emotional intelligence was also positively associated with resilience ($\beta = .34, p < .001$). Bootstrapping analyses indicated a significant indirect association of transformative learning with resilience through emotional intelligence. The model explained 34% of the variance in emotional intelligence and 49% of the variance in resilience. Multi-group invariance analyses supported equivalent measurement and structural relations across gender. Because the design was cross-sectional and based on same-time self-report data, the findings should be interpreted as associations consistent with the proposed model rather than as evidence of causal effects. Even so, the results highlight the relevance of holistic pedagogies for student development in higher education.

Keywords: Transformative learning; Emotional intelligence; Psychological resilience; Structural equation modeling; Higher education; Student development.

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1. Introduction

1.1 Background

Contemporary higher education increasingly recognizes that learning must extend beyond disciplinary knowledge acquisition toward the holistic development of students. Universities are expected not only to cultivate intellectual competence but also to foster emotional maturity, adaptive functioning, and resilient identity formation (Bond et al., 2020; González-Pérez & Ramírez-Montoya, 2022). In rapidly changing academic and socio-digital environments, students must navigate uncertainty, ambiguity, and psychological demands that require integrative developmental capacities rather than purely cognitive skills.

Transformative Learning Theory provides a useful framework for understanding deep educational change. Originally articulated by Mezirow, transformative learning refers to a process through which individuals critically examine previously held assumptions, reconstruct meaning structures, and revise their frames of reference through reflection and dialogue (Taylor, 2000; Hoggan & Higgins, 2023). Contemporary refinements emphasize that transformation is not merely rational or cognitive but also emotional and relational (Carter & Nicolaides, 2023). Perspective transformation often involves disorientation, identity negotiation, and affective engagement, suggesting that transformative learning may be meaningfully related to students' emotional capacities alongside cognitive restructuring.

Within this expanded framework, transformative learning can be theorized as an educational process associated with psychological resources important for adaptive functioning. One such resource is emotional intelligence (EI), defined in the ability tradition as the capacity to perceive, understand, regulate, and use emotions effectively (Mayer et al., 2016; Krishnan & Awang, 2025). In higher education research, emotionally informed reflection, dialogue, and perspective taking are frequently discussed as conditions that may coincide with stronger self-regulation, empathy, and adaptive decision-making (Colomer et al., 2020; Carter &

Nicolaides, 2023).

In parallel, psychological resilience has emerged as a key construct in higher education research. Resilience refers to the capacity to adapt positively to stress, recover from adversity, and sustain functioning amid challenge (Connor & Davidson, 2003; Borazon & Chuang, 2023). Evidence increasingly suggests that emotional regulation and cognitive flexibility are important correlates of resilience (Trigueros et al., 2020; Borazon & Chuang, 2023). Because transformative learning emphasizes critical self-examination, tolerance for ambiguity, and meaning reconstruction, it may be associated with resilience directly and also indirectly through emotional intelligence.

Despite growing theoretical overlap among transformative learning, emotional intelligence, and resilience, empirical studies rarely integrate these constructs within a single structural model. There remains a need to examine whether the associations among these variables are consistent with a theoretically ordered model in which transformative learning is linked with emotional intelligence and, in turn, with resilience among university students.

1.2 Problem Statement

Although transformative learning scholarship increasingly acknowledges affective and relational dimensions (Carter & Nicolaides, 2023; Hoggan & Higgins, 2023), empirical research has often treated emotional competencies as peripheral rather than integral correlates of transformative processes. At the same time, emotional intelligence research in higher education typically examines EI as a predictor of well-being or academic success without situating it within broader pedagogical contexts that may be associated with emotional development (Azpiazu et al., 2023).

Similarly, resilience research frequently identifies emotional regulation as a protective factor but does not systematically examine how educational experiences and reflective learning environments

relate to the development of such resources (Borazon & Chuang, 2023; Trigueros et al., 2020). As a result, the pattern of associations linking transformative learning, emotional competence, and resilience remains underexplored. Recent methodological discussions in covariance-based SEM also emphasize the need for theoretically integrated models with careful measurement justification and transparent reporting (Gaskin et al., 2025).

In university environments characterized by academic pressure, identity transitions, and digital saturation, fragmented interventions targeting either cognition or emotion may fail to generate durable change (Bond et al., 2020; González-Pérez & Ramírez-Montoya, 2022). There is therefore a need for integrative models that examine whether transformative learning is meaningfully associated with emotional intelligence and resilience within the same explanatory framework.

Testing such a model is particularly relevant in institutional contexts that emphasize holistic student formation. Clarifying these interrelationships can inform curriculum design, student support initiatives, and future longitudinal research, while generalization from the present study should remain limited to contexts comparable to the participating institution.

