

ISSN: 0974-2123

INDIAN EDUCATIONAL RESEARCHER

International Peer Reviewed Biannual Open Access Journal

VOLUME 19

ISSUE-1

JANUARY-JUNE-2026



STELLA MATUTINA COLLEGE OF EDUCATION

ASHOK NAGAR, CHENNAI - 600083, TAMILNADU, INDIA

INDIAN EDUCATIONAL RESEARCHER

Stella Matutina College of Education

Ashok Nagar, Chennai- 600 083, Tamil Nadu, India.

www.smce-chennai.com

E-mail: smcedn@gmail.com

Editorial Board

Patron

Rev. Dr. Sr. Ruby Alangara Mary

Secretary

Stella Matutina College of Education,

Chennai- 600 083.

Editor-in-Chief

Dr. Sr. Irudaya Mary

Principal i/c

Stella Matutina College of Education,

Chennai - 600 083.

Editor

Dr. S. Arockia Elizabeth Josephine

Assistant Professor of Biology

Stella Matutina College of Education,

Chennai-600 083.

Associate Editor

Dr. Sr. Sheeja Vayola

Assistant Professor of Education

Stella Matutina College of Education,

Chennai-600 083.

Editorial Advisory Board

- Dr. Rajaganesan Dakshinamoorthi, Former. Prof. & Head, Dept. of Edn. University of Madras, Chennai. S.I.T.U. Council of Educational Research, Tamil Nadu, India.
- Dr. Annaraja, Former Prof. & Head, Dept. of Education, St Xavier College of Education, Palayamkottai, Tirunelveli, Tamil Nadu, India.
- Dr. Nachimuthu, Prof. & Head, Dept. of Education, Periyar University, Salem, Tamil Nadu, India.
- Dr. E. Ramganes, Prof. and Head and Coordinator, Dept. of Educational Technology, Bharathidasan University, Tiruchirappalli, Tamil Nadu, India.
- Dr. B. William Dharma Raja, Former Associate Professor & Head i/c Dept. of Education. Tamilnadu Open University, Chennai, Tamil Nadu, India.
- Dr. Malathi Rajagopalan, Reader (Former), Stella Matutina College of Education, Chennai.
- Dr. Radha Mohan, Former Principal, Rajalakshmi CoHege of Education, Thandalam, Chennai, Tamil Nadu, India.
- Dr. Prabu Shankar, Associate Professor and Head, Institute of Advanced Study in Education, Saidapet, Chennai, Tamil Nadu, India.
- Dr. T. Sivasakthi Rajammal, Assistant Professor and Head, Department of Educational Psychology, Tamil Nadu Teachers Education, University, Chennai, Tamil Nadu, India.

Length of manuscript

Manuscripts should be approximately 1500-2000 words.

Title/Heading

Include the title of the article, name of author(s), institutional mailing address (if it is a part of a department, please include the name of the institution, city, state, zip code, and country), or other affiliation. Please include an e-mail address at which we can contact you.

Abstract

An informative, comprehensive abstract of 75 to 150 words must accompany the manuscript. This abstract should summarize succinctly the major points of the paper.

Citations

The format of citations, references, and other manuscript details should be prepared in accordance with the latest edition of the Publication Manual of the American Psychological Association (APA). Authors are advised to consult the APA Manual and other authorized online resources for guidance on APA style.

Tables and Figures

All tables and figures must be submitted in publication quality. Tables and figures should be prepared on separate sheets at the end of the running text. Indicate in the text where they are to be inserted. Number and type captions at the top of each table.

Manuscripts can also be submitted via email where possible. The Indian Educational Researcher requires that manuscripts be sent as email attachments in one of the following formats: MS word or RTF. All files submitted must be uncompressed. No ZIP, SIT, etc. files will be accepted.

Manuscripts should be accompanied by a declaration stating that the work is original, has not been previously published, and is not under consideration for publication elsewhere. Authors are required to submit a plagiarism report indicating a similarity index of not more than 10%.

Manuscripts and editorial correspondence should be sent to:

The Editor-in-Chief, Indian Educational Researcher, Stella Matutina College of Education, Ashok Nagar, Chennai - 600 083., Tamil Nadu, India. E-mail: info@smcedjournal.com

Editorial Policy

Indian Educational Researcher is a research journal that publishes articles related to current issues and debates in the field of national and international education development. It encourages submissions from students, academics, practitioners and others interested in joining this international journal community.

All submitted manuscripts will be externally reviewed. Publication decisions are made ultimately by the Editorial Board. The accuracy of information presented in the submitted articles is the responsibility of the author/s. The views presented in the journal are the personal views of the author/s and do not necessarily reflect the views of the journal's Editorial Board of Stella Matutina College of Education.

Copyright Policy

Unless otherwise noted, copyrights for the texts which comprise all issues of the journal are held by Indian Educational Researcher.

CONTENTS

EDITORIAL 1**RESEARCH ARTICLES****1. ICT Attitudes as a Predictor of Metacognitive Awareness in Higher Secondary Students 2**

Dr. G. Umamageswari

Assistant Professor of Education, Stella Matutina College of Education, Chennai, TN, India.

2. Career Maturity of Higher Secondary Students in Relation to their Parental Support 13

Dr. T. Sivasakthi Rajammal,

Assistant Professor & Head, Department of Educational Psychology,
Tamil Nadu Teachers Education University, Chennai, TN, India.**3. Correlation between Social Engagement (Being a Social Butterfly) and Emotional Wellbeing of Student-Teachers 23**

Jennifer.M & Dr.A.H.Komala

Research Scholar & 2 Assistant Professor of Economics -Education

N.K.T. National College of Education for Women, Chennai, TN, India.

4. Examination Anxiety in Relation to Academic Achievement among Higher Secondary School Students 35

Dr.s. Arockia Elizabeth Josephine

Assistant Professor of Biology

Stella Matutina College of Education, Chennai, TN, India.

5. Digital Pedagogical Skills, Self-Efficacy, and Teaching Effectiveness among Pre-Service Teachers: A Structural Equation Modeling Approach 44

Dr. P. Subramanian

Assistant professor, Department of Educational Planning and Administration,
Tamil Nadu Teachers Education University, Chennai, TN, India.**CONCEPTUAL ARTICLES****6. Artificial Intelligence and the Illusion of Learning: Rethinking Knowledge Formation in Contemporary Education 55**

Ebin Christopher Harris

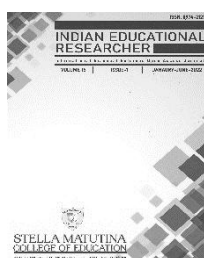
University of St. Thomas, Houston, Texas, USA.

7. Using Digital Tools in Education 61

Dr. V. Sheeja Vayola

Assistant Professor of Education

Stella Matutina College of Education, Chennai, TN, India.



EDITORIAL

The Editorial Board of *Indian Educational Researcher* is pleased to present this issue, which brings together scholarly contributions addressing contemporary concerns in educational research and practice. In an era characterized by rapid technological advancement, evolving learning environments, and increasing attention to student wellbeing, educational research plays a critical role in informing policy, practice, and innovation.

The articles featured in this issue reflect diverse perspectives on learner development, educational psychology, and technology-enhanced learning. The empirical studies examine ICT attitudes and metacognitive awareness among higher secondary students, parental support and career maturity, social engagement and emotional wellbeing among student-teachers, examination anxiety and academic achievement, and the role of digital pedagogical skills and self-efficacy in enhancing teaching effectiveness among pre-service teachers. Together, these studies deepen our understanding of the cognitive, emotional, social, and technological factors shaping educational experiences and outcomes.

The issue further includes conceptual discussions on emerging themes that are increasingly relevant to educational discourse. The article on Artificial Intelligence and the Illusion of Learning offers a critical examination of AI's growing influence on knowledge construction and educational processes. Complementing this discussion, the article on digital tools in education highlights the opportunities and challenges associated with technology integration in contemporary classrooms.

Collectively, the contributions in this issue underscore the importance of fostering meaningful learning experiences that balance technological innovation with human development. They provide valuable insights for researchers, teacher educators, practitioners, and policymakers committed to enhancing educational quality and promoting learner success.

The Editorial Board extends its sincere appreciation to all authors for their scholarly contributions and to the reviewers whose expertise and commitment have ensured the quality and rigor of the publication. We wish our readers an engaging and intellectually rewarding reading experience.

Editorial Board

Indian Educational Researcher

Research Article

ICT Attitudes as a Predictor of Metacognitive Awareness in Higher Secondary Students

Dr. G. Umamageswari

Assistant Professor of Education, Stella Matutina College of Education, Chennai, TN, India.

ORCID: <https://orcid.org/0000-0002-8417-2365>

DOI: <https://doi.org/10.34293/0974-2123.v19n1.001>

Abstract

The integration of Information and Communication Technology (ICT) in education has transformed teaching-learning processes, yet limited research exists on how students' attitudes toward ICT relate to their metacognitive awareness. This study examined the relationship between attitude towards ICT and metacognitive awareness among 300 higher secondary students in Chennai, India. Using a descriptive correlational design, data were collected through standardized tools: the Attitude towards ICT Scale (Martinez, Abeledo & Machado, 2021) and the Metacognitive Awareness Inventory (MAI) adapted for secondary students (Schraw & Dennison, 1994). Descriptive statistics, Pearson's product-moment correlation, and simple linear regression were employed for analysis. Results revealed a significant positive but moderate correlation between attitude towards ICT and metacognitive awareness ($r = 0.324$, $p < 0.001$). Regression analysis indicated that attitude towards ICT explained approximately 10.5% of the variance in metacognitive awareness ($R^2 = 0.105$, $\beta = 0.324$, $p < 0.001$). No significant differences were found in either variable across gender, medium of instruction, stream of study, class level, type of school management, or family type ($p > 0.05$). These findings suggest that positive attitudes toward ICT contribute meaningfully to metacognitive awareness, though other cognitive and contextual factors may play substantial roles. The study discusses implications for educational practice and recommendations for future research.

Keywords: Attitude towards ICT, metacognitive awareness, higher secondary students, correlation, regression analysis, digital learning, self-regulated learning

Introduction

Education in the 21st century has been fundamentally transformed by the rapid integration of Information and Communication Technology (ICT). As Nelson Mandela famously stated, "Education

is the most powerful weapon which you can use to change the world." In contemporary contexts, this weapon is increasingly digital, with technology reshaping how students learn, teachers instruct, and educational institutions operate. The National Education Policy (NEP) 2020 in India emphasizes the importance of digital content, infrastructure, and resource development to meet the evolving demands of e-learning in higher education (Government of India, 2020).

The convergence of telecommunications, computers, and digital technologies has created unprecedented opportunities for educational enrichment. ICT in education encompasses a broad range of tools including computers, the internet, broadcasting technologies, and telephony that facilitate the creation, storage, dissemination, and management of information (UNESCO, 2021). According to the International Society for Technology in Education (ISTE, 2022), ICT integration in educational settings enhances learning through interactive experiences, personalized instruction, and access to diverse digital resources.

Metacognitive awareness, defined as "the ability to reflect upon, understand, and control one's learning processes" (Schraw & Dennison, 1994, p. 460), represents another critical dimension of student development. This construct encompasses both knowledge of cognition (declarative, procedural, and conditional knowledge) and regulation of cognition (planning, monitoring, and evaluation). Flavell (1979), who pioneered research in this area, described metacognition as "cognition about cognitive phenomena" or "thinking about thinking." Metacognitive awareness influences academic performance, problem-solving abilities, and lifelong learning by enabling students to become self-regulated learners (Zimmerman, 2002).

The intersection of ICT attitudes and metacognitive awareness represents a critical area of inquiry. Digital learning environments require students to navigate vast information resources, evaluate source credibility, and manage their own learning trajectories—all processes that demand metacognitive engagement (Azevedo & Aleven, 2013). While extensive international research has explored ICT utilization and digital literacy, studies examining their relationship with metacognitive awareness among Indian students remain scarce. Anthony et al. (2019) found significant relationships between students' technology attitudes and their self-regulated learning skills in Malaysian higher education. Similarly, Broadbent and Poon (2015) conducted a meta-analysis revealing that metacognitive strategies are among the strongest predictors of success in online learning environments.

The present study addresses this research gap by investigating the relationship between higher secondary students' attitudes towards ICT and their metacognitive awareness in Chennai, India.

Understanding this relationship is essential for educators, policymakers, and curriculum developers seeking to optimize technology integration and enhance students' self-regulatory capacities in digital learning environments.

Objectives

The study was guided by the following objectives:

1. To explore the relationship between attitude towards ICT and metacognitive awareness.
2. To determine whether attitude towards ICT predicts metacognitive awareness among higher secondary students.

Hypotheses

Based on the objectives, the following hypotheses were formulated:

- **H₀₁:** There is no significant relationship between attitude towards ICT and metacognitive awareness among higher secondary students.
- **H₀₂:** Attitude towards ICT does not significantly predict metacognitive awareness among higher secondary students.

Methodology

Research Design

This study employed a descriptive correlational research design. According to Creswell and Creswell (2018), research design constitutes the plan or proposal to conduct research, involving the intersection of philosophy, strategies of inquiry, and specific methods. The descriptive approach was appropriate as the study aimed to describe the characteristics of higher secondary students' attitudes and metacognitive awareness while examining relationships between variables (Kerlinger, 1986).

Sample

The sample consisted of 300 higher secondary students randomly selected from government, government-aided, and private schools in Chennai district, Tamil Nadu. The sample distribution included 141 boys (47%) and 159 girls (53%). Regarding medium of instruction, 198 students (66%) studied in English medium and 102 (34%) in Tamil medium. The stream of study distribution comprised 211 science students (70.3%) and 89 commerce students (29.7%). Class-wise, 94 students (31.3%) were in Plus One (Grade 11) and 206 (68.7%) in Plus Two (Grade 12). Family type distribution showed 24 students (8%) from joint families and 276 (92%) from nuclear families. School

management types were equally represented with 100 students (33.3%) each from government, government-aided, and private schools.

Instruments

Three instruments were employed for data collection:

Personal Data Sheet: Developed by the investigator to collect demographic information including gender, stream of study, medium of instruction, type of school, class, and family type.

Attitude towards ICT Scale: Developed and standardized by Martinez, Abeledo and Machado (2021), this scale consists of 24 items distributed across three dimensions: cognitive (8 items), affective (8 items), and behavioral (8 items). The scale employs a five-point Likert format ranging from "Completely Agree" (5) to "Completely Disagree" (1), with reverse scoring for negative items (1, 8, 9, 11, 12, 15, 18, 19, 21, 22, 24). Cronbach's alpha coefficients ranged from 0.7 to 0.92, indicating satisfactory reliability.

