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# "Enhancing Pre-Service Teacher Achievement through ICT: A Comparative Study of B.A.-B.Ed. and B.Sc.-B.Ed. Students"

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### ABSTRACT :

The integration of Information and Communication Technology (ICT) in teacher education has gained global prominence, revolutionising pedagogical methods and reshaping the learning experience for pre-service teachers. This study investigates the impact of ICT on academic attainment among integrated B.A.-B.Ed. and B.Sc.-B.Ed. students at a teacher training institution in Jaipur. Employing a descriptive survey design and purposive sampling, data were collected from 120 students using a structured questionnaire. An independent samples t-test was conducted to evaluate differences in academic achievement between the two groups. The results revealed a statistically significant difference, with B.Sc.-B.Ed. students outperforming their B.A.-B.Ed. counterparts (t = 2.53, p < 0.05). The findings suggest that disciplinary backgrounds influence students' engagement with ICT tools and learning outcomes. The study underscores the importance of designing differentiated instructional strategies to address academic diversity among students in integrated teacher education programs. It also highlights the potential of ICT in bridging learning gaps and improving the effectiveness of teacher training curricula.

KEYWORDS: ICT In Education, Pre-Service Teachers, Academic Achievement, Digital Pedagogy, Educational Technology.

# INTRODUCTION

Information and Communication Technology (ICT) has, in the past few years, moved to the centre of educational development all over the world. The incorporation of digital technologies, applications, and resources in pedagogical practices has made a considerable impact on the delivery, access, and experience of education. This change has a special meaning in teachers' colleges because that's where future teachers are trained. With the changes in today's classrooms, student-teachers need more than just content knowledge; they need digital literacy skills for 21st-century teaching and learning. ICT provides new opportunities for teaching and learning, and its quality use can improve the academic achievement of learners significantly (UNESCO, 2023). In teacher preparation, ICT facilitates personalised learning, encourages student-entered pedagogy, and makes instruction more effective. Digital simulations, learning management systems, educational apps, online assessments and virtual collaborative platforms are some of the tools that have proven to enhance the learning atmosphere. Research shows that when ICT is purposefully woven into teacher education, it has the potential to enhance the critical thinking, engagement, and educational achievement of the students (Kirkwood & Price, 2014). In addition, ICT encourages two central characteristics of professional teachers: independent learning and reflection.

However, integrating ICT has not always been a straightforward process. Infrastructure challenges, faculty and student levels of digital literacy and access to quality digital content continue to be constraints for many institutions. Such barriers can impede the positive intentions of ICT and the health effects it has the potential to have on educational achievement. As such, the role of ICT use in shaping student achievement is still complex and context-specific. It is not just the technology that is important, but also how it is used pedagogically to support learning outcomes.

Teacher education schools enjoy a special position in the education system, as they prepare future education providers. ICT's role in bettering education at these colleges affects both the trainees and the students they will teach. This issue has raised the need to explore the role of ICT in enhancing academic performance and professional competence of student-teachers. Previous research (Tondeur et al., 2020) indicates that technology integration should be based on specific educational goals and implies that ICT use is most effective when anchored in solid pedagogy.

The purpose of this research paper is to explore the effect of ICT on the learning achievement of students of teacher training institutions. This paper aims to present empirical evidence on the opportunities and challenges associated with using ICT in teacher education and how it helps to shape the learning of pre-service teachers in an era of digital tolerance. The results may have further implications for the general field of EdTech and for the practice of teaching and learning in teacher education.

# LITRETURE REVIEW

• Shukla, and Mishra (2023) examined the impact of ICT-based education during the post-COVID era in eastern India, focusing on 180 B.Ed. and M.Ed. trainee teachers. The study highlighted the growing integration of ICT in higher education, especially in West Bengal, and explored the gap between theoretical knowledge and practical application. It also analyzed trainee-teachers' attitudes toward ICT in both rural and urban settings, emphasizing the shift in educational skills post-pandemic.