1.3 Research Objectives

The primary objective of this study is to examine an integrative structural model in which transformative learning is specified as the focal exogenous construct associated with emotional intelligence and psychological resilience among university students. Specifically, the study examines whether transformative learning is positively associated with emotional intelligence, whether it is also associated with psychological resilience, and whether emotional intelligence is independently associated with resilience. Furthermore, the study tests whether emotional intelligence statistically mediates the association between transformative learning and resilience. Using structural equation modeling, the research aims to evaluate whether the observed data

are consistent with a theoretically ordered pathway linking transformative learning, emotional competence, and adaptive functioning in higher education contexts.

1.4 Research Questions

This study is guided by the following research questions:

1. Is transformative learning positively associated with emotional intelligence among university students?
2. Is transformative learning positively associated with psychological resilience?
3. Is emotional intelligence positively associated with resilience?
4. Does emotional intelligence statistically mediate the association between transformative learning and resilience?

1.5 Expected Contributions

This study contributes to the literature in three more circumscribed ways. Theoretically, it brings transformative learning, emotional intelligence, and resilience into the same model while treating the proposed ordering as a theory-guided structure rather than as an empirically established developmental sequence. Empirically, it examines direct and indirect paths among the three constructs within one SEM framework and tests whether the pattern is invariant across gender. Practically, it offers evidence that reflective and dialogical educational experiences are meaningfully associated with students' reported emotional competence and resilience, while also clarifying the design and measurement limitations that must be addressed before stronger causal claims can be made.

2. Theoretical Framework

2.1 Transformative Learning Theory

Transformative Learning Theory, originally developed by Jack Mezirow, posits that adult learning can involve critical reflection on previously held assumptions, leading to perspective transformation and the development of more inclusive,

discriminating, and integrative meaning structures (Taylor, 2000; Hoggan & Higgins, 2023). Transformative learning is often described as being triggered by a disorienting dilemma that prompts individuals to question habitual frames of reference and reconstruct their understanding of self and world. Contemporary scholarship has expanded this framework by emphasizing that transformation is not solely a rational-cognitive process but also an affective, relational, and contextual one (Carter & Nicolaides, 2023; Hoggan & Kloubert, 2020). Emotional engagement, identity negotiation, and dialogical interaction are therefore treated as central components of transformative learning, particularly in higher education settings where students navigate complex developmental transitions.

In university contexts, transformative learning may be observed when students reinterpret lived experiences, revise belief systems, and develop greater self-authorship and social responsibility (Kokkos, 2024). Within this study, transformative learning is conceptualized as a multidimensional process encompassing critical reflection, openness to alternative perspectives, dialogical engagement, and perspective change. It serves as the focal exogenous construct in the proposed model through which educational experiences are theorized to relate to emotional intelligence and resilience.

2.2 Emotional Intelligence Theory

Emotional Intelligence (EI), as conceptualized in the ability model associated with Peter Salovey and John D. Mayer, refers to the capacity to perceive, understand, regulate, and use emotions effectively (Mayer et al., 2016; Krishnan & Awang, 2025). Importantly, the ability model is classically operationalized through performance-based tasks rather than self-descriptive questionnaires. In applied higher-education research, however, self-report instruments are often used as proxies for perceived emotional competence, even though they do not assess maximal emotional performance in the same way.

Within the present theoretical ordering, EI is positioned as an intermediate construct that may help explain why students reporting greater engagement in transformative learning also report greater resilience. Students who are more emotionally aware and better able to regulate emotion may be better able to engage in reflection, tolerate ambiguity, and translate meaning reconstruction into adaptive coping. The study therefore treats EI as a theoretically important mediator consistent with, but not definitive proof of, the proposed ordering from transformative learning to resilience.

2.3 Resilience Theory

Resilience Theory conceptualizes resilience as a dynamic process of positive adaptation despite adversity, stress, or significant life challenges (Connor & Davidson, 2003; Borazon & Chuang, 2023). Rather than a fixed trait, resilience is typically understood as a multidimensional capacity shaped by internal psychological resources and contextual support. Contemporary resilience scholarship highlights emotional regulation, cognitive flexibility, and meaning making as central protective processes (Borazon & Chuang, 2023; Trigueros et al., 2020). Within university environments, resilience reflects students' ability to sustain academic engagement, recover from setbacks, and adapt constructively to social and institutional demands. In the present framework, resilience is treated as an outcome construct that is theoretically linked to both transformative learning and emotional intelligence.