Metacognitive Awareness Inventory (MAI): Originally developed by Schraw and Dennison (1994) for adults, this study utilized the adapted version for secondary students validated by Balcikanli (2011). The inventory comprises 30 items across two dimensions: knowledge of cognition (17 items) including declarative, procedural, and conditional knowledge; and regulation of cognition (13 items) including planning, monitoring, and evaluation. Responses are recorded on a five-point Likert scale from "Always true" (5) to "Never true" (1). The adapted scale demonstrated strong reliability with Cronbach's alpha of 0.89 for the overall inventory.

Procedure

After obtaining permission from school authorities, the investigator administered the questionnaires to students with assistance from respective teachers. Clear instructions were provided regarding response procedures. Students completed the personal data sheet followed by the two scales. Approximately 40 minutes were required for completion. Data collection occurred over four weeks across five schools in Chennai.

Data Analysis

Statistical analysis was conducted using SPSS software version 26. Descriptive statistics (means and standard deviations) were computed for both variables. Pearson's product-moment correlation examined the relationship between attitude towards ICT and metacognitive awareness. Simple linear regression analysis determined the predictive capacity of attitude towards ICT on

metacognitive awareness. Independent samples t-tests and one-way ANOVA examined differences across demographic variables. Statistical significance was set at $p < 0.05$.

Results

Correlation Analysis

H₀₁: There is no significant relationship between attitude towards ICT and metacognitive awareness.

Pearson's product-moment correlation was computed to test this hypothesis.

Table 2: Correlation between Attitude towards ICT and Metacognitive Awareness

Variable	N	Pearson's r	p-value
Attitude Towards ICT and Metacognitive Awareness	300	0.324	<0.001**

** $p < 0.01$

The correlation coefficient ($r = 0.324$) indicates a moderate positive relationship between attitude towards ICT and metacognitive awareness. The p-value of less than 0.001 is below 0.05, leading to rejection of the null hypothesis. Therefore, a significant moderate positive correlation exists between the two variables.

Regression Analysis

H₀₂: Attitude towards ICT does not significantly predict metacognitive awareness.

Simple linear regression analysis was conducted to examine the predictive relationship.

Table 3: Simple Linear Regression Analysis for Attitude towards ICT Predicting Metacognitive Awareness

Predictor	B	SE	β	t	p	R ²
(Constant)	70.24	6.83		10.28	<0.001	
Attitude Towards ICT	0.56	0.09	0.324	5.91	<0.001**	0.105

** $p < 0.01$

The regression analysis revealed that attitude towards ICT significantly predicts metacognitive awareness, $F(1, 298) = 34.93$, $p < 0.001$. The unstandardized coefficient ($B = 0.56$)

indicates that for every one-unit increase in attitude towards ICT scores, metacognitive awareness increases by 0.56 units. The standardized coefficient ($\beta = 0.324$) represents the moderate positive relationship. The R^2 value of 0.105 indicates that attitude towards ICT explains approximately 10.5% of the variance in metacognitive awareness. This suggests that 89.5% of the variance in metacognitive awareness is attributable to other factors.

Discussion

The primary finding of this study is the significant moderate positive correlation between attitude towards ICT and metacognitive awareness among higher secondary students ($r = 0.324$, $p < 0.001$). This result aligns with previous research by Anthony et al. (2019), who found that students' technology attitudes significantly predicted their self-regulated learning skills in Malaysian higher education contexts. Similarly, Broadbent and Poon (2015) conducted a meta-analysis revealing that metacognitive strategies are among the strongest predictors of success in online learning environments, suggesting a bidirectional relationship between technology engagement and metacognitive development.

The moderate correlation magnitude ($r = 0.324$) is theoretically meaningful and exceeds the weak correlation often found in educational psychology research. This suggests that students who hold more positive attitudes toward ICT tend to demonstrate greater metacognitive awareness. This relationship can be explained through several theoretical lenses. According to Azevedo and Aleven (2013), digital learning environments inherently demand metacognitive engagement as students must navigate hypermedia, evaluate information sources, and monitor their comprehension without constant teacher guidance. Students with positive ICT attitudes may be more willing to engage deeply with these environments, thereby exercising and developing their metacognitive skills.

The regression analysis revealed that attitude towards ICT explains 10.5% of the variance in metacognitive awareness, indicating that 89.5% is attributable to other factors. This finding is consistent with theoretical frameworks emphasizing the multifaceted nature of metacognition. Flavell's (1979) model of metacognition identifies multiple components including metacognitive knowledge, metacognitive experiences, goals, and strategies. More recently, Efklides (2008) proposed the Metacognitive and Affective Model of Self-Regulated Learning (MASRL), which emphasizes interactions among cognition, metacognition, affect, and motivation. These theoretical perspectives suggest that metacognitive awareness emerges from complex interactions among cognitive, motivational, and contextual factors beyond ICT attitudes alone.

The finding that ICT attitudes explain 10.5% of variance in metacognitive awareness is notably higher than the 3.3% variance explained in achievement motivation in similar studies. This differential finding is theoretically significant—it suggests that ICT attitudes may be more closely aligned with metacognitive processes than with motivational constructs. Digital environments require metacognitive skills such as planning information searches, monitoring comprehension, and evaluating online resources (Greene et al., 2018). Students with positive ICT attitudes may be more inclined to engage in these metacognitive behaviors, creating a virtuous cycle of technology engagement and metacognitive development.

Implications for Educational Practice

These findings have several important implications for educational practice. First, the moderate relationship between ICT attitudes and metacognitive awareness suggests that fostering positive attitudes toward technology may contribute to metacognitive development. Schools should therefore invest not only in technology infrastructure but also in creating positive technology experiences that encourage students to view ICT as a tool for learning rather than mere entertainment (Greene et al., 2018).

Second, given that 89.5% of variance in metacognitive awareness remains unexplained, educators should adopt comprehensive approaches to metacognitive development. Effective strategies include explicit instruction in metacognitive strategies (Veenman et al., 2006), modeling of self-regulatory behaviors (Zimmerman, 2002), providing opportunities for reflection (Schraw et al., 2006), and creating classroom environments that support autonomous learning (Perry et al., 2019).

Third, the uniform metacognitive awareness across demographic groups suggests that interventions can be standardized rather than requiring differentiated approaches for various student populations. However, this uniformity should not mask potential differences in access to metacognitive-supportive learning environments. Schools should ensure that all students, regardless of background, receive instruction and support for metacognitive development.

Fourth, the finding that ICT attitudes explain more variance in metacognitive awareness than typically found for motivational outcomes suggests that technology integration initiatives may be particularly effective when designed to promote self-regulated learning. Digital tools that incorporate metacognitive supports—such as prompts for planning, self-monitoring checklists, and reflection questions—may be especially beneficial (Azevedo & Aleven, 2013).

Delimitations of the Study

Several limitations warrant consideration. First, the sample was limited to Chennai district, restricting generalizability to other regions. Second, self-report measures may be subject to social desirability bias and may not fully capture actual metacognitive processes (Paulhus & Vazire, 2007). Third, the cross-sectional design precludes causal inferences about the direction of relationship between ICT attitudes and metacognitive awareness. Fourth, the focus on higher secondary students limits applicability to other educational levels. Fifth, the study did not examine specific types of ICT use (e.g., entertainment vs. educational) which may differentially relate to metacognitive awareness.

Recommendations for Future Research

Future research should employ longitudinal designs to examine causal relationships and developmental trajectories of metacognitive awareness in relation to technology attitudes. Experimental studies investigating specific ICT interventions designed to promote metacognition could identify effective strategies. Qualitative research exploring how students actually employ metacognitive strategies in digital environments could provide deeper understanding of the mechanisms linking ICT attitudes and metacognition (Creswell & Poth, 2018). Studies across diverse geographical regions and educational contexts would enhance generalizability. Finally, examination of mediating variables (e.g., digital literacy, self-efficacy, parental mediation) and moderating variables (e.g., teaching methods, curriculum design) could clarify the conditions under which ICT attitudes influence metacognitive awareness.

Conclusion

This study demonstrates a significant moderate positive relationship between attitude towards ICT and metacognitive awareness among higher secondary students in Chennai. The regression model indicates that ICT attitudes explain 10.5% of variance in metacognitive awareness, suggesting that positive technology attitudes contribute meaningfully to students' capacity to reflect upon and regulate their learning. The absence of demographic differences across gender, medium, stream, class, family type, and school management indicates uniform attitudes and metacognitive awareness across student populations. These findings have important implications for educational practice, suggesting that technology integration efforts should be designed to explicitly promote metacognitive development. As education continues its digital transformation, understanding the complex interplay between technology attitudes and metacognitive awareness remains essential for preparing students to become self-regulated lifelong learners in the digital age.

References

- Anthony, B., Kamaludin, A., Romli, A., Raffei, A. F. M., Phon, D. N. A. L. E., Abdullah, A., & Ming, G. L. (2019). Exploring the role of blended learning for teaching and learning effectiveness in institutions of higher learning: An empirical investigation. *Education and Information Technologies*, 24(6), 3433-3466. <https://doi.org/10.1007/s10639-019-09941-z>
- Azevedo, R., & Aleven, V. (Eds.). (2013). *International handbook of metacognition and learning technologies*. Springer. <https://doi.org/10.1007/978-1-4419-5546-3>
- Balcikanli, C. (2011). Metacognitive Awareness Inventory for Teachers (MAIT). *Electronic Journal of Research in Educational Psychology*, 9(3), 1309-1332. <https://doi.org/10.25115/ejrep.v9i25.1620>
- Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education*, 27, 1-13. <https://doi.org/10.1016/j.iheduc.2015.04.007>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Sage Publications.
- Efklides, A. (2008). Metacognition: Defining its facets and levels of functioning in relation to self-regulation and co-regulation. *European Psychologist*, 13(4), 277-287. <https://doi.org/10.1027/1016-9040.13.4.277>
- Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist*, 34(10), 906-911. <https://doi.org/10.1037/0003-066X.34.10.906>
- Government of India. (2020). *National Education Policy 2020*. Ministry of Human Resource Development. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf
- Greene, J. A., Copeland, D. Z., Deekens, V. M., & Yu, S. B. (2018). Beyond knowledge: Examining digital literacy's role in the acquisition of understanding in science. *Computers & Education*, 117, 141-159. <https://doi.org/10.1016/j.compedu.2017.10.003>

- International Society for Technology in Education. (2022). *ISTE standards for students*. ISTE. <https://www.iste.org/standards/iste-standards-for-students>
- Kerlinger, F. N. (1986). *Foundations of behavioral research* (3rd ed.). Holt, Rinehart and Winston.
- Martinez, J. A. G., Abeledo, E. J. F., & Machado, E. R. (2021). Development and validation of the Attitude towards ICT Scale. *Revista de Psicodidáctica*, 26(1), 45-53. <https://doi.org/10.1016/j.psicod.2020.11.002>
- Paulhus, D. L., & Vazire, S. (2007). The self-report method. In R. W. Robins, R. C. Fraley, & R. F. Krueger (Eds.), *Handbook of research methods in personality psychology* (pp. 224-239). Guilford Press.
- Perry, N. E., Hutchinson, L. R., & Thauberger, C. (2019). Talking about teaching self-regulated learning: Scaffolding student teachers' development and use of practices that promote self-regulated learning. *International Journal of Educational Research*, 47(2), 97-108. <https://doi.org/10.1016/j.ijer.2008.11.010>
- Pino-Pasternak, D., & Whitebread, D. (2010). The role of parenting in children's self-regulated learning. *Educational Research Review*, 5(3), 220-242. <https://doi.org/10.1016/j.edurev.2010.07.001>
- Schneider, W. (2008). The development of metacognitive knowledge in children and adolescents: Major trends and implications for education. *Mind, Brain, and Education*, 2(3), 114-121. <https://doi.org/10.1111/j.1751-228X.2008.00041.x>
- Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology*, 19(4), 460-475. <https://doi.org/10.1006/ceps.1994.1033>
- Schraw, G., Crippen, K. J., & Hartley, K. (2006). Promoting self-regulation in science education: Metacognition as part of a broader perspective on learning. *Research in Science Education*, 36(1), 111-139. <https://doi.org/10.1007/s11165-005-3917-8>
- UNESCO. (2021). *ICT in education: A curriculum for schools and programme of teacher development*. United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/ark:/48223/pf0000378956>

- Veenman, M. V., Van Hout-Wolters, B. H., & Afflerbach, P. (2006). Metacognition and learning: Conceptual and methodological considerations. *Metacognition and Learning*, 1(1), 3-14. <https://doi.org/10.1007/s11409-006-6893-0>
- Voyer, D., & Voyer, S. D. (2014). Gender differences in scholastic achievement: A meta-analysis. *Psychological Bulletin*, 140(4), 1174-1204. <https://doi.org/10.1037/a0036620>
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64-70. https://doi.org/10.1207/s15430421tip4102_2
- Zimmerman, B. J., & Martinez-Pons, M. (1990). Student differences in self-regulated learning: Relating grade, sex, and giftedness to self-efficacy and strategy use. *Journal of Educational Psychology*, 82(1), 51-59. <https://doi.org/10.1037/0022-0663.82.1.51>

Research Article

Career Maturity of Higher Secondary Students in Relation to their Parental Support

Dr. T. Sivasakthi Rajammal

Assistant Professor & Head, Department of Educational Psychology,

Tamil Nadu Teachers Education University, Chennai, TN, India.

ORCID: <https://orcid.org/0009-0008-7108-5095>

DOI: <https://doi.org/10.34293/0974-2123.v19n1.002>

Abstract

The ability to make well-informed, practical, and suitable job decisions that take into account cognitive, emotional, and psychological aspects is known as career maturity. Higher levels are associated with greater job satisfaction, effective employment, and better job crafting. It entails self-evaluation, career planning, and comprehension of occupational information. Higher secondary students frequently have poor professional maturity, which indicates a need for better career counseling to assist them in making realistic, well-informed job decisions. It entails being prepared to handle responsibilities related to professional growth, integrating cognitive abilities and attitudes regarding job selection. For higher secondary students (classes XI–XII), parental support is essential for academic achievement, self-worth, and stress management; these factors frequently result in improved grades, increased self-esteem, and fewer behavioral problems. Active participation through emotional support, upholding high standards for education, keeping an eye on study habits, and offering materials for competitive tests are all components of effective support. Hence, the study "Career Maturity of Higher Secondary Students in Relation to Their Parental Support" is significant and need-based. The investigator selected the 1050 samples from various higher secondary schools of Tamil Nadu by using stratified random sampling technique. The statistical techniques used in this study were percentage analysis, descriptive analysis, differential analysis and correlational analysis. The findings of the study would be very helpful to enhance the academic achievement of higher secondary students and benefit the target research population.

