International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 21s, 2025
https://theaspd.com/index.php

Individual Innovativeness Among Prospective Teachers in India a Multi-Component Analysis

Sumanya Debbarma[1], Priyank Kumar Shivam[2]
[1]Ph.D. Research Scholar, Faculty of Education, The ICFAI University Tripura, India,
debbarmasumanya@gmail.com
[2]Assistant Professor, Faculty of Education, The ICFAI University Tripura, India

Abstract
Purpose: *This study investigates the multi-dimensional components contributing to individual innovativeness among prospective teachers in India, addressing the critical need for innovation-ready educators in the context of educational transformation.*
Methodology: *Using a comprehensive 24-item Likert scale questionnaire based on validated theoretical frameworks, data were collected from 100 prospective teachers. Linear regression analysis examined eight key predictors of individual innovativeness: Innovation Self-Efficacy, Risk-Taking Propensity, Openness to Experience, Opinion Leadership, Reflective Practice, Technology Self-Efficacy, and Creative Problem-Solving.*
Findings: *The regression model demonstrated exceptional explanatory power ($R^2 = .896$, Adjusted $R^2 = .887$, $F(8,91) = 98.3$, $p < .001$), accounting for 89.6% of variance in individual innovativeness. All eight predictors showed significant positive relationships, with Creative Problem-Solving ($\beta = 1.149$, $p < .001$) and Innovation Self-Efficacy ($\beta = 1.143$, $p < .001$) emerging as the strongest predictors.*
Implications: *The findings underscore the multifaceted nature of teacher innovativeness and provide evidence-based guidance for teacher education programs. The strong predictive model suggests that targeted interventions focusing on these components can effectively enhance innovation readiness among prospective teachers.*
Keywords: *Individual innovativeness, prospective teachers, teacher education, innovation adoption, India*

1. INTRODUCTION

The rapidly evolving educational landscape demands teachers who can adapt, innovate, and implement transformative pedagogical practices (Thurlings et al., 2015). In India, with the implementation of the National Education Policy (NEP) 2020 and the Digital India initiative, the need for innovation-ready teachers has become paramount. Despite policy emphasis on educational innovation, comprehensive empirical evidence on the factors contributing to individual innovativeness among Indian prospective teachers remains limited.

Individual innovativeness, defined as "the degree to which an individual is relatively earlier in adopting new ideas than other members of a system" (Rogers, 2003, p. 22), represents a critical competency for 21st-century educators. Previous research has identified various components influencing teacher innovativeness, yet few studies have examined these factors holistically within the Indian context.

This study addresses this gap by investigating the multi-dimensional components of individual innovativeness among prospective teachers in India. Specifically, we examine how eight theoretically-grounded factors contribute to overall innovativeness, providing empirical evidence to inform teacher education reform and professional development initiatives.

2. Theoretical Framework and Literature Review

2.1 Conceptualizing Teacher Innovativeness

Teacher innovativeness encompasses both the willingness and ability to adopt, adapt, and implement novel educational practices (Thurlings et al., 2015). Building on Rogers' (2003) Diffusion of Innovations theory, we conceptualize innovativeness as a multi-dimensional construct influenced by individual, organizational, and socio-cultural factors.

2.2 Components of Individual Innovativeness

2.2.1 Innovation Self-Efficacy

Bandura's (1997) Social Cognitive Theory positions self-efficacy as a crucial determinant of innovative behavior. Innovation self-efficacy specifically refers to teachers' confidence in their ability to generate and implement novel teaching approaches (Klaeijsen et al., 2018).

2.2.2 Risk-Taking Propensity

Innovation inherently involves uncertainty and potential failure. Teachers' willingness to take calculated risks significantly influences their adoption of innovative practices (Çoklar & Özbek, 2017).

2.2.3 Openness to Experience

As one of the Big Five personality traits, openness to experience predicts individuals' receptiveness to novel ideas and approaches (Messmann & Mulder, 2011).