2.4 Integrative Structural Model

Drawing upon Transformative Learning Theory, Emotional Intelligence Theory, and Resilience Theory, this study proposes an integrative structural model of holistic student development. The model specifies transformative learning as the focal exogenous construct, emotional intelligence as an intermediate construct, and resilience as the outcome construct. Theoretical expectations are that transformative learning will be positively associated with emotional intelligence, that transformative learning will also be positively associated with

resilience, and that emotional intelligence will be positively associated with resilience. In addition, emotional intelligence is expected to statistically mediate the association between transformative learning and resilience.

Within this integrative framework (Figure 1), transformative learning represents reflective and dialogical engagement with experience, emotional intelligence represents perceived emotional

competence, and resilience represents adaptive functioning amid academic and life challenges. Empirically testing this configuration allows the study to examine whether a theoretically coherent cognitive-affective pattern is observable within one higher-education sample, while recognizing that the cross-sectional design cannot establish temporal sequencing

Figure 1: Integrative Structural Model of Holistic Student Development

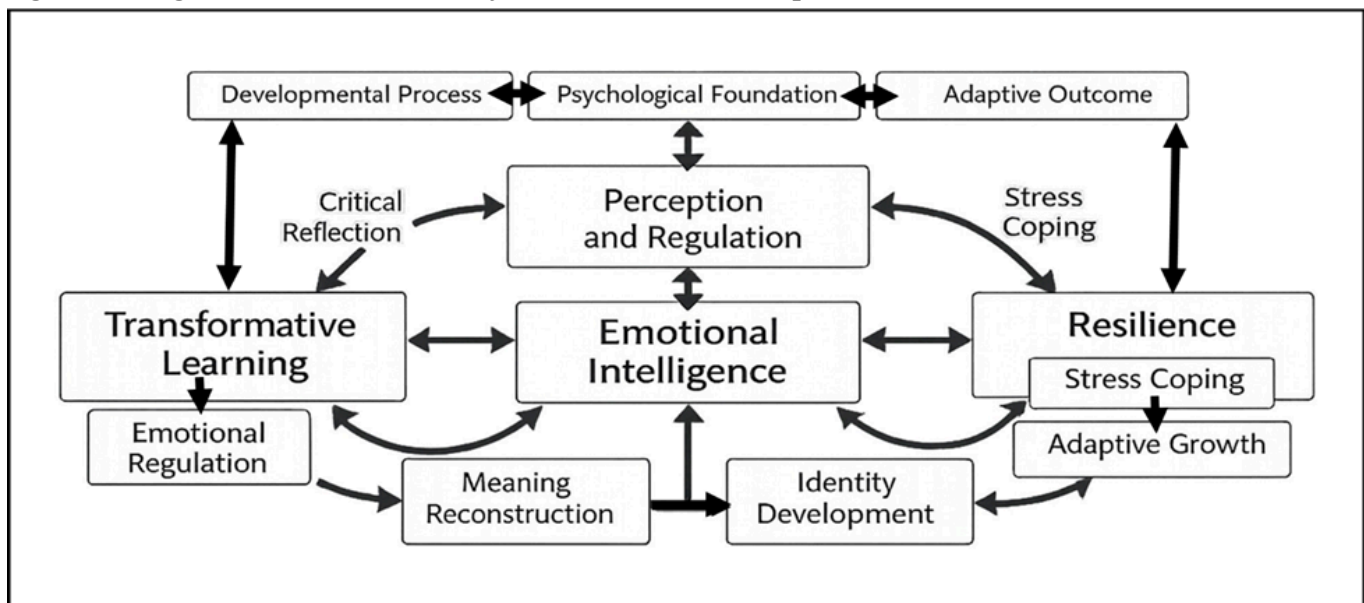


Figure 1 Shows the theorized ordering in which transformative learning is linked to resilience directly and indirectly through emotional intelligence.

3. Methods and Materials

3.1 Study Design

This study employed a cross-sectional, theory-driven quantitative design using an online questionnaire to examine the associations among transformative learning, emotional intelligence, and psychological resilience among university students. Structural Equation Modeling (SEM) was selected because it enables the simultaneous estimation of latent constructs, accounts for measurement error, and allows theoretically ordered direct and indirect paths to be tested within a unified framework. The analytic strategy followed a two-step procedure: first, Confirmatory Factor Analysis (CFA) was conducted

to evaluate the measurement model; second, the structural model was estimated to examine the proposed paths, including the indirect association through emotional intelligence using bootstrapping with bias-corrected confidence intervals. To examine whether the measurement model and the structural paths operated similarly across gender, multi-group invariance analysis was conducted sequentially at the configural, metric, scalar, and structural levels. Given the cross-sectional and same-source nature of the data, the tested ordering is interpreted as theory-consistent association rather than demonstrated causal sequence.