Keywords: Career Maturity, Higher Secondary Students, Parental Support, Academic Achievement, Education, Job Selection

Introduction

Career maturity among higher secondary students refers to a person's preparedness to make informed, age-appropriate, and realistic choices regarding their careers. It demonstrates the cognitive and emotional skills necessary to effectively handle vocational development tasks, including career exploration, planning, and choosing a profession that matches personal strengths and preferences. Parental support for higher secondary students (usually classes XI–XII) refers to the active engagement, nurturing actions, and supply of resources by parents to improve their child's academic success, emotional health, and social skills. It includes academic assistance, financial support, emotional backing, and consistent interaction with school staff.

Review of Literature

Das (2023) investigated the career maturity of higher secondary school students in relation to their academic achievement in Mayurbhanj district, Odessa, using survey method. Out of the 24 government-aided higher secondary schools in Mayurbhanj district, four schools were randomly selected, and from them 120 students (60 males and 60 females) were selected as study samples using random sampling method. The mean, standard deviation, t-test and Karl Pearson's correlation techniques were used to analysis the relationship between career maturity and academic achievement. A major finding of this study was that the students with high academic achievement differed significantly from those with low academic achievers in career maturity.

Jacy et al. (2023) Impact of career development intervention module on gender, income level and academic achievement in Saudi Arabia. This study aimed to investigate the impact of implementation of the career maturity intervention module among the students according to the variables of gender and financial income with the dependent variables of career maturity, career indecision, and career decision-making self-efficacy, through MANOVA (multivariate analysis of variance). There were no statistically significant differences in the effect of the career development intervention on career maturity, career indecision, and career decision-making self-efficacy among high school students based on

gender or family financial income. This could be as a result of the way people in Kingdom of Saudi Arabia live without any daily life necessities.

Chen and Mok (2023) examined how students' perceptions of parental academic involvement and goal orientations related to their academic buoyancy and adaptability in mathematics learning. A sample of 1,164 Chinese junior high school students participated in the study. The results obtained using structural equation modelling indicated that after controlling for family socioeconomic status and gender, perceived parental involvement positively affected the students' academic buoyancy and adaptability. Furthermore, parental involvement was significantly associated with students' mastery and performance-approach goal orientations, which further partially mediated the relationship between parental involvement and academic buoyancy and adaptability.

Lemessa et al. (2023) attempted to explore parents' involvement in education activities to improve their children's academic achievement. A sample of 292 households was selected from 5th to 8th grade students in four schools. Descriptive analysis showed that 19% of the respondents were not actively involved in giving advice, guiding, and counselling their children at home. 67% of the respondents showed medium parental involvement in helping their children, while 14% of respondents showed good parental involvement in education at home. Similarly, the study revealed that 53% of the respondents were not participating in school activities at all, 35% were medium participation, and 13% were well involved in school activities.

Need and Significance of the Study

Examining the career maturity of higher secondary students in connection with parental support is essential since, during this crucial and stressful period, students frequently have uncertain career aspirations and encounter growing indecisiveness. Parental engagement acts as a vital, immediate factor in alleviating this uncertainty. Studies show that although parental support might not directly enhance career decisiveness, it serves as a safeguard against anxiety, lowering career indecision in students. In a fast-evolving world, adolescents need support to match their abilities with career opportunities to avoid future stress and discontent. The demanding atmosphere of higher secondary education necessitates robust support systems for students, with parents being a key and influential part. Research indicates that elements such as being in a rural or urban area and the degree of parental engagement

greatly affect a student's preparedness for their future profession. This research assists in determining the most effective ways for parents to aid students' career development during this transition, reducing the chances of career uncertainty and negative academic results. Hence, the investigator felt willing to do this study.

Objectives of the Study

1. To find out the level of career maturity of higher secondary students.
2. To find out the level of parental support of higher secondary students.
3. To find whether there is any significant difference in career maturity and parental support of higher secondary students with respect to their type of school, father's education, mother's education, and family income.
4. To find whether there is any significant relationship between career maturity and parental support of higher secondary students.

Hypothesis of the Study

1. There is any significant difference in career maturity and parental support of higher secondary students with respect to their type of school, father's education, mother's education, and family income.
2. There is any significant relationship between career maturity and parental support of higher secondary students.

Methodology

The investigator opted to choose the survey method for the study. A stratified random sampling technique was adopted for selecting a sample from the population. Taking into account the strata type of school, father's education, mother's education, and family income, the investigator selected the 1,050 samples from various higher secondary schools in the districts of Tamil Nadu. The investigator utilized the standardized tool, the Career Maturity Inventory, which was developed by John O. Crites and Mark L. Savickas (2011), and the Parental Support Questionnaire was developed and standardized by the investigator and research supervisor in 2022. The investigator applied important statistical techniques to analyze the research data.

Testing of Objectives and Hypothesis

Objective 1: To find out the level of career maturity of higher secondary students.

Table 1: Level of career maturity of higher secondary students

S.No	Variable	Low		Moderate		High	
		N	%	N	%	N	%
1	Career Maturity	167	15.90	621	59.14	262	24.95

It is inferred from the above table that 15.90% of higher secondary students have low, 59.14% of them have moderate and 24.95% of them have high level of career maturity. It is observed from the above results that the majority of the Higher Secondary students in the study area had a moderate level in Career Maturity.

Objective 2: To find out the level of parental support of higher secondary students.

Table 2: Level of parental support of higher secondary students

S.No	Variable	Low		Moderate		High	
		N	%	N	%	N	%
1	Parental Support	137	13.05	642	61.14	271	25.81

It is inferred from the above table that 13.05% of higher secondary students have low, 61.14% of them have moderate and 25.81% of them have high level of parental support. It is observed from the above results that the majority of the higher secondary students in the study area had a moderate level in parental support.

Hypothesis 1: There is any significant difference in career maturity and parental support of higher secondary students with respect to their type of school, father's education, mother's education, and family income.

Table 3: Difference among boys', girls' and co-education school higher secondary students in their career maturity and parental support

S.No.	Variables	Source of variation	Sum of squares	df	Mean square	Calculated 'F' value	Remarks
1.	Career Maturity	Between	745.753	2	372.876	20.77	S
		Within	24176.324	1047	17.948		
2.	Parental Support	Between	6991.384	2	3495.692	15.45	S
		Within	304651.431	1047	226.170		

It is inferred from the above table that the calculated 'F' value (20.77, 15.45) is greater than the table value at 0.01 level of significance. Hence the respective framed hypothesis is accepted. Thus, the result shows that there is significant difference among boys', girls' and co-education schools' higher secondary students in Career Maturity and Parental Support.

Table 4: Difference among illiterate, school education, and college education of fathers in relation to career maturity and parental support of higher secondary students

S.No.	Variables	Source of variation	Sum of squares	df	Mean square	Calculated 'F' value	Remarks
1.	Career Maturity	Between	144.677	2	72.339	31.61	S
		Within	3080.189	1047	2.287		
2.	Parental Support	Between	127.273	2	63.636	20.47	S
		Within	4185.969	1047	3.108		

It is inferred from the above table that the calculated 'F' value (31.61, 20.47) is greater than the table value (6.64) at 0.01 level of significance. Hence the respective framed hypothesis is accepted. Thus, the result shows that there is significant difference among illiterate, school education, and college education of fathers in relation to career maturity and parental support of higher secondary students.

Table 5: Difference among illiterate, school education, and college education of mothers in relation to career maturity and parental support of higher secondary students

S.No.	Variables	Source of variation	Sum of squares	df	Mean square	Calculated 'F' value	Remarks
1.	Career Maturity	Between	338.984	2	169.492	57.44	S
		Within	3974.257	1047	2.950		
2.	Parental Support	Between	178.994	2	89.497	45.64	S
		Within	2640.979	1047	1.961		

It is inferred from the above table that the calculated 'F' value (57.44, 45.64) is greater than the table value (6.64) at 0.01 level of significance. Hence the respective framed hypothesis is accepted. Thus, the result shows that there is significant difference among illiterate, school education, and college education of mothers in relation to career maturity and parental support of higher secondary students.

Table 6: Difference exists among higher secondary students belonging to families with monthly incomes below Rs. 25,000, between Rs. 25,000 and Rs. 50,000, and above Rs. 50,000 in terms of their career maturity and parental support

S. No.	Variables	Source of variation	Sum of squares	df	Mean square	Calculated 'F' value	Remarks
1.	Career Maturity	Between	33.832	2	16.916	6.72	S
		Within	3388.242	1047	2.515		
2.	Parental Support	Between	202.164	2	101.082	45.04	S
		Within	3022.702	1047	2.244		

It is inferred from the above table that the calculated 'F' value (6.72,45.04) is greater than the table value (6.64) at 0.01 level of significance. Hence the respective framed hypothesis is accepted. Thus, the result shows that there is significant difference among higher secondary students belonging to families with monthly incomes below Rs. 25,000,

between Rs. 25,000 and Rs. 50,000, and above Rs. 50,000 in terms of their career maturity and parental support.

Hypothesis 2: There is any significant relationship between career maturity and parental support of higher secondary students.

Table 7: Table showing the significant relationship between career maturity and parental support

S.No	Variables	Correlation Coefficient	Significance
1	Career maturity and parental support	0.090	0.01 Significance

From the above table, it is inferred that the value of correlation between career maturity and parental support (0.090) are higher than the table value 0.081, to be significant at 0.01 level of significance. The correlation between these variables is positive and significant. Therefore, it is found that there is a significant and positive relationship between career maturity and parental support. Hence, the formulated hypothesis is accepted.

Educational Implication

Based on the findings, the investigator suggests the following educational implications:

1. Every parent should support higher secondary students in making the right career decisions after completing Class XII.
2. The educational administration should organize career awareness programs at the end of higher secondary education.
3. Class mentors should guide higher secondary students based on their interests and explain the pros and cons of different career options.
4. Higher secondary students should take responsibility for choosing their careers after carefully analysing the opportunities available in society.
5. In every school, counsellors should play a major role in guiding higher secondary students in their career decisions.

Recommendation

Based on the findings, the investigator makes the following recommendations:

1. Special awareness-cum-motivation programmes should be organized in schools to

enhance the career maturity of female higher secondary students.

2. Orientation programmes on career maturity should be arranged for English medium higher secondary students to further improve their career maturity.
3. Focused efforts should be undertaken to improve the overall conditions of rural schools.
4. Intensive measures, including increased financial allocation, should be taken to improve the school climate in Tamil medium schools.
5. Counselling and guidance programmes should be organized to create a healthy and positive environment and to promote co-education at the higher secondary level.

Suggestion

1. Future studies may explore the role of digital literacy and technological skills in enhancing career maturity and employability among higher education students.
2. Comparative research can be conducted across different streams (Arts, Science, and Professional courses) to examine variations in career aspirations and preparedness.
3. Longitudinal studies may be undertaken to understand the long-term impact of parental support and school climate on students' academic and career success.
4. Further research can investigate the effectiveness of institutional interventions such as career guidance programmes, counselling, and skill development initiatives in improving employability.
5. Studies may focus on identifying specific socio-economic and psychological barriers faced by underprivileged and slow learners in achieving career success and suggest targeted support strategies.

Conclusion

The study concludes that parental support plays a significant role in enhancing the career maturity of higher secondary students. Students who receive proper guidance, encouragement, and career-related information from their parents tend to exhibit higher levels of career maturity, enabling them to make informed and effective career decisions.

References

- Abdinoor. (2020). Socio-economic status, career decision-making self-efficacy, career maturity and gender with secondary school students in Northern Kenya. *International Journal of Multidisciplinary and Current Educational Research*, 2(4), 160-164.
- Assefa, A., & Sintayehu (2019). Relationship between parental involvement and Student's academic achievement in model primary and secondary school and secondary of Haramaya University, East Hararghe Zone, Oromia regional state, Ethiopia. *International Journal of Education and Literacy studies*, 7(2), 46-56. <https://journals.aiac.org.au/index.php/IJELS/article/view/5351/3929>
- Chen, M., & Mok, I. A. (2023). Perceived parental involvement influences students' academic buoyancy and adaptability: The mediating roles of goal orientations. *Frontiers in Psychology*, 14: 1248602. 1-11. <https://doi.org/10.3389/fpsyg.2023.1248602>
- Das, S. (2023). An analysis of career maturity of higher secondary school students in relation to their academic achievement in Mayurbhanj district, Odisha. *International Journal of Scientific Development and Research*, 8(2), 649-655. <https://mail.ijedr.org/papers/IJEDR2302115.pdf>
- Debta, P. K. & Patra, K. (2022). Career choice and career management process of higher secondary science students: A systematic review of literature. *YMER*, 21(11), 588-661. <https://ymerdigital.com/uploads/YMER211172.pdf>
- Jacy, A. S. D., Jaafar, W. M. W., Ismail, A., & Yusop, Y. M. (2023). Impact of career development intervention module on gender, income level and academic achievement in Saudi Arabia, *Journal of Positive Psychology and Wellbeing*, 7(2), 600-615. <https://www.journalppw.com/index.php/jppw/article/view/16164/10316>
- Lemessa, R., Senbeto, T., Alemayehu, E., & Gemechu, N. (2023). Family involvements in education and quality of education: Some selected 2nd cycle public schools in west shoa zone, Ethiopia. *Cogent Education*, 10(1), 1-13. <https://doi.10.1080/2331186X.2023.2197669>

Correlation between Social Engagement (Being a Social Butterfly) and Emotional Wellbeing of Student-Teachers

Jennifer.M¹ & Dr.A.H.Komala²

¹ Research Scholar

² Assistant Professor of Economics -Education

N.K.T. National College of Education for Women, Chennai, TN, India.

DOI: <https://doi.org/10.34293/0974-2123.v19n1.003>

Abstract

The study entitled “*Correlation between Social Engagement (being a Social Butterfly) and Emotional Wellbeing of Student-Teachers*” investigates how the social engagement patterns of student-teachers relate to their emotional stability, positive affect and overall wellbeing. This Study examines the relationship between social butterfly characterised as being enthusiastic, interpersonal interaction and comfort in group communication and emotional wellbeing among student-teachers. Emotionally strong person is able to handle stress effectively and they remain calm, composed and balanced even in difficult situations. Such individuals bounce back quickly from challenges and continue moving forward with confidence. A sample of 300 student-teachers were selected through simple random sampling from Teacher-Education Institutions. Social Engagement (Social butterfly) tool (2025) is a self-constructed tool by the investigator with five-point Likert scale. Emotional Wellbeing tool (2025) is a self-constructed tool by the investigator with five point Likert scale. Statistical analyses include correlation and independent t-tests based on gender and family type. Results revealed a positive correlation between social engagement (being a social butterfly) and emotional wellbeing, indicating that higher levels of sociability strongly relate to better emotional functioning. Findings indicated significant difference based on gender and family type. The findings of the study have important educational implications for teacher education programmes. Since a positive relationship was found between social engagement (being a social butterfly) and emotional wellbeing, it is essential for institutions to create learning environments that encourage active social interaction, group communication and

collaborative learning. Activities such as group discussions, peer teaching, seminars and cooperative projects can help student-teachers develop interpersonal skills and enhance their emotional stability.

