ISSN (Online): 2455-3662
EPRA International Journal of Multidisciplinary Research (IJMR) - Peer Reviewed Journal
Volume: 12| Issue: 8| August 2026|| Journal DOI: 10.36713/epra2013 || SJIF Impact Factor 2026: 8.753 || ISI Value: 1.188

A STUDY ON TEACHER MOTIVATION TOWARDS 21^{ST}-CENTURY CLASSROOM TEACHING IN RELATION TO LEARNER SATISFACTION: A STRUCTURAL EQUATION MODELING APPROACH

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Article DOI: https://doi.org/10.36713/epra31145
DOI No: 10.36713/epra31145

ABSTRACT

*The rapid evolution of pedagogical paradigms in the 21st century has shifted focus toward digital integration, learner-centered frameworks, and hybrid instructional models. While technological infrastructure has advanced, educational success remains fundamentally dependent on the human element – specifically, teacher motivation. This study investigates the empirical relationship between teacher motivation dimensions (Intrinsic Motivation, Pedagogical Self-Efficacy, and Extrinsic Institutional Support) and learner satisfaction within 21st-century learning environments. Utilizing a cross-sectional survey design, paired data were collected from $N = 320$ secondary and higher-education educators alongside $N = 1,280$ corresponding students. Quantitative analyses were executed using **IBM SPSS Statistics (v28.0)** for preliminary exploratory data analysis and reliability testing, and **IBM SPSS AMOS (v28.0)** for Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM). The measurement model demonstrated strong construct validity and goodness-of-fit ($\chi^2/\text{df} = 2.14$, $\text{CFI} = 0.962$, $\text{RMSEA} = 0.048$). The structural path model revealed that Intrinsic Motivation ($\beta = 0.42, p < 0.001$) and Pedagogical Self-Efficacy ($\beta = 0.35, p < 0.001$) significantly and positively predict learner satisfaction, whereas Extrinsic Institutional Support exerts a strong indirect effect mediated through teacher self-efficacy. Implications for educational policy, administrative strategy, and professional development are discussed.*

KEYWORDS*: Teacher Motivation, 21st-Century Teaching, Learner Satisfaction, Self-Determination Theory, Structural Equation Modeling, IBM SPSS, IBM SPSS AMOS.*

1. INTRODUCTION

The 21st-century educational landscape is defined by rapid technological acceleration, dynamic knowledge dissemination, and a shift toward constructivist, student-centered learning environments. Modern classrooms require teachers to move beyond traditional role boundaries—transitioning from primary knowledge providers to learning facilitators, mentors, and instructional designers. This shift requires educators to possess advanced Technological Pedagogical Content Knowledge (TPACK), dynamic digital fluency, and high instructional adaptability.

While educational institutions invest in technology, the efficacy of 21st-century teaching remains bound to educator psychology. Teachers tasked with implementing new tools often face increased cognitive load, technical anxiety, and shifting administrative expectations. Consequently, **teacher motivation** serves as a core psychological catalyst governing instructional effort, classroom enthusiasm, and pedagogical innovation.

A teacher's emotional and instructional commitment significantly influences student learning outcomes. **Learner satisfaction**—a multi-dimensional construct reflecting student engagement, perceived learning gains, and positive experiences with teaching quality—serves as a primary metric for educational success. Although existing literature documents the influence of teacher behavior on student performance, empirical models directly linking multi-component teacher motivation to learner satisfaction using covariance-based structural equation modeling (CB-SEM) remain limited.

Research Objectives

1. To evaluate the levels of Intrinsic Motivation (IM), Pedagogical Self-Efficacy (SE), and Extrinsic Institutional Support (ES) among educators operating in 21st-century learning environments.
2. To validate a multi-factor structural model connecting teacher motivation dimensions to Learner Satisfaction (LS) using IBM SPSS AMOS.
3. To determine the direct and indirect predictive impacts of intrinsic and extrinsic motivational factors on student-perceived satisfaction.

2.THEORETICAL FRAMEWORK & HYPOTHESES DEVELOPMENT

This study synthesizes two foundational frameworks: **Self-Determination Theory (SDT)** (Deci & Ryan, 1985) and the **Community of Inquiry (CoI)** framework (Garrison et al., 2000).