3.2 Participants

The analytic sample comprised 742 undergraduate students enrolled at a private university in East Africa. Participants represented business, social sciences, and technology-related programs, ranging in age from 18 to 27 years, and included 52% female and 48% male students. Eligibility required full-time undergraduate enrollment and age 18 years or older.

Recruitment proceeded through institutional communication channels that distributed the survey link to eligible students. Participation was voluntary and anonymous, and no formal sampling quotas were imposed. Because the available circulation logs did not permit a verified denominator of students who received and opened the invitation, an exact response rate could not be calculated. The final sample nevertheless exceeded conventional recommendations for covariance-based SEM and multi-group invariance testing, supporting stable parameter estimation (Kline, 2023).

3.3 Measures

3.3.1 Transformative Learning Scale for the Innovation Mindset (TLSIM-12)

Transformative learning was measured using a study-specific 12-item short form derived from the Transformative Learning Scale for the Innovation Mindset (TLSIM) developed and validated by Kulturel-Konak et al. (2025). The full TLSIM provided the conceptual item pool; for the present SEM model, 12 items were selected to preserve representation of four core dimensions—critical reflection, openness to alternative perspectives, dialogical engagement, and perspective transformation—while limiting parameter proliferation. The resulting TLSIM-12 should therefore be understood as an analytically reduced form assembled for this study rather than as a separate previously established standalone instrument. Participants rated the items on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating stronger reported engagement in transformative learning processes. In the present study, the short form exhibited high internal consistency (Cronbach's $\alpha = .88$), supporting its adequacy for the current SEM

analyses.

3.3.2 Connor–Davidson Resilience Scale (CD-RISC-10)

Psychological resilience was assessed using the 10-item short form of the Connor–Davidson Resilience Scale (CD-RISC-10), developed by (Campbell-Sills & Stein, 2007) as a refined unidimensional version of the original 25-item instrument (Connor & Davidson, 2003). The CD-RISC-10 evaluates core aspects of resilience, including adaptability to change, persistence in the face of adversity, emotional regulation, confidence under pressure, and the capacity to recover from stress. Items are rated on a 5-point Likert scale ranging from 0 (not true at all) to 4 (true nearly all of the time), with higher total scores indicating greater resilience. The short form has demonstrated strong psychometric properties across diverse populations, including high internal consistency ($\alpha \approx .85-.90$) and good construct validity. In the present study, the CD-RISC-10 exhibited strong reliability (Cronbach's $\alpha = .86$), supporting its suitability for structural equation modeling within a university student sample.

3.3.3 Emotional Intelligence Scale (EI-12)

Emotional intelligence was measured using a 12-item self-report instrument constructed to reflect the four-branch ability model described by Mayer et al. (2016), with three items representing emotional perception, emotional understanding, emotional regulation, and emotional utilization. Because the ability model is normally assessed with performance-based measures, the present instrument is better interpreted as a self-report proxy for perceived emotional competence than as a direct ability test. The 12 items were selected to retain coverage of the four theorized branches while keeping the SEM model parsimonious. Participants rated each item on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), with higher scores indicating greater perceived emotional competence. This operational choice aligned the measure with the theoretical model while narrowing interpretation:

associations involving EI in this study concern self-perceived emotional competence, not objectively demonstrated emotional ability. In the present study, the EI short form demonstrated strong internal consistency (Cronbach's $\alpha = .87$), supporting its adequacy for SEM analyses.

3.4 Ethics and Transparency

The study involved anonymous online survey responses from adults aged 18 years and older. Before accessing the questionnaire, participants viewed an electronic informed-consent statement describing the purpose of the study, the voluntary nature of participation, the right to discontinue at any point, and the anonymous handling of responses. Continuing to the survey indicated consent.

No directly identifying information was collected, and responses were analyzed only in aggregate form to protect confidentiality. The study was conducted in accordance with institutional requirements for low-risk research involving human participants. [Please insert the approving ethics body and approval or exemption reference number here, if applicable.]

To strengthen transparency, the dataset should be treated as de-identified but non-public because it concerns student survey responses. A formal data availability statement is provided at the end of the manuscript.

3.5 Data Analysis

Data analysis was conducted in four sequential phases. First, preliminary analyses were performed using SPSS to compute descriptive statistics, examine demographic characteristics, assess distributional properties (skewness and kurtosis), estimate internal consistency via Cronbach's alpha, and inspect bivariate associations using Pearson correlations. Second, Confirmatory Factor Analysis (CFA) was conducted in AMOS to evaluate the adequacy of the measurement model. Model fit was assessed using

the Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI), with values around or above .90 indicating acceptable fit, and the Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR), with values of .08 or below indicating acceptable residual error. Convergent and discriminant validity were examined through standardized factor loadings ($\geq .50$), Average Variance Extracted ($AVE \geq .50$), Composite Reliability ($CR \geq .70$), and the Fornell-Larcker criterion. Third, Structural Equation Modeling (SEM) was used to estimate the theorized paths among the constructs, with indirect associations evaluated through bootstrapping procedures (5,000 resamples; 95% bias-corrected confidence intervals). Finally, multi-group invariance analysis across gender evaluated configural, metric, scalar, and structural invariance using $\Delta CFI \leq .01$ and $\Delta RMSEA \leq .015$ as criteria for invariance.