Keywords: Social Engagement, Social Butterfly, Emotional Wellbeing, Student-Teachers

Introduction

The process of becoming an effective teacher extends beyond acquiring pedagogical skills; it encompasses social adaptability, emotional maturity and the development of professional identity. Teacher-Educator continually navigate dynamic interpersonal environments that require empathy, communication and collaboration. Individuals who display a high degree of sociability often referred to as “social butterflies” thrive in such interactive settings because they exhibit openness, enthusiasm and comfort in engaging with peers and mentors.

Human beings are inherently social this forms the basis of socialisation, through which norms, behaviours and emotional patterns are learned. Early experiences within families and schools shape social identity and interpersonal competence, which later influence adult roles such as teacher, parent, team member, leader etc. Socialisation in Teacher-Education Programmes cultivates teamwork, communication and emotional intelligence that support both academic success and relational harmony.

A social butterfly student-teacher acts as a facilitator of positive peer engagement and collaborative learning. Their interactions reinforce emotional support networks, essential for navigating academic and practicum-related challenges. Emotional wellbeing, defined as the ability to manage emotions, maintain resilience and experience life satisfaction, plays an essential role in teachers’ professional efficacy. In Teacher-Education contexts, emotional wellbeing strengthens classroom management, teacher–student relationships and pedagogical decision-making.

Background of the Study

Teacher Education is a socially constructed space where student-teachers continuously interact, observe and learn professional norms. Their social experiences

influence emotional development, coping strategies and their ability to maintain psychological balance. Being a Social butterfly is characterised as being expressiveness, friendly and active social involvement further gets beneficial from expanded peer networks and stronger emotional support. These qualities enhance learning, collaboration and practical teaching performance.

Emotional wellbeing is closely linked to mental health, emotional intelligence and social connectedness. Student-teachers with high emotional wellbeing experience greater life satisfaction, motivation and resilience qualities essential for effective teaching. Daily classroom encounters evoke complex emotional responses, requiring student-teachers to regulate both positive and negative emotions. Prosocial behaviour, emerging from healthy emotional development, further enhances collaboration and contributes to positive academic climates.

In teacher-education settings, social behaviour and emotional wellbeing operate as interdependent constructs. Emotional Intelligence Theory explains how social awareness and empathy reinforce emotional stability. Social Learning Theory highlights how observational learning and interpersonal experiences shape professional identity. Thus, Student-Teacher with adequate knowledge tend to contribute positive professional and thereby to academic settings. Positive Psychology affirms that wellbeing is nurtured through relationships, engagement and meaningful accomplishment. Together, these frameworks reveal that being a social butterfly fosters emotional resilience, motivation and supportive interactions all crucial to student-teacher success.

This study, therefore, investigates how the traits associated with being a social butterfly relate to emotional wellbeing of student-teachers, addressing a vital component of teacher-development processes.

Review of Related Studies

The Patna Women's College module highlights that positive interactions during childhood foster confidence, communication skills and prosocial tendencies. The document underscored that social competence is reinforced during adolescence and higher education, shaping the individual's ability to collaborate and engage in professional communities.

Alluru and Suneela (2024) examined how emotional competence and teacher self-efficacy relate to the wellbeing of pre-service teachers. The results shows that individuals with higher emotional competence experience reduced stress, greater confidence in teaching tasks and better overall emotional wellbeing.

Guy-Evans (2023) presented a conceptual examination of the process of socialization patterns across life stages. Further the result shows that through repeated interactions within family, school and peer groups, individuals internalize social expectations that shape later social behaviour and emotional adjustment. The work emphasized that socialization is not a passive process but a dynamic exchange where individuals actively interpret social cues.

Gopal (2022) examined the influence of mental health on personal strengths and coping strategies among student-teachers. The findings suggest that those with strong mental health display healthier coping behaviours and greater resilience when dealing with academic stress.

Tintori et al. (2021) investigated how socialization influence children's prosocial behaviours such as helping, sharing and cooperation. Further their findings reveals that supportive family environments, emotional communication and exposure to positive role models significantly predicted higher prosocial tendencies. And the study also shows that strong early socialization experiences foster empathy and interpersonal responsiveness.

Jyoti (2020) investigated how emotional intelligence relates to teacher effectiveness and wellbeing among secondary school teachers. The study reveals that higher emotional intelligence has strong emotional stability, improved job performance and reduced stress.

Menaha (2019) examined the influence of self-reflection and mental health on the social commitment of B.Ed student-teachers. The findings reveals that higher self-reflection supports better emotional balance and prosocial attitudes. Improved mental health pave way to greater commitment with social responsibilities within educational institutions.

Parkash (2014) investigated wellbeing in relation to mental health, emotional intelligence and socio-economic status among teacher educators. Results shows that emotional intelligence significantly leads to psychological wellbeing, while lower mental health issues contributed to greater professional satisfaction.

Valkenburg and Peter (2011) analysed how globalization, digital communication and shifting family structures have altered contemporary socialization patterns. These findings revealed that children and young adults increasingly develop social behaviours through mediated environments such as online groups and community platforms. Further it can be observed that rapid change in social norms requires stronger adaptability and interpersonal skills.

Research Questions

- Is there a significant correlation between social engagement and emotional well-being among student-teachers?
- Do male and female student-teachers differ in their social engagement and emotional well-being?
- Are there significant differences in social engagement and emotional well-being among student-teachers based on their family type?

Need for the Study

Although extensive research exists on emotional intelligence, mental health and social competence, the relationship between being a social butterfly and emotional wellbeing among student-teachers remains underexplored. Existing studies investigate these constructs separately, but little attention has been given to how enthusiastic social engagement contributes to emotional stability within teacher-training contexts. With increasing emotional challenges and social isolation among students, understanding this link is essential for designing effective social-emotional interventions in teacher-education institutions.

Objectives of the Study

- To determine the relationship between social engagement (social butterfly) and emotional wellbeing of student-teachers.
- To compare the social engagement (social butterfly) and emotional wellbeing of student-teachers based on gender.
- To examine the difference in social engagement (social butterfly) and emotional wellbeing of student-teachers based on family type.

Hypotheses

1. There is a significant positive relationship between social engagement (social butterfly) and emotional wellbeing of student-teachers.
2. There is no significant difference in social engagement (social butterfly) and emotional wellbeing of student-teachers based on gender.
3. There is no significant difference in social engagement (social butterfly) and emotional wellbeing of student-teachers based on family type

Methodology

Nature of the Study

The study adopts a correlational research design to examine the relationship between being a social butterfly and emotional wellbeing among student-teachers.

Variables

- **Independent Variable:** Social Engagement (Social Butterfly Behaviour)
- **Dependent Variable:** Emotional Wellbeing

Population and Sample

The sample consists of **300 student-teachers** selected using simple random sampling technique.

Tools Used

Social Engagement (Social Butterfly Behaviour Scale) (Tool 1)

The Social Butterfly Behaviour Scale was developed to measure the level of sociability and interpersonal engagement among student-teachers. The scale consists of 25 positive statements that reflect behaviours associated with socially active individuals. The scale follows a five-point Likert type format ranging from *Strongly Disagree (1)* to *Strongly Agree (5)*. The total score is obtained by summing the responses to all items, with higher scores indicating a higher level of social butterfly behaviour.

Emotional Well-Being Scale (Tool 2)

The Emotional Wellbeing Scale was developed to assess the emotional functioning of student-teachers. The scale consists of 25 positive statements designed to measure key aspects of emotional wellbeing. The tool consists of 25 positive statements and follows a five-point Likert type scale with response options ranging from *Never (1)* to *Always (5)*. The total score is obtained by summing the responses to all items, where higher scores indicate a higher level of emotional wellbeing.

Cronbach's Alpha method was adopted to determine the reliability of the tools used to measure social engagement (being a social butterfly behaviour scale) had a coefficient value of 0.997 and emotional wellbeing had a value of 0.937 indicating both the tools to be reliable measures for assessing social engagement and emotional wellbeing of student-teachers

Statistical Techniques

Correlation and independent sample t-tests were used. Data were analysed using values provided in the statistical output.

Findings & Results

Relationship

Table 1: Showing correlation between social Engagement (being a social butterfly) and emotional wellbeing of student-teachers N=300

Variables	Social Engagement	Emotional Wellbeing
Social Engagement	1	0.778
Emotional Wellbeing	0.778	1

It could be inferred from the above table that there exists significant Positive relationship between social Engagement (being a social butterfly) and emotional wellbeing of student-teachers at 0.01 level. Indicating an improvement in social interaction tend to increase their ability to maintain emotional well-being.

Table 2: Showing significance mean difference in the social Engagement (being a social butterfly) and emotional wellbeing based on gender.

Variables	Gender	N	Mean	Std. Deviation	Std. Error Mean	t
Social Engagement	Female	125	87.952	14.745	1.3188	3.344
	Male	175	76.371	14.746	1.0693	
Emotional Wellbeing	Female	125	89.143	14.959	1.1308	8.98
	Male	175	78.376	15.001	1.4285	

It could be inferred from the mean value of social engagement that female student-teachers with mean value of 87.952 were found to have a better social engagement ability compared to male student-teacher. Similarly, with 89.143 mean value female student teachers were found to be better than male student teachers in emotional wellbeing aspects.

Table 3: Table 3: Showing significance mean difference in the social Engagement (being a social butterfly) and emotional wellbeing based on family type.

	Family	N	Mean	Std. Deviation	Std. Error Mean	T
Social Engagement	Nuclear	241	78.295	14.625	0.9421	6.776
	Joint	59	88.915	13.356	1.7388	
Emotional Wellbeing	Nuclear	241	69.224	15.772	1.016	5.415
	Joint	59	89.153	13.804	1.7971	

The Present study highlights that the mean value of 88.915 with social engagement of joint family student-teachers is higher than compared to the student-teachers from nuclear family. On analysing their emotional wellbeing aspects with their family type, it could be inferred that student-teacher from joint family type with the mean value of 89.153, tend to be emotionally stable compared to the student-teachers of nuclear family.

The significant variations observed across gender and family type further emphasize the influence of personal and social background factors on social behaviour and emotional health. The results underscore the importance of promoting healthy social interaction and emotional wellbeing within teacher education programmes to support the holistic development of future teachers

Educational Implications

Teacher-education institutions must foster social-emotional learning by encouraging collaborative activities, group discussions and mentorship networks that strengthen emotional resilience. Student-teachers with strong social engagement tend to adapt better, manage stress effectively and participate more actively in peer learning. Institutions should integrate wellbeing programs, counselling support and reflective practices to enhance emotional balance. Cultivating sociability and emotional wellbeing will contribute to improved teacher performance, healthier classroom environments and long-term professional success. The findings of the present study have important educational implications for teacher education and the holistic development of student-teachers. The significant positive relationship between being a social butterfly and emotional wellbeing indicates that social engagement plays a crucial role in enhancing emotional stability, optimism and psychological balance among future teachers. Since, teaching is an emotionally demanding and socially interactive profession, fostering healthy social behaviour during teacher preparation can contribute meaningfully to professional competence and personal wellbeing.

Teacher Education Institutions need to create learning environments that actively promote positive social interaction among student-teachers. Collaborative activities such as group discussion, peer learning and participatory classroom activities are more likely to develop confidence, interpersonal sensitivity and emotional resilience. Such socially enriched environments can reduce feelings of isolation, stress and emotional fatigue, thereby

supporting better emotional wellbeing. These findings suggest that structured social engagement within academic settings can serve as an effective means of nurturing emotionally healthy future teachers.

The observed differences based on gender and family type further suggest that social and emotional development is influenced by personal and contextual factors. Educational institutions should adopt inclusive and supportive practices that recognize individual differences among student-teachers. Providing equal opportunities for social participation, emotional expression and institutional support can help bridge disparities arising from background factors. A nurturing institutional climate can compensate for varied social exposures and contribute to emotional balance among all student-teachers.

From a pedagogical perspective, socially confident and emotionally well-balanced teachers are more likely to establish positive classroom relationships, communicate effectively and create inclusive learning environments. The findings imply that encouraging social engagement during teacher training can indirectly enhance teaching effectiveness and classroom management skills. Teachers who are emotionally healthy and socially responsive are better equipped to understand students' needs, collaborate with colleagues and adapt to contemporary educational contexts.

At an institutional level, the study underscores the need to foster a positive academic culture that values interaction, collaboration and emotional safety. Institutions that encourage open communication, teamwork and mutual support can enhance the overall wellbeing and professional readiness of student-teachers. Such environments not only improve academic outcomes but also contribute to long-term professional commitment and satisfaction in the teaching profession.

Overall, the findings emphasize that social behaviour and emotional wellbeing are interconnected dimensions that significantly influence the development of effective teachers. Recognizing and nurturing these dimensions within teacher education can contribute to the preparation of emotionally resilient, socially competent and professionally effective teachers who are capable of meeting the diverse challenges of contemporary education.

Conclusion

Sociability enhances emotional resources, strengthens coping abilities and contributes to professional identity formation. Emotional wellbeing, in turn, reinforces social engagement, forming a mutually supportive cycle essential for effective teaching. The results emphasise the importance of integrating social engagement and emotional wellbeing initiatives within teacher education programmes. Developing socially confident and emotionally balanced teachers will ultimately contribute to healthier classroom environments, improved teaching effectiveness, and better educational outcomes. As there exist a direct relationship between social engagement and emotional wellbeing, Educational Institutions and future teachers of this Nation must always consider in developing their social skills, communication skills and teamwork skills to make their own boundaries bigger so that their emotional stability, self-esteem and emotional resilient are build stronger which help to produce an inspiring Teacher which is the only have to have an aspiring student. In conclusion, the study demonstrates that sociability and emotional wellbeing are interconnected dimensions that significantly influence the professional and personal development of future teachers.