2.2.4 Opinion Leadership

Opinion leaders play crucial roles in innovation diffusion within educational settings. Teachers recognized as opinion leaders often facilitate peer adoption of innovative practices (Rogers, 2003).

2.2.5 Reflective Practice

Schön's (1983) concept of reflective practice emphasizes continuous learning through systematic reflection on teaching experiences, fostering innovation through iterative improvement.

2.2.6 Technology Self-Efficacy

In the digital age, confidence in using educational technology represents a critical component of teacher innovativeness (Chou et al., 2019).

2.2.7 Creative Problem-Solving

The ability to generate novel solutions to educational challenges distinguishes innovative teachers from their peers (Huang et al., 2019).

2.3 Research Questions

This study addresses the following research questions:

1. To what extent do the identified components predict individual innovativeness among prospective teachers?
2. Which components emerge as the strongest predictors of innovativeness?
3. What is the collective explanatory power of these components in understanding teacher innovativeness?

3. METHODOLOGY

3.1 Design of the Study

This study employed a descriptive survey cum regression analysis design. The descriptive survey approach was used to assess the levels of individual innovativeness components among prospective teachers, while regression analysis examined the predictive relationships between these components and overall innovativeness.

3.2 Sample

The sample consisted of 100 prospective teachers from the Institute of Advanced Studies in Education (IASE), Tripura. The participants were enrolled in the Bachelor of Education (B.Ed.) program during the academic year 2023-2024.

4. RESULTS

4.1 Model Fit and Overall Significance

The linear regression model demonstrated exceptional fit to the data, explaining 89.6% of the variance in individual innovativeness ($R^2 = .896$, Adjusted $R^2 = .887$). The overall model was highly significant, $F(8, 91) = 98.3$, $p < .001$, indicating that the eight predictors collectively provide substantial explanatory power for understanding individual innovativeness among prospective teachers.

4.2 Individual Predictor Contributions

Table 1 presents the regression coefficients for each predictor variable.

Table 1 Linear Regression Coefficients for Predictors of Individual Innovativeness

Predictor	B	SE	95% CI	t	p
(Intercept)	7.540	2.744	[2.089, 12.99]	2.75	.007

Innovation Self-Efficacy	1.143	0.111	[0.923, 1.36]	10.31	<.001
Risk-Taking Propensity	0.971	0.113	[0.747, 1.19]	8.60	<.001
Openness to Experience	0.892	0.118	[0.659, 1.13]	7.58	<.001
Opinion Leadership	0.987	0.118	[0.753, 1.22]	8.37	<.001
Opinion Leadership (2)	1.086	0.119	[0.849, 1.32]	9.10	<.001
Reflective Practice	0.939	0.124	[0.694, 1.18]	7.59	<.001
Technology Self-Efficacy	0.999	0.132	[0.737, 1.26]	7.58	<.001
Creative Problem-Solving	1.149	0.112	[0.928, 1.37]	10.30	<.001

All predictors demonstrated significant positive relationships with individual innovativeness (all $p < .001$). Creative Problem-Solving ($\beta = 1.149$) and Innovation Self-Efficacy ($\beta = 1.143$) emerged as the strongest predictors, followed by Opinion Leadership ($\beta = 1.086$) and Technology Self-Efficacy ($\beta = 0.999$).

4.3 Analysis of Variance

The omnibus ANOVA revealed significant contributions from each predictor:

- Innovation Self-Efficacy: $F(1, 91) = 106.3$, $p < .001$
- Creative Problem-Solving: $F(1, 91) = 106.1$, $p < .001$
- Opinion Leadership (2): $F(1, 91) = 82.8$, $p < .001$
- Risk-Taking Propensity: $F(1, 91) = 74.0$, $p < .001$
- Opinion Leadership: $F(1, 91) = 70.0$, $p < .001$
- Reflective Practice: $F(1, 91) = 57.6$, $p < .001$
- Technology Self-Efficacy: $F(1, 91) = 57.5$, $p < .001$
- Openness to Experience: $F(1, 91) = 57.5$, $p < .001$

5. DISCUSSION

5.1 Addressing the Research Questions

5.1.1 Research Question 1: To what extent do the identified components predict individual innovativeness among prospective teachers?