4. Results

4.1 Demographic characteristics

The final sample consisted of 742 undergraduate students aged between 18 and 27 years ($M = 21.4$, $SD = 2.8$), with 52% identifying as female and 48% as male (see Table 1). Participants were distributed across all academic years, with the largest proportion enrolled in Year 2 (28.3%), followed by Year 3 (25.6%), Year 1 (24.3%), and Year 4 (21.8%). Students represented diverse academic disciplines, including Business (35.0%), Social Sciences (28.3%), Technology-related programs (25.6%), and other fields (11.1%). The sample included both East African students (60.0%) and international students (40.0%), reflecting the diversity of the participating private-university context.

Table 1. Demographic Characteristics of Participants (N = 742)

Variable	Category	n	%
Gender	Male	356	48.0
	Female	386	52.0
Age	Range	18–27	—
	Mean (SD)	21.4 (2.8)	—
Year of Study	Year 1	180	24.3
	Year 2	210	28.3
	Year 3	190	25.6
	Year 4	162	21.8
Academic Discipline	Business	260	35.0
	Social Sciences	210	28.3
	Technology	190	25.6
	Other Programs	82	11.1
Student Status	East African	445	60.0
	International	297	40.0

Table 1 Summarizes the sample by gender, age, year of study, academic discipline, and student status.

4.2 Preliminary Analyses

Descriptive statistics, internal consistency estimates, and Pearson correlation coefficients for the study variables are reported in Table 2. All three scales demonstrated strong reliability, with Cronbach's alpha coefficients ranging from .86 to .88, indicating satisfactory internal consistency. Examination of skewness and kurtosis values revealed that all variables fell within acceptable limits (± 2), suggesting that the assumption of normality was not

violated. Bivariate correlations showed that emotional intelligence was positively and significantly associated with transformative learning ($r = .58, p < .001$) and resilience ($r = .56, p < .001$). Transformative learning was also positively correlated with resilience ($r = .65, p < .001$). These preliminary findings provide initial empirical support for the proposed structural relationships among the constructs.

Table 2. Descriptive Statistics, Reliability, and Correlations Among Study Variables (N = 742)

Variable	M	SD	1. Transformative Learning	2. Emotional Intelligence	3. Resilience
1. Transformative Learning	3.84	0.62	-		
2. Emotional Intelligence	3.76	0.58	.58***	-	
3. Resilience	3.68	0.64	.65***	.56***	-

Table 2 Reports descriptive statistics, scale reliability, and bivariate correlations for the study variables. *** $p < .0015$.

4.3 Measurement Model

Confirmatory Factor Analysis (CFA) was conducted

to assess the adequacy of the three-factor measurement model comprising Transformative Learning, Emotional Intelligence, and Resilience. The overall model demonstrated acceptable-to-good fit to the data (CFI = .94, TLI = .93, RMSEA = .048, 90% CI [.042, .054], SRMR = .041), indicating that the hypothesized latent structure captured the observed covariance matrix reasonably well. Although the CFI fell just below the more stringent .95 benchmark, the pattern of indices remained within commonly accepted SEM criteria for an adequately fitting model (Kline, 2023).

As illustrated in **Figure 2**, the Transformative Learning short-form items (TL01–TL12) loaded significantly onto their latent construct, with standardized factor loadings ranging from .68 to .85. Emotional Intelligence items (EI01–EI12) also

showed strong and statistically significant loadings ($p < .001$), ranging from .68 to .84. Similarly, Resilience items (RES01–RES10) demonstrated significant loadings between .68 and .85. All standardized loadings exceeded the recommended .50 threshold, supporting strong indicator reliability.

Composite Reliability (CR) values ranged from .88 to .92 across the three constructs, and Average Variance Extracted (AVE) values ranged from .54 to .63, confirming adequate convergent validity. Discriminant validity was further supported, as the square root of AVE for each construct exceeded the inter-construct correlations, indicating that Transformative Learning, Emotional Intelligence, and Resilience were empirically distinct yet theoretically related latent variables.