References

- Alluru, S., & Suneela, K. (2024). Emotional competence and teacher self-efficacy in relation to wellbeing among pre-service teachers. *Journal of Educational Research*, 18(1), 55–68.
- Ashok, K., Devi, R., & Thomas, A. (2020). Psychological wellbeing among school teachers using Ryff's model. *Indian Journal of Positive Psychology*, 11(2), 133–139.
- Bhagat, J. (2016). *Impact of emotional intelligence on teachers' effectiveness, mental health and job stress* (Doctoral dissertation, University of Jammu).
- Gopal, G. (2022). *Influence of mental health on coping strategies among student teachers* (Doctoral dissertation, Mahatma Gandhi University).
- Guy-Evans, O. (2023). *Socialization: Definition, process, and examples*. Simply Psychology. <https://www.simplypsychology.org/socialization.html>

- Holeyannavar, P., & Itagi, S. (2011). Emotional competence and stressors of female school teachers. *Indian Journal of Psychology*, 86(3), 245–252.
- Jyoti. (2020). *Teachers' effectiveness in relation to emotional intelligence and wellbeing* (Doctoral dissertation, Chaudhary Devi Lal University).
- Menaha, P. (2019). *Self-reflection, mental health and social commitment of B.Ed student-teachers* (Doctoral dissertation, Bharathiar University).
- Nataraj, S., & Manjula, M. (2022). Psychological wellbeing among Indian teachers. *Indian Journal of Psychological Research*, 39(2), 89–103.
- Parkash, O. M. (2014). *Wellbeing among teacher educators in relation to mental health and emotional intelligence* (Doctoral dissertation, Maharshi Dayanand University).
- Tintori, A., Vacca, R., & Cortesi, F. (2021). The impact of socialization on children's prosocial behaviour. *Frontiers in Psychology*, 12, 861797. <https://doi.org/10.3389/fpsyg.2021.861797>
- Valkenburg, P. M., & Peter, J. (2011). Online communication and adolescent well-being: Testing the stimulation versus the displacement hypothesis. *Journal of Computer-Mediated Communication*, 16(2), 200–209. <https://doi.org/10.1111/j.1083-6101.2010.01529.x>

Research Article

Examination Anxiety in Relation to Academic Achievement among Higher Secondary School Students

Dr. S. Arockia Elizabeth Josephine

Assistant Professor of Biology

Stella Matutina College of Education, Chennai, TN, India.

ORCID: <https://orcid.org/0009-0008-3371-1411>

DOI: <https://doi.org/10.34293/0974-2123.v19n1.004>

Abstract

Examination anxiety is a common psychological problem among students, especially at the higher secondary level. The present study aims to examine the relationship between examination anxiety and academic achievement among higher secondary school students. Data were collected from students using a standardized examination anxiety scale and academic scores. The findings reveal that examination anxiety has a significant impact on students' academic performance, often showing a negative correlation. The study highlights the need for proper guidance and counselling to reduce anxiety and improve academic outcomes.

Keywords: Examination anxiety, academic achievement, higher secondary school students, test anxiety, student performance, stress and anxiety

Introduction

Examination anxiety can have a significant impact on academic achievement. When a student experiences examination anxiety, they may experience a range of negative emotions such as fear, worry, and panic, which can interfere with their ability to perform well on exams and assessments.

Research has consistently shown that examination anxiety can lead to lower academic achievement. Students with high levels of examination anxiety tend to score lower on exams and have lower overall grades compared to their peers who experience lower levels of examination anxiety. This can limit opportunities for future academic or career success. Examination anxiety can also have broader impacts on academic achievement beyond exam

scores and grades. Students with high levels of examination anxiety may experience reduced motivation to learn, difficulty concentrating, and negative self-beliefs about their academic abilities. These factors can further undermine academic achievement, creating a cycle of poor performance and reduced self-confidence.

Fortunately, there are strategies that can help to reduce the negative impact of examination anxiety on academic achievement. These strategies may include cognitive-behavioral therapy, relaxation techniques, exam preparation, and access to support and resources. By learning to manage their examination anxiety and developing effective coping strategies, students can improve their academic performance and achieve greater success in their academic endeavors.

Review of Related Studies

Shaikh Soheel Jaleel, Dr.Ghoti R.M (2021) conducted a study on “ The influence of Emotional Intelligence on academic achievement. “The aim of this study was to investigate the influence of emotional intelligence on academic achievement among students of Education. The findings of the research reveals that the emotional intelligence is positively associated to the academic achievement of the students.

Peng and Rogier (2020) conducted a study on ‘The Development of Academic Achievement and Cognitive Abilities’: In this article, this study poses evidence from recent research on the bidirectional relations between academic achievement and cognitive abilities. The findings of the study suggest that (a) reading mathematics and cognitive abilities (i.e., working memory, reasoning, and executive function) predict each other in development, (b) direct academic instruction positively affects the development of reasoning, and (c) such bidirectional relations between cognitive abilities and academic achievement seem weaker among children with.

Jha et al. (2019) conducted a study on “The Relationship between Test Anxiety and Academic Performance among Undergraduate Medical Students: A Cross-sectional Study”. Findings of the study revealed that the text anxiety was significantly associated with academic performance.

Muwada Bashir Awad Bashir et al. (2019) investigated the prevalence of exam anxiety and depression among students for Sudan National Boarding Examination. Westside

Test Anxiety Scale and Patient's Health Questionnaire (PHQ9) was used on a cross-cultural sample. Depression and exam anxiety were found highly correlated. Gender, maternal level of education, previous exam experience and academic performance are significant predictors in exam anxiety status.

Mirawdali and Ball (2018) explored the effects of test anxiety on academic performance of students. Results of the study revealed that strategic studying, time management and academic competence are the key factors related with the anxiety associated with test; and academic performance of the students significantly influenced by their studying strategies, time management and academic competence.

Need for the Study

The predominant aim of this study is to understand the implication of examination anxiety that the students experience on their academic achievement. Examination anxiety is an inevitable factor which every individual experiences in life. Students falling under this age group strongly attach their emotion with the outcome of their result. Examination anxiety has become an integral part of the formal education system as the purpose of education has become very result oriented. Academic achievement is the measure of one's success rate which is documented. It determines the accomplishments on one's personal or institutions short - term and long term. Understanding the Effects of Examination anxiety, we can better understand the effects of stress on students' academic performance, as well as the mechanisms that underlie these effects. It can also help identify risk factors for poor academic performance, such as high levels of stress or low coping skills. The study of examination anxiety and academic achievement can also help educators and parents better support student success by providing insights into how to create a supportive learning environment and promote healthy coping strategies and can also contribute to our broader scientific understanding of the complex interplay between psychological factors and academic outcomes.

Objectives of the Study

- To determine the relationship between examination anxiety and academic achievement of higher secondary school students.

- To compare the examination anxiety and academic achievement of higher secondary school students based on gender.
- To analyze the difference in examination anxiety and academic achievement of higher secondary school students based on family type.

Hypotheses

- There is no significant relationship between examination anxiety and academic achievement among higher secondary school students.
- There is no significant difference in examination anxiety and academic achievement among higher secondary school students based on gender.
- There is no significant difference in examination anxiety and academic achievement among higher secondary school students based on type of school.

Methodology

Nature of the Study

The present study was planned as descriptive research. It aims to investigate the relationship between examination anxiety and academic achievement among higher secondary school students.

Variables

- **Independent Variable:** Academic Achievement
- **Dependent Variable:** Examination Anxiety

Population and Sample

The sample consists of **300 student-teachers** selected using simple random sampling technique.

Tools Used

The investigator utilized the standardized tool, the Examination Anxiety tool, which was devised by Mandler and Sarason in 1952 and the students of 9th standard to 12th standard II term examination marks were obtained by the students in all the subjects were taken to be the achievement scores in academic achievement. The investigator applied

important statistical techniques to analyze the research data.

Statistical Techniques

Correlation analysis and independent sample t-tests were employed for data analysis. The collected data were interpreted using the values obtained from the statistical output.

Findings and Results

Table 1: showing the correlation in examination anxiety and academic achievement of higher secondary school students

Variable	N	r
Examination Anxiety and Academic Achievement	308	0.019

Form the Table 1 it can be observed that the correlation coefficient between Examination Anxiety and Academic Achievement is 0.019. This indicates a very weak positive relationship between the two variables.

Table 2 showing the differences in examination anxiety and academic achievement among higher secondary school students based on gender.

Variables	Category	Sample Size	Mean	Standard Deviation	't' value	'df'	Level of Significance
Examination Anxiety	Male	209	51.69	11.522	1.445	306	0.149
	Female	99	53.75	11.994			
Academic Achievement	Male	209	2.19	0.678	3.818	306	0.000
	Female	99	1.86	0.756			

It could be inferred from the mean value of Examination Anxiety that Female students with a mean value of 53.75 were found to have slightly higher Examination Anxiety than Male students with a mean value of 51.69, though the difference was not found to be statistically significant. Whereas, with a mean value of 2.19, Male students were found to have higher Academic Achievement than Female students with a mean value of 1.86, and the difference was found to be statistically significant at the 0.01 level.

Table 3 showing the difference in examination anxiety and academic achievement among higher secondary school students based on type of school.

Variables	Category	Sample Size	Mean	Standard Deviation	't' value	'df'	Level of Significance
Examination Anxiety	Co-Ed	209	51.32	12.512	2.261	306	0.024
	Boys	99	54.53	9.446			
Academic Achievement	Co-Ed	209	2.13	0.701	1.879	306	0.061
	Boys	99	1.97	0.749			

It could be inferred from the mean value of Examination Anxiety that students studying in Boys' Schools with a mean value of 54.53 were found to have a higher level of Examination Anxiety compared to students studying in Co-Educational Schools with a mean value of 51.32. Whereas, with a mean value of 2.13, students studying in Co-Educational Schools were found to have slightly better Academic Achievement than students studying in Boys' Schools with a mean value of 1.97, though the difference was not found to be statistically significant.

Educational Implications of the Study

Education is most important for all. Education plays a very important role in everyone's life. Education is that what transforms a person to live a better life and even in social well-being. Education is the one that do something constructive in near future it helps a person to show their best by their mind and spirit. Education plays a vital role in success or the personal growth. For determining what is good or what is bad for student education will helps. A person who gets good education will become good citizen. more dependable worker. Without education a person is incomplete, so education makes a person a critical thinker to handle all kinds of situations.

Examination anxiety, also known as test anxiety, is a psychological phenomenon characterized by excessive worry, nervousness, and fear of failure related to an upcoming exam or assessment. It is a form of performance anxiety that can affect people of all ages and levels of education, from primary school students to professionals taking certification exams.

The concept of examination anxiety is rooted in the idea that individuals perceive exams as a high-stakes situation, with consequences such as academic or professional success or failure, social judgment, and personal validation. These perceived stakes can trigger a range of physical, emotional, and cognitive symptoms, including sweating, trembling, racing heart, negative thoughts, and self-doubt.

Examination anxiety can have negative impacts on academic and professional performance, mental health, and overall well-being. However, there are strategies that can be used to manage and overcome examination anxiety, including relaxation techniques, cognitive-behavioral therapy, and adequate preparation. Understanding the meaning and concept of examination anxiety can help individuals recognize and address their own symptoms and challenges related to exam stress.

Conclusion

The purpose of the present investigation was to study examination anxiety in relation to academic achievement with reference to some personal variables. The effects of examination anxiety on academic achievement are complex and can vary from person to person. However, in general high level of examination anxiety can have a negative impact on academic performance. This analysis may enrich the investigators in the field of education and the findings of the study may serve as database for future research.

References

- Boonk, L., Gijssels, H. J. M., Ritzen, H., & Brand-Gruwel, S. (2018). A review of the relationship between parental involvement indicators and academic achievement. *Educational Research Review*, 24, 10–30.
- Ghamari, M., Alizadeh, S., & Mojarad, A. (2018). Effectiveness of cognitive-behavioral intervention in reducing students' test anxiety. *Journal of Educational Psychology Studies*, 15(29), 75–92.
- Haley Jafari, et al. (2019). Relationship between study habits and academic achievement in students of medical sciences in Iran. *Advances in Medical Education and Practice*, 10, 637–643.

- Jha, K., et al. (2019). The relationship between test anxiety and academic performance among undergraduate medical students: A cross-sectional study. *International Journal of Community Medicine and Public Health*, 6(9), 3854–3859.
- Joseph, R. (2017). Academic achievement of secondary school students in relation to achievement motivation, study habits and learning styles in Mysore, Karnataka. *International Journal of Advanced Educational Research*, 2(5), 45–49.
- Karshki, H., et al. (2017). A model for test anxiety based on attribution style and achievement goals. *Journal of Educational Sciences*, 24(3), 115–128.
- Kubilay, Y. (2017). Relationship between learning style, test anxiety and academic achievement among social studies pre-service teachers. *Universal Journal of Educational Research*, 5(11), 1930–1940.
- Kumar, L. (2021). Relationship between examination anxiety and academic achievement of higher secondary students. *International Journal of Creative Research Thoughts*, 9(6), 445–450.
- Kumari, A. (2020). Examination anxiety and academic achievement among secondary school students. *International Journal of Research and Analytical Reviews*, 7(2), 310–315.
- Lara, L., & Saracostti, M. (2019). Effect of parental involvement on children's academic achievement in Chile. *Frontiers in Psychology*, 10, 1464.
- Manchanda, S., et al. (2018). A study on measuring examination anxiety in school children. *International Journal of Physiology, Nutrition and Physical Education*, 3(1), 1465–1468.
- Mirawdali, S., & Ball, S. (2018). Effects of test anxiety on academic performance of students. *International Journal of Social Sciences & Educational Studies*, 5(2), 33–39.
- Mocklinghoff, S., et al. (2023). Achievement goals, test anxiety, and academic achievement: A structural equation modeling approach. *Learning and Individual Differences*, 101, 102245.
- Nagel, T. (2017). Academic achievement and persistence in online self-paced courses. *Online Learning Journal*, 21(2), 61–74.

- Ogochukwu Okobia, D., & Ossai Oji, J. (2021). Test anxiety and academic achievement among undergraduate students in College of Education, Agbor, Nigeria. *International Journal of Evaluation and Research in Education*, 10(3), 1001–1008.
- Okezie, N. E. (2017). Influence of examination anxiety on academic achievement of secondary school students in Owerri municipal council of Imo State. *International Journal of Innovative Research and Development*, 6(7), 145–150.
- Peng, P., & Kievit, R. A. (2020). The development of academic achievement and cognitive abilities: A bidirectional perspective. *Child Development Perspectives*, 14(1), 15–20.
- Shaikh Soheel Jaleel, & Ghoti, R. M. (2021). Influence of emotional intelligence on academic achievement. *International Journal of Research in Education*, 10(2), 55–60.
- Sebastian, K., et al. (2023). Roles of test anxiety safety behaviors and memory confidence in test performance. *Journal of American College Health*, 71(4), 1120–1128.