The findings reveal that all eight components are significant predictors of individual innovativeness among prospective teachers at IASE, Tripura. The regression model demonstrated exceptional predictive power with $R^2 = .896$ (Adjusted $R^2 = .887$), indicating that these components collectively explain 89.6% of the variance in individual innovativeness. This extraordinarily high explanatory power suggests that the identified components comprehensively capture the essential elements of teacher innovativeness.

Each component showed highly significant predictive relationships (all $p < .001$), with regression coefficients ranging from $\beta = 0.892$ (Openness to Experience) to $\beta = 1.149$ (Creative Problem-Solving). These strong positive relationships confirm that prospective teachers who score higher on these components demonstrate greater overall innovativeness.

5.1.2 Research Question 2: Which components emerge as the strongest predictors of innovativeness?

The analysis revealed a clear hierarchy among the predictors:

Top-Tier Predictors:

- Creative Problem-Solving ($\beta = 1.149$, $t = 10.30$, $p < .001$)
- Innovation Self-Efficacy ($\beta = 1.143$, $t = 10.31$, $p < .001$)

These two components emerged as the most powerful predictors, with nearly identical coefficients above 1.14, suggesting that a one-unit increase in either component predicts more than a one-unit increase in overall innovativeness.

Second-Tier Predictors:

- Opinion Leadership (2) ($\beta = 1.086$, $t = 9.10$, $p < .001$)
- Technology Self-Efficacy ($\beta = 0.999$, $t = 7.58$, $p < .001$)
- Opinion Leadership ($\beta = 0.987$, $t = 8.37$, $p < .001$)
- Risk-Taking Propensity ($\beta = 0.971$, $t = 8.60$, $p < .001$)

Third-Tier Predictors:

- Reflective Practice ($\beta = 0.939$, $t = 7.59$, $p < .001$)

- Openness to Experience ($\beta = 0.892$, $t = 7.58$, $p < .001$)

While all predictors are highly significant, this hierarchy provides crucial guidance for prioritizing interventions in teacher education programs.

5.1.3 Research Question 3: What is the collective explanatory power of these components in understanding teacher innovativeness?

The collective explanatory power is exceptionally strong. The overall model test ($F(8, 91) = 98.3$, $p < .001$) confirms that these eight components together provide a comprehensive framework for understanding individual innovativeness. The high R^2 value of .896 is particularly noteworthy in educational research, where human behavior typically shows greater variability.

The omnibus ANOVA results further support this conclusion, with individual F-values ranging from 57.5 to 106.3, all significant at $p < .001$. This indicates that each component makes a unique and substantial contribution to the model, with minimal redundancy among predictors.

5.2 Theoretical Implications

The findings strongly validate the multi-dimensional conceptualization of teacher innovativeness. The exceptional model fit suggests that these eight components, drawn from diverse theoretical frameworks (Rogers' Diffusion of Innovations, Bandura's Social Cognitive Theory, and Schön's Reflective Practice), work synergistically to explain innovation readiness.

The prominence of Creative Problem-Solving and Innovation Self-Efficacy as top predictors aligns with contemporary views of innovation as requiring both cognitive capabilities and motivational beliefs. This dual importance suggests that teacher education must address both skill development and confidence building simultaneously.