Figure 2. Confirmatory Factor Analysis (CFA) of the Three-Factor Measurement Model

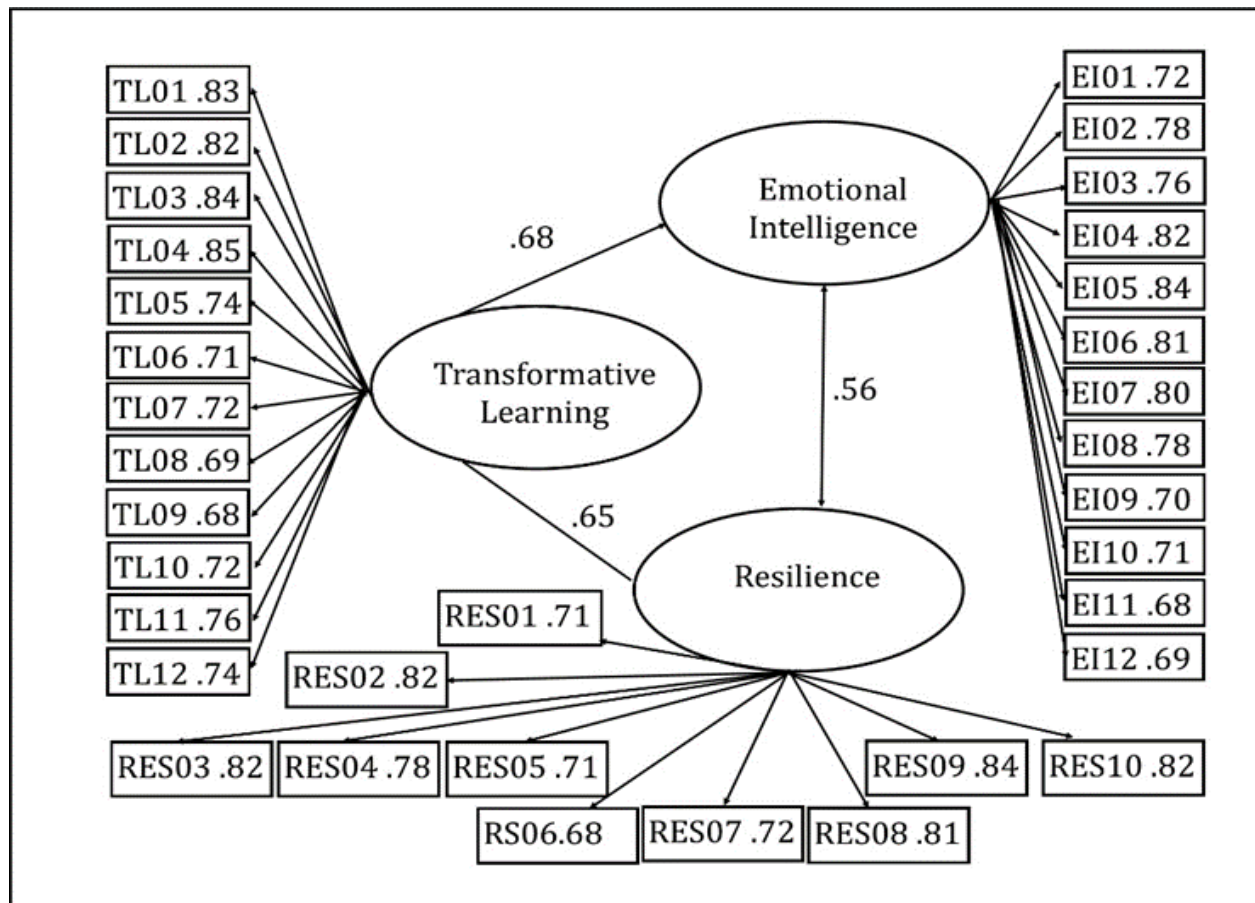


Figure 2 Displays the measurement model with standardized factor loadings and correlations among the latent constructs.

4.4 Structural Model

The structural model was estimated to examine whether the observed covariances among transformative learning, emotional intelligence, and resilience were consistent with the proposed theoretical ordering (see Table 3 and Figure 3). The model demonstrated satisfactory overall fit according to established SEM benchmarks (CFI = .93, TLI = .92, RMSEA = .051, SRMR = .044). Within this model, transformative learning was positively associated with emotional intelligence ($\beta = .58$, $p < .001$) and resilience ($\beta = .42$, $p < .001$), and emotional intelligence was positively associated with resilience

($\beta = .34$, $p < .001$). Bootstrapping procedures with 5,000 resamples indicated a significant indirect association of transformative learning with resilience through emotional intelligence ($\beta = .20$, 95% CI [.14, .27]), consistent with partial mediation. The structural model accounted for 34% of the variance in emotional intelligence and 49% of the variance in resilience. Because the data were cross-sectional, these path coefficients should be interpreted as model-consistent directional associations rather than evidence of temporal or causal effects.