Research Article

Digital Pedagogical Skills, Self-Efficacy, and Teaching Effectiveness among Pre-Service Teachers: A Structural Equation Modeling Approach

Dr. P. Subramanian

Assistant professor,

Department of Educational Planning and Administration,
Tamil Nadu Teachers Education University, Chennai, TN, India.

ORCID: <https://orcid.org/0000-0001-5586-6299>

DOI: <https://doi.org/10.34293/0974-2123.v19n1.005>

Abstract

The increasing integration of digital technologies in education has made digital pedagogical skills a fundamental competency for teachers. This study examines the influence of digital pedagogical skills on teaching effectiveness among pre-service teachers, incorporating digital self-efficacy as a mediating variable. A quantitative research design using Structural Equation Modeling (SEM) was employed. Data were collected from 250 pre-service teachers through validated instruments. The findings revealed that digital pedagogical skills significantly predict teaching effectiveness ($\beta = 0.52$, $p < 0.001$) and also influence self-efficacy ($\beta = 0.60$, $p < 0.001$), which in turn affects teaching effectiveness ($\beta = 0.41$, $p < 0.001$). The model demonstrated a good fit (CFI = 0.94, RMSEA = 0.05). The study highlights the importance of integrating digital pedagogy into teacher education programs and provides implications for curriculum design and policy development.

Keywords: Digital Pedagogy, Teaching Effectiveness, Pre-Service Teachers, Self-Efficacy, SEM, Teacher Education

Introduction

The digital transformation of education has fundamentally reshaped teaching and learning processes across the globe. The integration of digital technologies such as learning management systems, virtual classrooms, artificial intelligence tools, and multimedia resources has redefined how knowledge is delivered and acquired. In contemporary educational settings, teachers are no longer mere transmitters of knowledge but facilitators of

interactive and technology-supported learning environments. As a result, the demand for digital pedagogical skills has increased significantly. Digital pedagogical skills refer to the ability of teachers to effectively integrate digital technologies into teaching practices in a way that enhances student engagement, understanding, and learning outcomes. These skills extend beyond basic technical knowledge and include the capacity to design digital content, manage online classrooms, assess learners using digital tools, and adapt instructional strategies to technology-enhanced environments. Frameworks such as Technological Pedagogical Content Knowledge (TPACK) emphasize the integration of technology, pedagogy, and content as essential for effective teaching in the digital age. Pre-service teachers, who are in the process of professional preparation, play a crucial role in shaping the future of education. They must be equipped with digital competencies to meet the evolving demands of modern classrooms. However, evidence suggests that many teacher education programs continue to rely heavily on traditional pedagogical approaches, providing limited exposure to digital teaching practices. This gap often results in pre-service teachers entering the profession with inadequate confidence and competence in using digital tools. Teaching effectiveness, which includes dimensions such as instructional clarity, student engagement, classroom interaction, and learning outcomes, is increasingly influenced by teachers' ability to integrate technology. Digital tools have the potential to create more interactive, personalized, and learner-centered environments. However, the effective use of these tools depends largely on teachers' skills and confidence. In this context, digital self-efficacy defined as an individual's belief in their ability to use digital technologies effectively emerges as a critical factor. Teachers with higher self-efficacy are more likely to adopt innovative teaching strategies and persist in overcoming technological challenges. Therefore, this study aims to examine the influence of digital pedagogical skills on teaching effectiveness, with particular emphasis on the mediating role of digital self-efficacy among pre-service teachers.

Review of Literature

The concept of digital competence has gained significant attention in teacher education, particularly through the Technological Pedagogical Content Knowledge (TPACK) framework. Mishra and Koehler (2021) emphasized that integrating technology with pedagogy enhances instructional quality and supports student-centered learning. Supporting this, Tondeur et al. (2020) and Instefjord and Munthe (2021) found that structured digital training improves pre-service teachers' competence, confidence, and readiness for technology

integration. Teachers' beliefs and attitudes also influence technology use. Ertmer and Ottenbreit-Leftwich (2020) reported that pedagogical beliefs and self-confidence determine the effective adoption of digital tools. In this context, Bandura (2020) highlighted that self-efficacy influences behavior and performance, while Scherer et al. (2021) confirmed that digital self-efficacy mediates the relationship between digital competence and teaching effectiveness. Further studies indicate that digital pedagogical skills enhance student engagement and learning outcomes. Falloon (2020) and Voogt et al. (2022) found that effective use of digital tools promotes interactive and student-centered learning environments. However, Kumar and Singh (2023) and Zhang (2024) noted that pre-service teachers often possess only moderate digital competence due to limited training opportunities. Additionally, Redecker (2021) emphasized through the DigCompEdu framework that competencies such as digital resource creation and assessment are essential for modern educators. More recently, Li (2025) found that higher digital competence and self-efficacy lead to improved teaching performance. Overall, the literature confirms a strong relationship between digital pedagogical skills, self-efficacy, and teaching effectiveness, highlighting the need for further empirical studies using advanced methods such as Structural Equation Modeling.

Research Gap

Despite the growing body of research on digital competence and technology integration in education, several important gaps remain. First, many studies focus on in-service teachers, while comparatively fewer investigations examine pre-service teachers, who are still in the formative stage of developing their professional competencies. These limits understanding of how digital pedagogical skills are cultivated during teacher education. Second, prior research has largely examined digital pedagogical skills, self-efficacy, and teaching effectiveness as separate constructs. Limited studies have explored the combined and interrelated effects of these variables, particularly the mediating role of digital self-efficacy in explaining how digital skills translate into effective teaching practices. Third, most existing studies rely on basic statistical techniques such as correlation and regression. There is a lack of research employing advanced analytical approaches like Structural Equation Modeling (SEM), which can simultaneously examine direct and indirect relationships among variables and provide a more comprehensive model. Finally, there is insufficient empirical evidence from developing contexts, where challenges such as limited infrastructure, access to digital resources, and inadequate training may influence the

development of digital pedagogical skills and teaching effectiveness. Therefore, the present study seeks to address these gaps by examining the relationship between digital pedagogical skills and teaching effectiveness, incorporating digital self-efficacy as a mediating variable, and applying a robust SEM approach among pre-service teachers.

Objectives

- To assess the level of digital pedagogical skills among pre-service teachers is moderate
- To determine the level of teaching effectiveness among pre-service teachers is moderate
- To examine the level of self-efficacy among pre-service teachers is moderate
- To examine the influence of digital pedagogical skills on self-efficacy and teaching effectiveness among pre-service teachers
- To examine the mediating role of self-efficacy in the relationship between digital pedagogical skills and teaching effectiveness using SEM

Hypotheses

- The level of digital pedagogical skills among pre-service teachers is moderate.
- The level of teaching effectiveness among pre-service teachers is moderate.
- The level of self-efficacy among pre-service teachers is moderate.
- There is no the influence of digital pedagogical skills on self-efficacy and teaching effectiveness among pre-service teachers

Methodology

The present study employed the survey method within a quantitative research framework to investigate the relationships among digital pedagogical skills, self-efficacy, and teaching effectiveness among pre-service teachers. The sample comprised 250 pre-service teachers drawn from teacher education institutions, selected through a simple random sampling technique to ensure representativeness and reduce sampling bias. Data were collected using a structured questionnaire consisting of three standardized scales measuring digital pedagogical skills (12 items), teaching effectiveness (12 items), and self-efficacy (10 items). The reliability of the instruments was established using Cronbach's alpha coefficients, which yielded values of 0.89 for digital pedagogical skills, 0.91 for teaching effectiveness, and 0.87 for self-efficacy, indicating high internal consistency. The validity of the tools was ensured through content validation by subject experts, while construct validity was confirmed using Confirmatory Factor Analysis (CFA). For data analysis, both descriptive and inferential statistical techniques were employed. Percentage analysis was used to determine the levels of

the variables, while regression analysis was conducted to examine the influence of digital pedagogical skills on self-efficacy and teaching effectiveness. Furthermore, Structural Equation Modeling (SEM) was applied to test the hypothesized relationships and to analyze both direct and indirect effects among the variables, providing a comprehensive understanding of the proposed model.

Data Analysis and Interpretation

Ho:1 Level of Digital Pedagogical Skills

Table 1: Level of Digital Pedagogical Skills

Level	Frequency	Percentage
Low	40	16%
Moderate	150	60%
High	60	24%

Interpretation

The table shows that the majority of pre-service teachers (60%) possess a moderate level of digital pedagogical skills, while 24% exhibit a high level and 16% fall under the low category. This indicates that although pre-service teachers have a basic understanding of digital pedagogy, there is significant scope for improvement through structured training.

Ho:2 Level of Teaching Effectiveness

Table 2: Level of Teaching Effectiveness

Level	Frequency	Percentage
Low	35	14%
Moderate	155	62%
High	60	24%

Interpretation

The findings reveal that most respondents (62%) demonstrate a moderate level of teaching effectiveness. Only a small proportion (14%) fall in the low category, indicating that teaching performance is generally satisfactory but not optimal.

Ho:3 Level of Self-Efficacy**Table 3: Level of Self-Efficacy**

Level	Frequency	Percentage
Low	35	14%
Moderate	155	62%
High	60	24%

Interpretation

The majority of pre-service teachers (62%) exhibit a moderate level of self-efficacy, suggesting average confidence in using digital tools and handling instructional challenges.

Regression Analysis

Ho:4 There is no the influence of digital pedagogical skills on self-efficacy and teaching effectiveness among pre-service teachers

Table 5 Regression Analysis

Predictor	Dependent Variable	Beta	Sig.
DPS	TE	0.52	0.000
DPS	SE	0.60	0.000
SE	TE	0.41	0.000

Interpretation

The regression analysis reveals that digital pedagogical skills significantly influence both teaching effectiveness ($\beta = 0.52$) and self-efficacy ($\beta = 0.60$). Additionally, self-efficacy significantly predicts teaching effectiveness ($\beta = 0.41$). Since all p-values are less than 0.001, the relationships are statistically significant.

ANOVA**Table 6: ANOVA Results**

Source	F-value	Sig.
Regression	85.32	0.000

Interpretation

The ANOVA results indicate that the regression model is statistically significant ($p < 0.001$), confirming that digital pedagogical skills are a strong predictor of teaching effectiveness.

SEM Analysis

Table 7: Model Fit Summary

Fit Index	Value	Recommended
CFI	0.94	> 0.90
TLI	0.92	> 0.90
RMSEA	0.05	< 0.08

Structural Equation Model

Table 8: Structural Model Results

Path	Beta	p-value	Result
DPS → TE	0.52	0.000	Significant
DPS → SE	0.60	0.000	Significant
SE → TE	0.41	0.000	Significant

Interpretation

The SEM results indicate that digital pedagogical skills have both direct and indirect effects on teaching effectiveness. The significant path from DPS to SE shows that digital skills enhance self-efficacy, while the path from SE to TE confirms that higher confidence leads to better teaching performance. Thus, self-efficacy acts as a mediator, meaning that digital pedagogical skills improve teaching effectiveness both directly and indirectly through self-efficacy.

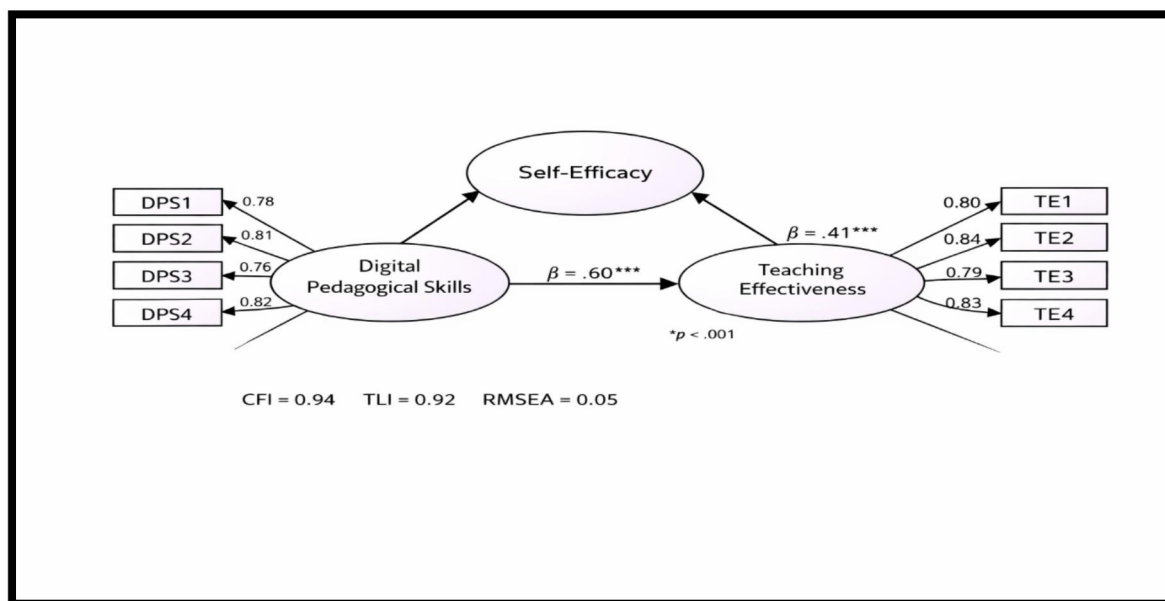


Table 9: Model Fit

Index	Value	Interpretation
CFI	0.94	Good fit
TLI	0.92	Good fit
RMSEA	0.05	Excellent fit

The model fit indices indicate that the proposed Structural Equation Model demonstrates a good fit to the observed data. The Comparative Fit Index (CFI) value of 0.94 and the Tucker-Lewis Index (TLI) value of 0.92 both exceed the recommended threshold of 0.90, suggesting that the model adequately explains the covariance among the variables. Additionally, the Root Mean Square Error of Approximation (RMSEA) value of 0.05 is well below the acceptable limit of 0.08, indicating an excellent fit of the model. Overall, these indices confirm that the hypothesized model is statistically sound and provides a reliable representation of the relationships among digital pedagogical skills, self-efficacy, and teaching effectiveness among pre-service teachers.

Findings of the study

The study revealed several significant findings regarding digital pedagogical skills, self-efficacy, and teaching effectiveness among pre-service teachers:

Moderate Level of Digital Pedagogical Skills

The majority of pre-service teachers (60%) possess a moderate level of digital pedagogical skills, indicating a basic but not advanced ability to integrate technology into teaching.

Moderate Level of Teaching Effectiveness

About 62% of respondents demonstrated a moderate level of teaching effectiveness, suggesting that while teaching practices are satisfactory, there is room for enhancement.