- Hossain (2023) emphasized the vital role of ICT integration in teacher education, particularly through EPC courses like 'Critical Understanding of ICT'. The study analyzed ICT use during B.Ed. internships, revealing that 80% of lessons incorporated ICT tools. It explored student teachers' perceptions, challenges faced, and the future potential of ICT-based learning in India, especially West Bengal. The findings support the need for policy-driven, practical strategies for implementing technology in pre-service teacher training programs.
- Sharma and Verma (2021) reviewed the impact of ICT tools—like multimedia, e-books, and online platforms—on learning outcomes in Indian teacher training institutions. They found ICT significantly enhances conceptual understanding, retention, and knowledge application. The study supports a learner-centered approach, enabling trainees to access resources flexibly and engage actively. However, it also highlights challenges in balancing ICT with traditional teaching methods, which still prevail in many classrooms across India, limiting the full potential of digital integration.
- Patel and Singh (2020) examined the role of ICT in enhancing teacher performance through a literature review of Indian teacher training institutions. They found that ICT-based training helps teachers adopt innovative teaching methods, improving classroom management and lesson delivery. Evidence showed that trainees using ICT performed better in teaching assessments. The review highlights ICT's role in professional development and stresses the need for training programs that integrate both technological and pedagogical skills for effective teaching.
- Al-Awidi and Aldhafeeri (2022) evaluated ICT training effectiveness among pre-service teachers in Kuwait through surveys, observations, and assessments. Structured, hands-on workshops significantly improved instructional design, lesson planning, and tech confidence. Contextualized training—linking ICT tools to subject-specific teaching—proved more effective than generic instruction. Modules combining theory and practice boosted practicum performance. Post-training mentorship further enhanced digital skill retention and classroom success. The study recommends designing practical, pedagogy-aligned ICT programs supported by ongoing mentorship to improve teacher education outcomes.
- Baran, Uygun, and Altan (2021) conducted a literature review to identify essential ICT integration competencies for pre-service teachers. They argue that technical skills alone are inadequate; effective ICT use requires digital pedagogy, critical thinking, adaptability, assessment literacy, and reflective practice. Synthesizing global frameworks, they propose a multidimensional competency model. The study emphasizes embedding ICT throughout teacher education curricula. This holistic approach enhances teaching strategies, fosters engaging learning environments, and ultimately improves student outcomes through informed, reflective ICT use.

# **OBJECTIVE**

To study of the difference between the integrated B.A. B.Ed. & integrated B.Sc. B.Ed. course students.

# METHODOLOGY

The study employed a descriptive survey research design to investigate the impact of Information and Communication Technology (ICT) on the learning attainment of students at a teacher training institute. A structured questionnaire was developed to collect data, encompassing students' usage patterns of ICT tools, academic performance, and study habits, along with relevant demographic information.

### • VARIABLE

In the present Study, ICT is the Independent Variable, while Learning Attainment is Dependent Variable.

#### POPULATION AND SAMPLING

In the present study, the target population comprises integrated course students from the Jaipur region; with a sample of 120 integrated course students selected using the purposive sampling method.

#### HYPOTHESIS

There is no significant difference between the integrated B.A. B.Ed. & integrated B.Sc. B.Ed. course students.

Group	N	Mean	Standard Deviation	t-Ratio	Signification Level	Result
B.A-B.Ed. Students.	60	52.41	0.70	2.53	0.05	Hypothesis is
B.ScB.Ed. Students.	60	52.93	1.41			Rejected.

Table-01

#### **Graphical Presentation:**



# RESULT

The data presents a comparative analysis of learning attainment between two groups of teacher education students: B.A.-B.Ed. and B.Sc.-B.Ed., with 60 students in each group. The mean score of B.A.-B.Ed. students is 52.41 with a standard deviation of 0.70, while the B.Sc.-B.Ed. students have a slightly higher mean score of 52.93 and a standard deviation of 1.41. To determine whether the observed difference in mean scores is statistically significant, an independent samples t-test was conducted. The calculated t-ratio is 2.53, which exceeds the critical value of 1.9803 at the 0.05 significance level with 118 degrees of freedom. Since the calculated t-value is greater than the tabulated value, the null hypothesis, which states that there is no significant difference between the learning attainment of B.A.-B.Ed. and B.Sc.-B.Ed. students, is rejected. This indicates that the difference in mean scores between the two groups is statistically significant at the 5% level.