Table 3. Structural Path Coefficients

Hypothesized Path	Standardized β	SE	CR	p	95% CI
Transformative Learning $\rightarrow$ Emotional Intelligence	.58	.05	11.60	<.001	[.49, .67]
Transformative Learning $\rightarrow$ Resilience	.42	.05	8.40	<.001	[.32, .52]
Emotional Intelligence $\rightarrow$ Resilience	.34	.06	5.67	<.001	[.22, .46]
Transformative Learning $\rightarrow$ Emotional Intelligence $\rightarrow$ Resilience (Indirect Effect)	.20	.04	—	<.001	[.14, .27]

Notes: β = standardized path coefficient; SE = standard error; CR = critical ratio; CI = bias-corrected bootstrap confidence interval (5,000 resamples). Indirect effects are significant when the 95% CI does not include zero.

Figure 3: Structural Model with Standardized Path Coefficients

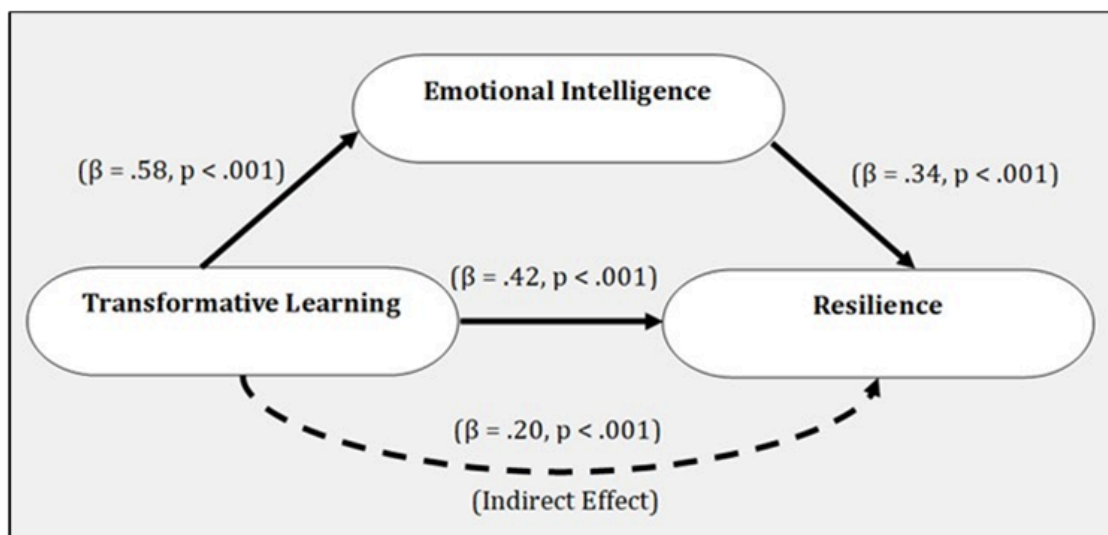


Figure 3 Illustrates the significant direct paths and the indirect pathway from transformative learning to resilience through emotional intelligence.

4.5 Multi-Group Invariance Analysis

Multi-group analyses in Table 4 were conducted to examine whether the measurement and structural models were invariant across gender (male vs. female students). A sequential testing procedure was followed, including configural, metric, scalar, and structural invariance. The configural model demonstrated good fit, indicating that the overall factor structure was consistent across groups. Subsequent constraints on factor loadings (metric invariance) and item intercepts (scalar invariance)

resulted in negligible changes in fit indices ($\Delta CFI \leq .01$; $\Delta RMSEA \leq .015$), supporting measurement equivalence. Finally, structural invariance testing showed that constraining the path coefficients across gender did not significantly deteriorate model fit, suggesting that the relationships among transformative learning, emotional intelligence, and resilience operate similarly for male and female students. These findings support the robustness of the proposed structural model across gender groups within the present sample.

Table 4. Multi-Group Invariance Analysis Across Gender

Model	χ^2	df	CFI	TLI	RMSEA	ΔCFI	$\Delta RMSEA$	Decision
Configural Invariance	1854.32	742	.93	.92	.052	—	—	Supported
Metric Invariance (Loadings constrained)	1876.45	758	.93	.92	.053	.001	.001	Supported
Scalar Invariance (Intercepts constrained)	1902.18	774	.92	.92	.054	.008	.001	Supported
Structural Invariance (Paths constrained)	1914.76	778	.92	.91	.055	.009	.001	Supported

CFI = Comparative Fit Index; TLI = Tucker–Lewis Index; RMSEA = Root Mean Square Error of Approximation. Invariance is supported when $\Delta CFI \leq .01$ and $\Delta RMSEA \leq .015$