Moderate Level of Self-Efficacy

A significant proportion (62%) of pre-service teachers showed moderate self-efficacy, reflecting average confidence in using digital tools and managing instructional tasks.

Significant Influence of Digital Pedagogical Skills

Digital pedagogical skills significantly influence:

- Teaching effectiveness ($\beta = 0.52$, $p < 0.001$)
- Self-efficacy ($\beta = 0.60$, $p < 0.001$)

Role of Self-Efficacy in Teaching Effectiveness

Self-efficacy significantly affects teaching effectiveness ($\beta = 0.41, p < 0.001$).

Mediating Role of Self-Efficacy

Structural Equation Modeling confirmed that self-efficacy partially mediates the relationship between digital pedagogical skills and teaching effectiveness.

Model Fitness

The SEM model demonstrated good fit indices ($CFI = 0.94, RMSEA = 0.05$), confirming the validity of the proposed model.

Discussion

The findings highlight the growing importance of digital pedagogical skills in modern teacher education. The moderate levels observed across all three variables suggest that pre-service teachers are in a transitional phase, where they possess foundational competencies but lack advanced digital integration skills. The significant impact of digital pedagogical skills on teaching effectiveness aligns with prior research emphasizing the importance of integrating technology with pedagogy. Teachers who are proficient in digital tools can create more engaging, interactive, and student-centered learning environments. The strong relationship between digital pedagogical skills and self-efficacy supports Bandura's theory, which posits that confidence in one's abilities enhances performance. Pre-service teachers with higher digital competence tend to feel more confident, which in turn improves their teaching effectiveness. Furthermore, the mediating role of self-efficacy suggests that digital skills alone are not sufficient; psychological readiness and confidence play a crucial role in translating skills into effective teaching practices. This finding reinforces the need for teacher education programs to focus not only on skill development but also on building confidence and positive attitudes toward technology use. The moderate level of digital pedagogical skills among pre-service teachers indicates the need to revise teacher education curricula. Institutions should move beyond theoretical instruction and incorporate hands-on training in digital tools, such as Learning Management Systems (LMS), virtual classrooms, and AI-based educational applications. This will ensure that pre-service teachers develop practical competence in integrating technology into teaching. The study highlights the significant role of self-efficacy in enhancing teaching effectiveness. Therefore, teacher education programs should focus on building confidence alongside skill development. This can be achieved through micro-teaching sessions, simulation-based learning, peer

collaboration, and guided practice, which allow students to experience success in using digital tools. Digital pedagogical skills directly influence teaching effectiveness, there is a need to promote technology-integrated pedagogical approaches such as blended learning, flipped classrooms, and interactive multimedia instruction. These approaches can help pre-service teachers create more engaging, student-centered learning environments. The findings emphasize the importance of continuous assessment and feedback in developing digital competence. Teacher educators should use formative assessment techniques, reflective practices, and digital portfolios to monitor and support the growth of pre-service teachers. Institutions should strengthen infrastructure and access to digital resources. Availability of smart classrooms, reliable internet connectivity, and updated software tools is essential for effective training and practice. Finally, the study suggests the importance of professional readiness for the digital age. Teacher education programs should align with global competency frameworks such as TPACK and DigCompEdu to ensure that future teachers are equipped with the necessary skills, knowledge, and attitudes to function effectively in technology-rich classrooms. Overall, these implications stress the need for a holistic and practice-oriented approach in teacher education, where digital skills, pedagogical knowledge, and self-efficacy are developed simultaneously to enhance teaching effectiveness.

Conclusion

The study concludes that digital pedagogical skills play a crucial role in enhancing teaching effectiveness among pre-service teachers. While the overall levels of digital skills, self-efficacy, and teaching effectiveness are moderate, the significant relationships among these variables indicate strong potential for improvement. Self-efficacy emerges as a key mediating factor, demonstrating that confidence in using digital technologies is essential for effective teaching. Therefore, teacher education programs must adopt a holistic approach that combines skill development with psychological empowerment. By strengthening digital competencies and self-efficacy, future educators can be better prepared to meet the demands of 21st-century classrooms and contribute to improved educational outcomes.

References

- Bandura, A. (2020). Self-efficacy: The exercise of control. W.H. Freeman.
- Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2020). Teacher technology change: How knowledge, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 52(3), 255–284.

- Falloon, G. (2020). From digital literacy to digital competence: The teacher digital competency framework. *Educational Technology Research and Development*, 68(5), 2449–2465.
- Instefjord, E. J., & Munthe, E. (2021). Educating digitally competent teachers: A study of integration of professional digital competence in teacher education. *Teaching and Teacher Education*, 67, 37–45.
- Kumar, R., & Singh, P. (2023). Digital competence among pre-service teachers: Challenges and opportunities. *International Journal of Educational Research*, 115, 102041.
- Li, X. (2025). Digital competence and teaching performance: The mediating role of self-efficacy. *Computers & Education*, 190, 104610.
- Mishra, P., & Koehler, M. J. (2021). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054.
- Redecker, C. (2021). European framework for the digital competence of educators: DigCompEdu. European Commission.
- Scherer, R., Siddiq, F., & Tondeur, J. (2021). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach. *Computers & Education*, 128, 13–35.
- Tondeur, J., Scherer, R., Siddiq, F., & Baran, E. (2020). Enhancing pre-service teachers' technological pedagogical content knowledge. *Educational Technology Research and Development*, 68(3), 1451–1471.
- Voogt, J., Fisser, P., Pareja Roblin, N., Tondeur, J., & van Braak, J. (2022). Technological pedagogical content knowledge: A review of the literature. *Journal of Computer Assisted Learning*, 29(2), 109–121.
- Zhang, Y. (2024). Digital readiness of pre-service teachers in developing countries. *Education and Information Technologies*, 29(1), 567–584.

Conceptual Article

Artificial Intelligence and the Illusion of Learning: Rethinking Knowledge Formation in Contemporary Education

Ebin Christopher Harris

University of St. Thomas, Houston, Texas, USA

DOI: <https://doi.org/10.34293/0974-2123.v19n1.006>

Abstract

The rapid integration of Artificial Intelligence (AI) into educational contexts has transformed teaching and learning by enhancing efficiency, personalization and access to information. However, these developments raise fundamental concerns regarding the nature and quality of learning itself. This article examines the phenomenon of the illusion of learning, wherein students demonstrate performance without corresponding understanding. Drawing on constructivist theory, cognitive psychology and recent research on AI in education, the study analyzes cognitive offloading, the erosion of student agency, the illusion of fluency and the displacement of effortful learning. At the same time, it acknowledges the pedagogical opportunities AI offers when used critically. The article concludes by proposing a disciplined critical integration of AI that preserves intellectual engagement, provokes intellectual curiosity, supports the teacher's professional judgment and sustains the formative aims of education.

Keywords: Artificial intelligence, cognitive offloading, student agency, effortful learning, educational psychology

Introduction

The growing presence of Artificial Intelligence (AI) in the educational environment marks a profound shift in the conditions under which learning occurs. AI systems now generate explanations, compose essays and solve complex problems with speed and precision that was unimaginable to earlier generations. These developments promise increased efficiency, accessibility and personalization. Yet they also raise a deeper pedagogical and psychological question, namely whether the processes through which genuine learning occurs are being gradually weakened.

Educational psychology has consistently affirmed that learning is not merely the acquisition of information but active construction of knowledge through personal engagement, reflection and cognitive effort. Piaget (1952) emphasizes that knowledge emerges through interaction with cognitive challenges, while Vygotskij (1978) explains that learning takes place within a socially mediated process. Dewey (2013) further argues that thinking is a disciplined response to uncertainty and difficulty. These perspectives converge on a central insight that learning requires effortful engagement on the part of the learner.

AI introduces a tension within this framework. By providing an immediate and often complete response, it reduces the necessity of engaging the cognitive processes that produce understanding. Students may demonstrate performance without comprehension, giving rise to what may be described as the illusion of learning. This article examines this phenomenon through the lens of cognitive psychology and recent empirical research, while also considering the opportunities AI presents when used with pedagogical discipline.

Cognitive Offloading and the Disruption of Learning Processes

The integration of AI intensifies cognitive offloading, defined as delegation of mental processing to external systems. While such delegation can enhance efficiency, it also alters the cognitive conditions necessary for learning. Research in educational psychology demonstrates that durable learning depends on processes such as retrieval practices, elaboration and problem solving, which strengthen memory and understanding (Bjork, R.A & Bjork, E., 2019). When these processes are bypassed, knowledge remains shallow and easily forgotten.

Empirical studies support this concern. Fisher et al. (2015) show that access to external information inflates an individual's perception of their own knowledge without improving actual understanding. Ward et al. (2017) further demonstrate that the presence of digital devices reduces cognitive capacity, suggesting that external tools reshape internal cognition. In AI-supported environments these effects are magnified, as learners increasingly offload memory and retention to external systems and become dependent on them for retrieval, a process that may hinder efficient information processing. While Jose et al. (2025) and Favero et al. (2026) both indicate that AI-supported learning can increase efficiency while weakening active cognitive engagement, retention and higher-order thinking when learnings become overly dependent on generated outputs. Qadir & Mumtaz (2026) argue that

AI supported learning may improve immediate performance while degrading independent judgment and skill formation when reliance becomes excessive.

From a psychological perspective, this trend undermines the principle of desirable difficulties, which holds that learning is strengthened when it involves effortful processing (Bjork, R.A & Bjork, E.L, 2019). Hasan (2025) deepens this argument by showing that AI disrupts the effort-reward cycle that underpins intrinsic motivation. When learners are no longer required to struggle with content, they lose both the cognitive benefits of efforts and the motivational satisfaction that accompanies mastery. Th

us, cognitive offloading through AI is not merely a shift in tools but a transformation in the nature of learning itself.

Student Agency, Self-Regulation and Cognitive Development

Student agency is central to meaningful learning. It fosters the development of independent thought, self-regulation and critical judgment. Educational psychology emphasizes that learners must actively engage in monitoring and directing their own learning processes. This aligns with theories of self-regulated learning, where learners plan, evaluate and adjust their cognitive strategies.

AI alters this dynamic by shifting the locus of cognition from the learner to the system. Empirical evidence suggests that students increasingly rely on AI-generated response without engaging in critical evaluation. Recent studies indicate that such reliance can reduce opportunities for active recall and independent problem-solving, both of which are essential for deeper learning (Jose et al., 2025). Similarly, research shows that AI-supported environments may foster dependency when learners substitute engagement with immediate output, thereby weakening reflective thinking, and intellectual autonomy (Favero et al., 2026). This growing reliance on external systems raises concerns about erosion of evaluative judgement and the diminishing capacity for independent reasoning in learners.

Hasan (2025) introduces the concept of cognitive outsourcing to describe this phenomenon, arguing that repeated reliance on AI can diminish learners' confidence in their own intellectual abilities. From a psychological standpoint this weakens self-efficacy, an important and key factor in motivation and persistence. When learners no longer see themselves as capable thinkers their engagement declines.

This has significant implications for education. Learning is not only about acquiring knowledge but also about forming the capacity to think. When AI replaces rather

than supports cognitive engagement, it risks producing learners who are efficient but not intellectually independent.

Fluency, Cognitive Load, and the Illusion of Learning

A defining feature of AI-generated content is its fluency, characterized by coherence, clarity and immediate availability. However, such fluency can create an illusion of learning. Research indicates that in the case of processing this often leads individuals to overestimate their level of learning, mistaking familiarity for mastery (Fisher et al., 2015). This tendency becomes particularly problematic in AI-mediated environments, where responses are presented in polished form without requiring visible cognitive effort from the learner.

From the perspective of cognitive load theory, learning depends on the careful balance between mental effort and processing capacity. While AI reduces cognitive load by providing ready-made answers, it may simultaneously eliminate the productive struggle necessary for meaningful learning. Carr (2010) argues that digital environments encourage shallow processing, reducing sustained attention and reflective engagement. When learners are not required to wrestle with ideas, the processes that support durable learning are weakened.

Hasan (2025) further demonstrates that AI disrupts the iterative process of drafting, revising and reflecting that are central to learning. In the absence of these processes, learners may achieve surface level performance without engaging in the deeper cognitive activity required for knowledge formation. Empirical evidence likewise suggests a decline in persistence and cognitive engagement in AI-supported environments, as learners increasingly offload effort and substitute sustained intellectual activity with automated outputs (Jose et al., 2025) (Favero et al., 2026). In this sense, AI does not merely assist learning but reshapes the conditions under which learning occurs.

At the same time, it is necessary to acknowledge that AI also presents significant opportunities for education. AI can provide personalized feedback, support adaptive learning pathways, and expand access to educational resources across diverse contexts. When designed to complement rather than replace cognitive engagement, AI has the potential to enhance learning outcomes and support individualized instruction (Favero et al., 2026)(Jose et al., 2025). It can also assist teachers in managing workload and identifying learning gaps, thereby strengthening instructional effectiveness.

However, these opportunities are inseparable from corresponding challenges. Uncritical reliance on AI risks reducing cognitive engagement, weakening student agency and fostering superficial forms of learning. The central issue is therefore not whether AI should be used but how it should be integrated into educational practices in a way that preserves the integrity of learning.

The National Educational policy (Government of India, 2020) emphasizes holistic development, critical thinking and ethical reasoning as core aims of education. These aims require active participation, reflection and intellectual effort, none of which can be achieved through passive reliance on technological systems. Hasan (2025) therefore argues that AI must complement rather than replace human effort. AI generates content, but authentic learning depends on human engagement and reflection. This calls for a pedagogical approach that sustains intellectual rigor while responsibly incorporating technological tools in the service of authentic learning.

Conclusion

Artificial Intelligence presents both promise and perils for education. While it enhances efficiency and access, it also introduces the risk of an illusion of learning, where performance replaces understanding. This article has argued that uncritical reliance on AI contributes to cognitive offloading, diminishes student agency, and reduces engagement in effortful learning, thereby weakening the very processes through which meaningful learning occurs.

Education must remain oriented toward the formation of learning, judgement and intellectual virtue. Psychological principles such as desirable difficulties, retrieval practices, and intrinsic motivation remind us that learning requires effort. AI can support this process; it cannot replace it. The responsibility of educators is to ensure that technological tools serve the deeper purposes of education rather than undermining them.

References

- Bjork, R. A, & Bjork, E. L (2019). Making things hard on yourself, but in a good way: Creating desirable difficulties to enhance learning. In M. A. Gernsbacher & J. Pomerantz (Eds.), *Psychology and the real world: Essays illustrating fundamental contributions to society* (2nd.ed. pp.56-64). Worth Publishers.