# DISCUSSION

The rejection of the null hypothesis implies that academic attainment does differ significantly between B.A.-B.Ed. and B.Sc.-B.Ed. students. Although the numerical difference in mean scores (0.52 points) may appear modest, the statistical analysis confirms its significance. This suggests that the background discipline of students entering teacher training programs could have a tangible impact on their academic performance within those programs. B.Sc.-B.Ed. students, coming from science-oriented academic streams, may benefit from more systematic, quantitative, and analytical training, which can enhance their performance in structured, outcome-based evaluations common in teacher education curricula. On the other hand, B.A.-B.Ed. students, who often possess a humanities-focused academic foundation, may engage more with conceptual or discursive modes of learning, which might not always align with standardized assessment metrics.

Furthermore, the greater standard deviation among B.Sc.-B.Ed. students (1.41 compared to 0.70 for B.A.-B.Ed.) suggests a wider range of performance within the group, indicating both high-achieving and lower-performing individuals. This could be reflective of varying levels of prior preparation or aptitude in science subjects. Nevertheless, the overall higher mean suggests a comparative advantage. These findings highlight the importance of acknowledging subject-specific learning tendencies and designing instructional strategies that address the academic diversity of students entering integrated teacher training programs. Institutions may consider offering tailored academic support and differentiated instruction to bridge the performance gap and ensure all student cohorts achieve their potential.

# CONCLUSION

The null hypothesis's rejection suggests a significant difference in academic attainment between B.A.-B.Ed. and B.Sc.-B.Ed. students. Although the numerical difference in mean scores (0.52 points) may appear modest, the statistical analysis confirms its significance. The result suggests that the background discipline of students entering teacher training programmes could have a tangible impact on their academic performance within those programmes. B.Sc.-B.Ed. students, who come from science backgrounds, might do better in teacher training because they are used to more organised, number-based, and analytical learning, which helps them succeed in the structured tests often used in these programs. On the other hand, B.A.-B.Ed.

students, who often possess a humanities-focused academic foundation, may engage more with conceptual or discursive modes of learning, which might not always align with standardised assessment metrics.

Furthermore, the greater standard deviation among B.Sc.-B.Ed. students (1.41 compared to 0.70 for B.A.-B.Ed.) suggests a wider range of performance within the group, indicating both high-achieving and lower-performing individuals. The difference could be reflective of varying levels of prior preparation or aptitude in science subjects. Nevertheless, the overall higher mean suggests a comparative advantage. These findings highlight the importance of acknowledging subject-specific learning tendencies and designing instructional strategies that address the academic diversity of students enrolled in integrated teacher training programs. Institutions may consider offering tailored academic support and differentiated instruction to bridge the performance gap and ensure all student cohorts achieve their potential.

# **RECOMMENDATION:**

- Utilize Hybrid and Interactive Learning Approaches: Promote moving away from traditional lectures towards blended learning involving the use of ICT tool (e.g. Learning Management Systems (LMS), video lessons, simulations and interactive modules) for enhanced student engagement and understanding.
- Foster Gender-Inclusive Access to ICT: As there is no significant gender difference in ict-related academic outcomes in this study, it is crucial for institutions to advocate an equitable ICT policy, raising equal access and support for both genders.
- Monitor and Assess Use of ICT on a Regular Basis: Put in place mechanisms for ongoing assessment of ICT tools and their effects on student learning results. This strategy can be optimized using feedback mechanisms and performance analytics.
- *Promote Reflective and Learner-Driven Learning*: ICT has to be employed to develop student teachers as independent learners, critical thinkers and self-assessors and ultimately to make them lifelong learners and reflective practitioners.
- Institution Level Develop Policy Guidelines: Clear ICT integration policies relevant to national digital education initiatives, need to be developed both by educational institutions and policy-makers for sustainability and scaling across training institutions.
- ICT Pedagogy Research and Improvement: Encourage institution-centric research on novel ICT based approaches, local customisation and culturally appropriate e-content to improve the quality and effectiveness of digital education.

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