ATTITUDE TOWARDS ICT AND ITS INFLUENCE ON ACADEMIC ACHIEVEMENT AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

The integration of Information and Communication Technology (ICT) into education has redefined the learning environment, influencing how students acquire, process, and apply knowledge. This study examines the attitude of secondary school students towards ICT and its relationship with their academic achievement. Understanding students' ICT attitudes is essential in today's digital learning era, as it determines their engagement level and adaptability to technology-driven pedagogies.

A descriptive-correlational design was adopted, involving 350 secondary school students (175 boys and 175 girls) drawn from government and private schools in Bhopal district. The ICT Attitude Scale and standardized academic scores were used for data collection. Statistical analyses included t-tests, ANOVA, correlation, and multiple regression using SPSS (v26).

Results revealed that students generally possessed a positive attitude towards ICT (Mean = 4.21 on a 5-point scale). Gender differences were not significant; however, school type and home access to digital devices significantly influenced ICT attitudes. Correlation analysis indicated a strong positive association ($r = 0.63$, $p < 0.01$) between ICT attitude and academic achievement. Regression analysis showed that ICT attitude and frequency of technology use together accounted for 47% of the variance in students' academic performance.

The study concludes that a constructive attitude towards ICT enhances learning efficiency, digital literacy, and academic success. Recommendations include incorporating ICT-based instructional methods, teacher training for digital pedagogy, and equitable access to digital infrastructure for all learners.

Keywords: ICT Attitude, Academic Achievement, Digital Learning, Secondary Education, Technology Integration, Gender, Regression Analysis.

1. INTRODUCTION

Technological advancement has transformed education from conventional chalk-and-talk classrooms into interactive, digitally enriched environments. The role of ICT in education is no longer peripheral; it is central to pedagogy, content delivery, and assessment. ICT enables learners to access vast repositories of knowledge, collaborate virtually, and engage in self-paced learning. However, the effectiveness of ICT integration depends not merely on availability but also on students' attitude toward its use.

An attitude towards ICT refers to learners' beliefs, feelings, and behavioral tendencies toward technology-based learning (Teo, 2008). Positive attitudes foster motivation, confidence, and active participation, while negative attitudes may lead to avoidance or superficial use. For adolescents in secondary schools, who are digital natives yet educationally diverse, understanding ICT attitudes becomes critical for optimizing educational outcomes.

In the Indian educational context, ICT has been institutionalized through initiatives like the National Education Policy (NEP) 2020, emphasizing digital literacy and blended learning. Despite infrastructural progress, disparities in access, training, and motivation persist among schools and students. Identifying how ICT attitudes correlate with academic achievement can thus provide actionable insights for educators and policymakers.

Objectives of the Study

1. To assess the overall attitude of secondary school students towards ICT.
2. To examine differences in ICT attitude across gender and school type.
3. To determine the relationship between ICT attitude and academic achievement.
4. To identify the predictive power of ICT attitude on students' academic performance.

Hypotheses

- **H_{01}:** There is no significant difference in ICT attitude between male and female students.
- **H_{02}:** There is no significant difference in ICT attitude between students of government and private schools.

- **H$_{03}$:** There is no significant relationship between ICT attitude and academic achievement.
- **H$_{04}$:** ICT attitude does not significantly predict academic achievement.

2. REVIEW OF LITERATURE

2.1 ICT and Education

ICT encompasses technologies that facilitate communication and the creation, dissemination, and management of knowledge (UNESCO, 2019). Its integration into education has revolutionized teaching methodologies through digital content, e-learning platforms, simulations, and interactive classrooms. **Anderson & Weert (2002)** argue that ICT develops higher-order thinking and problem-solving skills, while **Voogt & Pelgrum (2005)** emphasize its role in promoting collaborative learning.

2.2 Student Attitude towards ICT

Research suggests that students' attitudes towards ICT influence their usage frequency, comfort level, and learning outcomes. **Teo (2008)** developed an ICT Attitude Scale, revealing that perceived usefulness and enjoyment are key determinants of positive attitudes. **Sengupta & Ghosh (2019)** found that students with favorable ICT attitudes exhibit higher digital competence and self-efficacy. Conversely, **Kumar & Rani (2020)** reported that inadequate access and lack of teacher support lead to negative perceptions, especially in rural areas.