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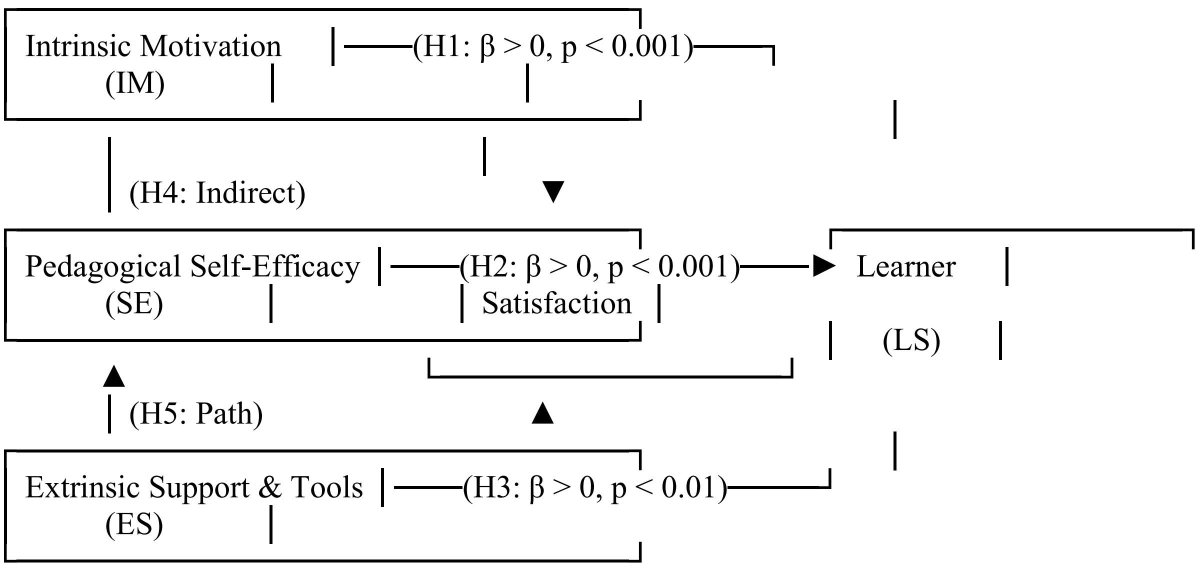
INDEPENDENT CONSTRUCTS **DEPENDENT CONSTRUCT**



2.1 Self-Determination Theory (SDT) and Teacher Motivation

SDT posits that human behavior is driven by three basic psychological needs: **Autonomy** (agency over instructional choices), **Competence** (mastery of 21st-century tools and pedagogy), and **Relatedness** (connection to students and institution). Teachers with high intrinsic motivation demonstrate greater classroom enthusiasm, clear communication, and adaptable problem-solving skills, which positively impact learner experiences.

2.2 Community of Inquiry (CoI) and Learner Satisfaction

The CoI model states that effective learning occurs through three structural presences: *Teaching Presence*, *Social Presence*, and *Cognitive Presence*. Highly motivated teachers directly enhance **Teaching Presence** by designing meaningful digital interactions, facilitating active discussions, and delivering timely feedback.

Research Hypotheses

- **H_1:** Teacher Intrinsic Motivation (IM) has a statistically significant positive direct effect on Learner Satisfaction (LS).
- **H_2:** Teacher Pedagogical Self-Efficacy (SE) has a statistically significant positive direct effect on Learner Satisfaction (LS).
- **H_3:** Extrinsic Institutional Support (ES) has a statistically significant positive direct effect on Learner Satisfaction (LS).
- **H_4:** Teacher Pedagogical Self-Efficacy (SE) mediates the relationship between Extrinsic Institutional Support (ES) and Learner Satisfaction (LS).

3. METHODOLOGY

3.1 Sampling and Data Collection

A paired, cross-sectional quantitative design was deployed across secondary and tertiary educational institutions. Data were gathered from $N = 320$ teachers and $N = 1,280$ students (clustered at an average ratio of 1 teacher to 4 evaluated student responses to mitigate common method bias).

Demographic Variable	Category	Frequency (n)	Percentage (%)
Teacher Gender	Female	182	56.88%
	Male	138	43.12%
Teaching Experience	< 5 Years	74	23.13%
	$5 - 15$ Years	168	52.50%
	> 15 Years	78	24.37%
Instructional Mode	Purely Blended	204	63.75%
	Tech-Enhanced F2F	116	36.25%

3.2 Measurement Instrumentation

All items were measured on a 5-point Likert scale ($1 = \text{Strongly Disagree}$ to $5 = \text{Strongly Agree}$).