- Carr, N. (2010). *The shallows: What the Internet is doing to our brains* (1. ed). W. W. Norton & Company.
- Dewey, J. (1910)/2013. *How we think*. Dover Publications. Dover Publications.
- Favero, L., Pérez-Ortiz, J. A., Käser, T., & Oliver, N. (2026). *AI in Education Beyond Learning Outcomes: Cognition, Agency, Emotion, and Ethics* (arXiv:2602.04598). arXiv. <https://doi.org/10.48550/arXiv.2602.04598>
- Fisher, M., Goddu, M. K., & Keil, F. C. (2015). Searching for explanations: How the Internet inflates estimates of internal knowledge. *Journal of Experimental Psychology: General*, 144(3), 674–687. <https://doi.org/10.1037/xge0000070>
- Government of India. (2020). *National Education Policy 2020*. Ministry of Human Resource Development.
- Hasan, M. K., (2025). How AI quietly undermines the joy and effort of learning: A call for rebalancing education in the digital age. *Annals of Medicine & Surgery*, 87(8), 4693–4694. <https://doi.org/10.1097/MS9.00000000000003456>
- Jose, B., Cherian, J., Verghis, A. M., Varghise, S. M., Mumthas, S., & Joseph, S. (2025). The cognitive paradox of AI in education: Between enhancement and erosion. *Frontiers in Psychology*, 16, 1550621. <https://doi.org/10.3389/fpsyg.2025.1550621>
- Piaget, J., (1952). *The origins of intelligence in children*. International Universities Press.
- Qadir, J., & Mumtaz, M. (2026). *The Psychology of Learning from Machines: Anthropomorphic AI and the Paradox of Automation in Education* (Version 2). arXiv. <https://doi.org/10.48550/ARXIV.2601.06172>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard Univ. Press.
- Ward, A. F., Duke, K., Gneezy, A., & Bos, M. W. (2017). Brain Drain: The Mere Presence of One's Own Smartphone Reduces Available Cognitive Capacity. *Journal of the Association for Consumer Research*, 2(2), 140–154. <https://doi.org/10.1086/691462>

Conceptual Article

Using Digital Tools in Education

Dr. V. Sheeja Vayola

Assistant Professor

Stella Matutina College of Education, Chennai, TN, India.

ORCID: <https://orcid.org/0009-0004-7806-348X>

DOI: <https://doi.org/10.34293/0974-2123.v19n1.007>

Abstract

Transition, Transformation and Revolution is the scenario of today's educational system. All process of learning soon crossing boundaries and barriers. The younger generation today is not interested in age-old techniques; rather they are desirous of something more stimulating and challenging to the mundane system seen in classroom's today. Youngsters today, require a change in knowledge, competencies and skills to deal with the technological advancement. Integrated computer technology in today's world is both a challenge and an opportunity. These technology tools are very much needed for academic, administrative research and extension function.

keywords: Educational Transformation, Digital Learning, Technology Integration, Innovative Teaching Methods, ICT in Education, Smart Classrooms, E-learning, Skill Enhancement

Introduction

The traditional approach of lecture and note taking has lost its effectiveness as the modern day around education grows. In efforts to grow academically it must be considered that differentiated modalities of teaching and learning are necessary to implement deeper levels of growth and conceptual development. Since every student is not interested in all subject matters. However, it is the responsibility of the education system to employ a variety of opportunities for the students to gain interests, orchestrating academic growth and progression throughout childhood and adolescence. ICT has turned from being a technology of communication and information to a curriculum creation and delivery system for teachers and learners.

The use of Educational technology can bring a huge change in education. Internet and e-learning devices can make class room environment extremely amazing. Teaching through

computer, internet and multimedia devices will be a common thing in future. Now a day's different multimedia lessons are available. By using these multimedia lessons teachers may teach the students very easily.

Meaning of Digital Tools

We are running into the 21st century where technology knows no bounds. This is the phase of radical development where technology is taking over every niche and corner. Smartphones, laptops, and tablets are no more unknown words. During this phase the education system is evolving for the sake of betterment, as this generation's students are not born to be confined by the limits of simple learning; their curiosity is vast and cannot be catered with educational systems that were designed earlier. If we kept on teaching our children the way we taught them yesterday, we would deprive them of their tomorrow. Our old educational system lacks the capability to stand a chance in the 21st century. So, we are compelled to use digitization in our educational system.

Main Types of Learning in Education Using Digital Tools

Today teachers use electronic medium for the teaching - learning process in the classroom. It is the order of the day that every teacher should use all kinds of educational technologies in their teaching strategy.

Electronic Learning (e-Learning)

Electronic learning is a general term used to refer computer enhanced learning. It is commonly associated with field of Advance Learning Technology (ALT), which deals with both the technologies and associated methodologies in learning using networked technologies. It is also known as online learning. However, e-learning involves more than just the presentation and delivery of the materials using the web; the learner and the learning process should be the focus of e-learning.

E-learning has the following advantages:

- ❖ Eliminating time and geographical barriers in education for learners as well as teachers.
- ❖ Enhanced group collaboration made possible via ICT.
- ❖ New educational approaches can be used.
- ❖ It can provide speedy dissemination of education to target disadvantaged groups.

- ❖ It offers the combination of education while balancing family and work life.
- ❖ It enhances the international dimension of educational services.

Ubiquitous Learning (U-Learning)

Ubiquitous Learning means “everywhere learning” or learning content follows people around. Core “knowledge pots” hold content and information. Various devices plug in and retrieve the information in the appropriate formats like cell phone, laptop or other technology gadgets. It fulfills e-learning’s promise of “anytime, anywhere, and any context”. Ubiquitous Learning (U-Learning) emerged through the concept of ubiquitous computers in education, the introduction of e-learning and mobile learning epitomized the constant transformations that were occurring in education (Muthuchamy, Thiyaagu, 2010)

Virtual Learning

Virtual Learning refers to all learning activities that occur in noncontiguous educational settings where the learners and their teachers are separated temporally and spatially (Anandan, Nallu Samy, 2013). A virtual learning environment is a phrase that refers to technology which supports teaching and learning; it involves collaboration, communication and content tools, as well as providing students with an online personal learning space. Virtual learning environment does not decrease the importance of the classroom or the teacher; it enhances the learning and teaching experience. The virtual learning environment, if used effectively, changes the entire teaching and learning experience by making learning very invigorating, vibrant and real. Virtual learning environment support is dedicated to improving and enhancing the teaching and learning experience not only for the student but for the teacher as well.

Blended Learning

Blended Learning is a face-to-face classroom instruction with online learning. A major part of the activities take place online, while traditional classroom time is reduced but not eliminated. Blended learning sometimes, also called “Hybrid learning”, provides the best opportunities for learning transition from classroom to e-learning.

Blended Learning is the combination of multiple approaches to learning. It is usually used to define a situation where different delivery methods are combined together to deliver a

particular course. These methods may include a mixture of face-to-face learning, self-paced learning and online classrooms.

- **Face to face learning:** It refers to learning that occurs in a traditional classroom setting where a faculty member delivers instruction to a group of learners. This could include lectures, workshops, presentation, tutoring, conference and much more.
- **Self-paced learning:** It provides the flexibility to learn according to the availability of learners' own time and pace. It occurs in a variety of ways such as: reading specific chapters from text book, studying course material presented through web-based or CD based course, attending pre-recorded classes or sessions, reading articles referred by faculty member, working on assignments and projects, and searching and browsing the internet.

Major advantages of blended learning

There are a number of advantages to blended learning. Some of these are ease of access, pedagogical effectiveness, reduction in drop-out rate and course interaction. Students today are non-traditional, attempting to balance jobs, and university life. Blended learning is one way which Institutions of Higher Education are looking for ways to reach and retain these students.

- The time the students spend on Campus would be spent in more effective Learning.
- Increases student engagement, Retention and offers opportunities for more authentic Learning.
- Seamless integration of the learning without depending on borders and physical limits.
- Active Learning rather than passivity in the Classroom.
- Allows for more interaction with the students if they receive the 'lecture' portion outside of the face to face classroom.
- Better opportunity for students to learn in a Collaborative environment and makes better use of student time.

Blog

The term web-blog refers to a simple webpage consisting of brief paragraphs of opinions, information, personal diary entries, or links, called posts, arranged chronologically

with the most recent first, in the style of an online journal. The education Blog can be a powerful and effective technology tool for teaching and learning process.

Blog (a blend of the term Web log) is a type of website or part of a website. Blogs are usually maintained by an individual with regular entries of commentary, descriptions of events, or other material such as graphics or video. Most blogs are interactive, allowing visitors to leave comments and it is this interactivity that distinguishes them from other static websites. Many blogs provide commentary or news on a particular subject; others function as more personal online diaries. A typical blog combines text, images, and links to other blogs, Web pages, and other media related to its topic. The ability of readers to leave comments in an interactive format is an important part of many blogs. Most blogs are primarily textual, although some focus on art (art blog), photographs (photo blog), videos (video blogging), music (MP3 blog), and audio (podcasting).

Wiki

A wiki is a webpage or set of Webpages that can be easily edited by anyone who is allowed access. Wiki is a collaborative tool that facilitates the production of a group work. Wiki pages have an edit button displayed on the screen and the user can click on this to access and easy - to use online editing tool to change or even delete the contents of the page in question. Simple, hypertext style of linking between pages is used to create a navigable set of pages. Wiki allows learners to participate in collaboratively building resources. An essential part of reflective learning is that learners should be encourage to reflect on their knowledge and make it explicit; wikis allow this reflection to be done collaboratively, moving closer to a fully social constructivist mode of learning. Because of their very low technological barriers yet very rich flexible functionality, wiki affords the opportunity to offer collaborative, constructive learning more extensively in our teaching learning environment (McMullin, 2005).

Collaborative learning

The potentiality of the online environment for collaborative learning and mutual support among students was identified early in its history during the late 1980's and early 1990's. Almost all emerging online literature refers to learning as a social experience, and assumes greater flexibility offered by online technologies which can help support the needs

of diverse learners. Network facilitates student's collaboration even in situations where there are no opportunities for face-to face conversation. Collaborative learning is the acquisition by individuals of knowledge, skills and attitudes occurring as the result of group interaction. In collaborative learning students are encouraged or required to work together on a learning task, so that they can encounter different points of view which may bring to light their misconceptions and give rise to synergistic solutions.

ICT has made it easier to study as well as teach in groups or in clusters. With online networking we can be united together to do the desired task. Efficient postal systems, the telephone (fixed and mobile), and various recording and playback systems based on computer technology all have a part to play in educational broadcasting in the new millennium. The Internet and ICTs Web sites are now familiar to many children in developed countries and among educational elites elsewhere, but ICT remains of little significance to very many more, who lack the most basic means for subsistence.

M-learning

Mobile learning simply means "Learning on the move", "any sort of learning that happens where the learner is not at a fixed. Pre-determined location or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies". M-learning means "acquisition of any knowledge and skill through using mobile technology anytime, anywhere that results in alteration of behavior." The term covers learning with portable technologies, where focus is on the mobility of the learner interacting with portable or fixed technology, learning in mobile society with a focus on how its institutions can accommodate and support learning of an increasingly mobile population.

'Mobile Learning' is commonly abbreviated to "m-learning", has different meanings for different communities. Mobile learning is the learning accomplished with the use of small, portable, computing devices. These computing devices include Smartphone, Personal Digital Assistant (PDA) and similar hand-held devices. Learning that happens across locations, or that takes advantage of learning opportunities offered by portable technologies with is named as "Mobile Learning" (M.L. focuses on the mobility of the learner, interacting with portable technologies and learning that reflects a focus on how society and educational institutions can accommodate and support an increasingly mobile population. Peters (2007) viewed mobile

learning as a useful component of the flexible learning model and also stated that it was a subset of e-learning, a step toward making the educational process, “just in time, just enough and just for me”.

Merits of Using Digital Tools in Teaching

Teaching at school as well as Higher Education, mostly, concentrates on giving information which is not the sole objective of teaching. Along with giving information, the other objectives are:

- developing understanding and application of the concepts
- developing expression power
- developing reasoning and thinking power
- development of judgment and decision - making ability
- improving comprehension, speed and vocabulary
- developing self-concept and value clarification
- developing proper study habits
- developing tolerance and ambiguity, risk taking capacity and scientific temper etc.,

With the present infrastructure, class size, availability of teachers, quality of teachers, training of teachers, it is difficult to achieve all the objectives. Further, most of the teachers use Lecture Method which does not have potentiality of achieving majority of above mentioned objectives. The objectives are multi-dimensional in nature, so for their achievement multiple methods should be used in an integrated fashion. It is a well-known fact that not a single teacher is capable of giving up-to-date and complete information in his own subject. In the Internet many websites are available freely which may be utilized by teachers and students for understanding different concepts, improving vocabulary, developing reasoning and thinking, etc.

Conclusion

Thus, Technology has enormous potentiality to deliver many numbers of benefits to the learners and teachers. Unless we use Technology, one cannot obtain up-to-date information to face the competitive world. Using Technology is the need of the hour and essential part of the life of every individual who wish to enrich one's life.

To conclude we can say that with the inclusion of technology, the concept of education is undergoing a modification, for the betterment of the students as well as the teachers.

References

- Kumar, K. K. (2005). *Mass communication in India*. Mumbai: Jaico Publishing House.
- Maheshwari, V. K. (2016). *The concept of smart classroom*. Retrieved from <http://www.vkmaheshwari.com/WP/?p=2352>
- Ministry of Human Resource Development. (n.d.). *Highlights of new initiatives taken by the Ministry of HRD*.
- National Programme on Technology Enhanced Learning. (2017, July 6). *SWAYAM*. <https://swayam.gov.in>
- ResearchGate. (n.d.). *Sign up*. <https://www.researchgate.net/signup>
- Techopedia. (n.d.). *Massive open online course (MOOC)*. <https://www.techopedia.com/definition/29260/massive-open-online-course-mooc>
- Vikaspedia. (n.d.). *E-Pathshala*. <http://vikaspedia.in/education/interactive-resources/e-pathshala>
- Wikipedia contributors. (n.d.). *Media communication*. In *Wikipedia*. https://en.wikipedia.org/wiki/Media_communication
- Wikipedia contributors. (n.d.). *Shodhganga*. In *Wikipedia*. <https://en.wikipedia.org/wiki/Shodhganga>
- Important India. (n.d.). *Media: Advantages and disadvantages*. <https://www.importantindia.com/22940/media-advantages-disadvantages>
- INFLIBNET Centre. (n.d.). *Information and Library Network (INFLIBNET)*. <http://www.netugc.com/information-and-library-network-inflibnet>
- Google Play Store. (n.d.). *SWAYAM app*. <https://play.google.com/store/apps/details?id=in.gov.swayam.app&hl=en>