5.3 Practical Implications for Teacher Education at IASE, Tripura

Based on the hierarchical findings, IASE Tripura should prioritize:

Immediate Focus Areas:

1. **Creative Problem-Solving Development**: Implement design thinking workshops, case-based learning, and innovation challenges
2. **Innovation Self-Efficacy Building**: Provide supervised innovation implementation experiences with structured support and feedback

Secondary Focus Areas: 3. **Leadership Development**: Create peer mentoring programs and collaborative innovation projects 4. **Technology Integration**: Ensure hands-on experience with educational technologies and digital pedagogies

Supportive Elements: 5. **Reflective Practice**: Integrate reflective journals and peer observation protocols 6. **Risk-Taking Culture**: Establish safe spaces for experimentation with celebration of productive failures

5.4 Contextual Considerations for Tripura

The high significance of Technology Self-Efficacy ($\beta = 0.999$) is particularly relevant given Tripura's efforts to bridge the digital divide through various state and national initiatives. The strong showing of Opinion Leadership components suggests that peer influence plays a crucial role in innovation diffusion within the IASE community, indicating the potential effectiveness of peer-led innovation initiatives.

The relatively lower (though still highly significant) coefficient for Openness to Experience ($\beta = 0.892$) may reflect the traditional educational culture in the region, suggesting the need for gradual cultural shift alongside skill development.

6. Limitations and Future Research

6.1 Limitations

1. Cross-sectional design limits causal inferences
2. Self-reported measures may introduce response bias
3. Sample size (N=100) restricts generalizability
4. Regional variations within India not fully captured

6.2 Future Research Directions

1. Longitudinal studies tracking innovativeness development over time
2. Multi-level modeling incorporating institutional factors
3. Qualitative investigations of innovation implementation processes
4. Cross-cultural comparisons with other developing nations
5. Intervention studies testing targeted enhancement programs

7. CONCLUSION

This study provides compelling evidence for a multi-component model of individual innovativeness among prospective teachers in India. The identification of eight significant predictors, collectively explaining 89.6% of variance, offers a robust framework for understanding and enhancing teacher innovativeness. As India pursues educational transformation through NEP 2020 and digital initiatives, these findings provide actionable insights for preparing innovation-ready teachers.

The strong predictive relationships identified suggest that targeted interventions focusing on creative problem-solving, innovation self-efficacy, and opinion leadership development can substantially enhance prospective teachers' readiness for educational innovation. Teacher education institutions should integrate these components systematically into their curricula, assessment practices, and professional development programs.

Fostering individual innovativeness among prospective teachers represents a critical investment in educational quality and transformation. By understanding and nurturing the multi-dimensional nature of innovativeness, we can better prepare teachers to meet the evolving challenges of 21st-century education in India and beyond.

REFERENCES

1. Bandura, A. (1997). Self-efficacy: The exercise of control. W.H. Freeman.
2. Chou, C. M., Shen, C. H., Hsiao, H. C., & Shen, T. C. (2019). Factors influencing teachers' innovative teaching behaviour with information and communication technology (ICT): The mediator role of organizational innovation climate. Educational Psychology, 39(1), 65-85.
3. Çoklar, A. N., & Özbek, A. (2017). Analyzing of relationship between teachers' individual innovativeness levels and their TPACK self-efficacies. Journal of Human Sciences, 14(1), 427-440.
4. Huang, X., Lee, J. C. K., & Dong, X. (2019). Mapping the factors influencing creative teaching in mainland China: An exploratory study. Thinking Skills and Creativity, 31, 79-90.
5. Klaeijsen, A., Vermeulen, M., & Martens, R. (2018). Teachers' innovative behaviour: The importance of basic psychological need satisfaction, intrinsic motivation, and occupational self-efficacy. Scandinavian Journal of Educational Research, 62(5), 769-782.
6. Messmann, G., & Mulder, R. H. (2011). Innovative work behaviour in vocational colleges: Understanding how and why innovations are developed. Vocations and Learning, 4, 63-84.
7. Rogers, E. M. (2003). Diffusion of innovations (5th ed.). Free Press.
8. Schön, D. A. (1983). The reflective practitioner: How professionals think in action. Basic Books.
9. Thurlings, M., Evers, A. T., & Vermeulen, M. (2015). Toward a model of explaining teachers' innovative behavior: A literature review. Review of Educational Research, 85(3), 430-471.