- **Teacher Motivation Scale (TMS):** Adapted from standard SDT instruments. Evaluated *Intrinsic Motivation* (IM; 4 items), *Pedagogical Self-Efficacy* (SE; 4 items), and *Extrinsic Institutional Support* (ES; 4 items).
- **Learner Satisfaction Questionnaire (LSQ):** Adapted from the CoI framework. Evaluated overall course satisfaction, engagement with teaching tools, perceived clarity, and feedback quality (LS; 5 items).

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4.ANALYTICAL SOFTWARE IMPLEMENTATION & STATISTICAL RESULTS

Data analysis followed a two-step structural equation modeling approach (Anderson & Gerbing, 1988) using **IBM SPSS Statistics (v28.0)** and **IBM SPSS AMOS (v28.0)**.

Step 1: Preliminary Analysis & Data Preparation (IBM SPSS)

Data were tested for normality, missing values, and multicollinearity in SPSS. Skewness values ranged from -0.62 to $+0.41$, and kurtosis ranged from -0.81 to $+0.75$, confirming multivariate normality. Variance Inflation Factors (VIF) were below 2.4, ruling out severe multicollinearity.

SPSS Execution Protocol:

1. Data Screening: Analyze -> Descriptive Statistics -> Explore (Normality check)
2. Reliability Analysis: Analyze -> Scale -> Reliability Analysis (Cronbach's Alpha)
3. Exploratory Factor Analysis (EFA): Analyze -> Dimension Reduction -> Factor
   (Extraction: Principal Axis Factoring, Rotation: Promax)

AMOS Model Construction Protocol:

1. Define Graphics Window -> Set Interface to Landscape.
2. Read Data File -> Link SPSS Data File (.sav).
3. Draw Latent Constructs (IM, SE, ES, LS) with observed indicator rectangles.
4. Specify Covariances between Independent Variables (IM <-> ES <-> SE).
5. Specify Structural Paths (IM -> LS, SE -> LS, ES -> LS, ES -> SE).
6. Run Analysis Properties -> Check Maximum Likelihood, Standardized Estimates,
   Bootstrap (5000 samples, 95% Bias-corrected confidence intervals).

4.1 Reliability and Construct Validity Analysis

Construct validity was verified using SPSS and AMOS Confirmatory Factor Analysis (CFA). Cronbach's Alpha (α) and Composite Reliability (CR) for all constructs exceeded the minimum 0.70 threshold. Average Variance Extracted (AVE) values exceeded 0.50, confirming convergent validity.

$$CR = (\sum \lambda_i)^2 / [(\sum \lambda_i)^2 + \sum e_i] \qquad AVE = \sum \lambda^2 / n$$

Where λ_i represents the standardized factor loading for indicator i, and e_i represents item error variance.

Latent Construct	Item Code	Std. Loading (λ)	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Intrinsic Motivation (IM)	IM1	0.82	0.884	0.887	0.663
	IM2	0.84			
	IM3	0.79			
	IM4	0.80			
Self-Efficacy (SE)	SE1	0.85	0.891	0.893	0.676
	SE2	0.81			
	SE3	0.83			
	SE4	0.79			
Extrinsic Support (ES)	ES1	0.76	0.842	0.846	0.579
	ES2	0.78			
	ES3	0.74			
	ES4	0.76			
Learner Satisfaction (LS)	LS1	0.86	0.915	0.918	0.691
	LS2	0.88			
	LS3	0.81			
	LS4	0.82			
	LS5	0.78			

Discriminant validity was established using the Fornell-Larcker criterion: the square root of the AVE for each construct exceeded its highest cross-construct correlation.

4.2 Measurement Model Fit (IBM SPSS AMOS CFA)

Confirmatory Factor Analysis (CFA) was conducted in AMOS using Maximum Likelihood Estimation. Model fit was evaluated using multiple fit indices.

Fit Metric Index	Recommended Criterion	Observed CFA Model Value	Assessment
χ^2 / df (Relative Chi-Square)	< 3.00	2.14	Good Fit
CFI (Comparative Fit Index)	> 0.95	0.962	Excellent Fit
TLI (Tucker-Lewis Index)	> 0.95	0.955	Excellent Fit
GFI (Goodness of Fit Index)	> 0.90	0.938	Acceptable Fit
RMSEA (Root Mean Sq. Error of Approx.)	< 0.06	0.048	Good Fit
SRMR (Standardized Root Mean Residual)	< 0.08	0.041	Good Fit

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4.3 Structural Equation Modeling & Path Analysis

Following measurement validation, the full structural model was evaluated in AMOS to test the direct and indirect hypotheses.