5. Discussion

The present study examined whether associations among transformative learning, emotional intelligence, and resilience were consistent with an integrative structural model among university students. The model fit the data satisfactorily, and all hypothesized paths were statistically significant. Higher reported transformative learning was associated with higher self-reported emotional intelligence and higher resilience, while emotional intelligence was also positively associated with resilience. Because the evidence is cross-sectional and based on same-time self-reports, these findings

are best interpreted as associations consistent with the proposed model rather than as verified developmental effects. Even so, they extend current discussions of higher education as a site of not only cognitive but also affective and adaptive student development (Hoggan & Higgins, 2023; Hoggan & Kloubert, 2020; Taylor, 2000).

First, the positive association between transformative learning and emotional intelligence is consistent with theoretical arguments that perspective transformation involves affective as well as cognitive work (Carter & Nicolaides, 2023; Hoggan & Higgins, 2023). Critical reflection, dialogical engagement, and

identity negotiation may be accompanied by greater emotional awareness and regulation, which helps explain why students reporting richer transformative learning experiences also reported higher emotional competence. At the same time, because emotional intelligence was measured through self-report rather than performance testing, the present results should be understood as associations with perceived emotional competence rather than with objectively demonstrated emotional ability.

Second, the positive association between transformative learning and resilience is consistent with resilience scholarship emphasizing meaning-making, cognitive flexibility, and adaptive interpretation of difficulty (Borazon & Chuang, 2023; Connor & Davidson, 2003). Students who reinterpret challenging experiences through reflection and dialogue may be better positioned to describe themselves as able to adapt to setbacks. However, the design does not allow the present study to determine whether transformative learning precedes resilience over time or whether more resilient students are also more likely to report transformative learning experiences.

Third, the positive association between emotional intelligence and resilience accords with prior work linking emotion regulation, adaptive emotional processing, and coping capacity among university students (Trigueros et al., 2020; Azpiazu et al., 2023). The indirect path observed in the model suggests that emotional intelligence may be one plausible explanatory mechanism through which transformative learning is linked to resilience. Nevertheless, the partial nature of the mediation also indicates that other mechanisms, such as meaning-making, social support, or self-authorship, may help explain the relationship and merit examination in future research.

The multi-group invariance analysis further suggested that the measurement model and the structural paths operated similarly across male and female students in this sample. Configural, metric,

scalar, and structural invariance were all supported, indicating that the proposed model was stable across gender at both measurement and path levels. This finding strengthens confidence in the internal consistency of the model across the two groups studied, while still leaving open the need for further testing across other demographic, institutional, and cultural contexts.

Practically, the findings are consistent with the view that reflective dialogue, mentoring, and other meaning-oriented pedagogies may support students' emotional and adaptive development. Even so, curricular or intervention claims should remain cautious: the present study cannot establish that such pedagogies cause gains in emotional intelligence or resilience. Longitudinal and experimental designs are needed before stronger policy or program recommendations are made.

6. Limitations and Future Directions

Several limitations should temper interpretation. First, the cross-sectional design and same-time self-report measures do not permit causal inference or empirical confirmation of temporal ordering. Second, the study relied on a single private-university setting in East Africa, and the absence of a verifiable invitation denominator means that a precise response rate could not be reported; generalization should therefore be limited to comparable contexts rather than the region as a whole. Third, the emotional-intelligence measure was a self-report proxy aligned with the ability model rather than a performance-based assessment, which narrows the meaning of the construct. Fourth, same-source measurement may have inflated some associations. Future research would benefit from longitudinal, multi-institutional, and multi-method designs, including performance-based EI measures and broader contextual moderators, to test the robustness of the proposed model.

7. Conclusion

This study provides empirical evidence that reported transformative learning, emotional intelligence, and

resilience are positively linked in ways consistent with an integrative structural model among university students. Within the tested model, transformative learning occupied the central exogenous position and was associated with both emotional intelligence and resilience, while emotional intelligence was also associated with resilience. These findings support the value of examining reflective pedagogy, emotional competence, and adaptive functioning together rather than as isolated domains.

At the same time, the study does not establish that transformative learning causes growth in emotional intelligence or resilience. Its contribution lies instead in clarifying a theoretically coherent pattern of associations within a higher-education setting and in identifying measurement, sampling, and design issues that future work should address more rigorously. By framing student development as cognitive, emotional, and adaptive at once, the study offers a more careful basis for subsequent longitudinal and intervention research on holistic higher education.

8. Data Availability Statement

The de-identified dataset supporting the conclusions of this article is not publicly archived because it contains student survey responses. It may be made available by the corresponding author on reasonable request, subject to institutional and ethical safeguards.

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