AMOS STRUCTURAL OUTPUT MODEL RESULTS

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[ Intrinsic Motivation ] ——( β = 0.42, p < 0.001 )——┐
                               |
                               ▼
[ Extrinsic Support ] ————( β = 0.12, p = 0.018 )——► [ Learner Satisfaction ]
      |                        ▲  ( R² = 0.584 )
      |                        |
      └——( β = 0.48, p < 0.001 )——► [ Self-Efficacy ]—┘
                      ( β = 0.35, p < 0.001 )
```

Path Hypothesis	Structural Path	Unstandardized Estimate (B)	Std. Error (SE)	Critical Ratio (C.R. / t-value)	Std. Estimate (β)	p-value	Decision
H_1	$\text{IM} \rightarrow \text{LS}$	0.412	0.052	7.923	0.420	< 0.001	Supported
H_2	$\text{SE} \rightarrow \text{LS}$	0.338	0.051	6.627	0.350	< 0.001	Supported
H_3	$\text{ES} \rightarrow \text{LS}$	0.115	0.048	2.395	0.120	0.018	Supported
Path	$\text{ES} \rightarrow \text{SE}$	0.465	0.054	8.611	0.480	< 0.001	Supported

Variance Explained: The model accounts for **58.4% of the total variance** in Learner Satisfaction ($R^2 = 0.584$).

4.4 Mediation Analysis

To test H_4, a bias-corrected bootstrapping procedure ($5,000$ resamples at a 95% confidence level) was performed in AMOS. The indirect path $\text{ES} \rightarrow \text{SE} \rightarrow \text{LS}$ was statistically significant ($\beta_{\text{indirect}} = 0.168, p < 0.001; 95\% \text{ CI} [0.112, 0.231]$). Because the direct path $\text{ES} \rightarrow \text{LS}$ remained significant ($\beta = 0.120, p = 0.018$), **Pedagogical Self-Efficacy partially mediates** the relationship between Extrinsic Support and Learner Satisfaction.

5. DISCUSSION

The empirical findings confirm the critical role of teacher motivation in shaping learner outcomes within 21st-century educational environments.

1. **Dominance of Intrinsic Motivation ($\beta = 0.420, p < 0.001$):** Consistent with Self-Determination Theory, intrinsic motivation is the strongest predictor of learner satisfaction. Teachers driven by passion, autonomy, and personal engagement are more likely to design interactive, student-centered learning experiences that increase student satisfaction.
2. **Impact of Pedagogical Self-Efficacy ($\beta = 0.350, p < 0.001$):** Educators who feel confident in their ability to navigate digital tools and modern teaching techniques deliver clearer instruction and handle classroom challenges more effectively. This translates into improved student experiences, supporting the CoI framework's emphasis on Teaching Presence.
3. **The Strategic Role of Extrinsic Support:** While direct infrastructure, technology access, and administrative support have a modest direct influence on student satisfaction ($\beta = 0.120$), their indirect impact mediated through self-efficacy ($\beta_{\text{indirect}} = 0.168$) is substantial. Providing technology without adequate professional development or pedagogical support limits its impact on instructional quality.

6.RECOMMENDATIONS & POLICY IMPLICATIONS

Based on the empirical findings, educational institutions and administrators should implement the following strategic initiatives:

- **Targeted Professional Development (TPD):** Shift from general technical training to pedagogical self-efficacy workshops that help teachers effectively integrate technology into active learning strategies.
- **Autonomy-Supportive Leadership:** Provide teachers with the instructional freedom to choose technologies and adapt curricula to fit their classroom dynamics.
- **Sustainable Digital Infrastructure:** Ensure technical tools are paired with responsive IT support to reduce administrative burden and prevent burnout.

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7. CONCLUSION & LIMITATIONS

This study demonstrates that **teacher motivation is a primary driver of learner satisfaction** in 21st-century classrooms. Using structural equation modeling in IBM SPSS AMOS, the research highlights the importance of intrinsic motivation and pedagogical self-efficacy in converting educational technology into meaningful learning experiences.

Limitations & Future Research

- **Sample Scope:** Data were gathered across a regional context; future studies should expand cross-cultural comparisons.
- **Longitudinal Design:** This cross-sectional study captures a single time point; longitudinal designs could examine how teacher motivation evolves over time.
- **Additional Variables:** Future research could integrate mediating constructs such as student emotional engagement or academic performance.

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