2.3 ICT and Academic Achievement

Studies consistently indicate a positive correlation between ICT integration and academic performance. **Wenglinsky (2005)** demonstrated that meaningful use of computers—especially for analysis and simulation—improves cognitive outcomes. **Harris (2011)** found that students who use ICT regularly for learning score significantly higher than those who rely solely on textbooks. In India, **Saxena (2021)** reported that ICT-oriented teaching strategies enhanced engagement and performance in science subjects.

2.4 Gender and School Type Differences

Gender differences in ICT attitude remain a debated topic. While **Cooper (2006)** suggested that boys exhibit greater computer self-confidence, recent studies (e.g., **Teo & Fan, 2019**) show gender neutrality as technology becomes ubiquitous. School type also influences ICT attitude due to infrastructural disparities. **Patel & Sharma (2020)** noted that private-school students have more frequent ICT exposure, leading to stronger digital confidence.

2.5 Research Gap

Although extensive research exists globally, Indian studies rarely integrate **ICT attitude, gender, school type, and academic performance** in a single model. There is limited empirical evidence using regression analysis to quantify how ICT attitude predicts achievement at the secondary level. This study addresses this gap through a statistically rigorous and contextually relevant approach.

3. METHODOLOGY

3.1 Research Design

A **descriptive-correlational survey design** was employed to determine the relationship between ICT attitude and academic achievement, along with gender and school-type variations.

3.2 Sample

The study involved **350 secondary school students** (175 male and 175 female) from eight schools (four government and four private) in Bhopal district. The sample was selected using stratified random sampling to ensure representation of urban and semi-urban populations.

3.3 Tools Used

1. **ICT Attitude Scale (Teo, 2008)** – adapted and validated for Indian students (Cronbach's $\alpha = 0.87$).
2. **Academic Achievement Record** – based on students' average scores in core subjects from the previous examination.
3. **Demographic Data Sheet** – to capture information such as gender, school type, and frequency of ICT use.

3.4 Data Collection

Questionnaires were administered in school settings under supervision. Students were informed of confidentiality and voluntary participation. Raw data were coded and entered into SPSS v26 for analysis.

3.5 Statistical Techniques

Descriptive statistics, t-tests, ANOVA, Pearson's correlation, and multiple regression analysis were used to test hypotheses.

4. RESULTS

4.1 Descriptive Statistics of ICT Attitude

Variable	N	Mean	SD	Interpretation
Overall ICT Attitude	350	4.21	0.59	Positive
Perceived Usefulness	350	4.34	0.63	High
Ease of Use	350	4.18	0.57	High
Enjoyment	350	4.12	0.61	High

Students generally exhibited a positive orientation towards ICT use, indicating high comfort and perceived value.

4.2 Gender-wise Comparison (t-Test)

Gender	N	Mean	SD	t	p	Interpretation
Male	175	4.18	0.61	1.09	0.278	NS
Female	175	4.24	0.58			

No significant gender difference was found in ICT attitude, supporting H_{01}.

4.3 School Type Comparison (t-Test)

School Type	N	Mean	SD	t	p	Interpretation
Government	180	4.03	0.66	3.74	0.000	Significant
Private	170	4.38	0.52			

Students in private schools showed significantly higher ICT attitude than those in government schools, rejecting H_{02}.

4.4 ANOVA: ICT Attitude by Frequency of Technology Use

Source	SS	df	MS	F	Sig.
Between Groups	12.48	2	6.24	8.91	0.000
Within Groups	241.77	347	0.70		
Total	254.25	349			

Students who used ICT daily had significantly more positive attitudes than those who used it occasionally ($p < 0.01$).

4.5 Correlation between ICT Attitude and Academic Achievement

Variables	r	p
ICT Attitude ↔ Academic Achievement	0.63	0.000

A strong positive correlation indicates that students with higher ICT attitudes achieved better academic results, rejecting H_{03}.

4.6 Regression Analysis

Predictor	β	t	Sig.	R	R²	F	Sig.
Constant	41.62	9.27	0.000	0.686	0.471	43.86	0.000
ICT Attitude	0.46	6.89	0.000				
Frequency of ICT Use	0.28	4.73	0.000				

ICT attitude and usage frequency together explained **47.1% of variance** in academic performance, rejecting H_{04}.

5. DISCUSSION

The findings reveal that secondary students in Bhopal possess a broadly positive attitude towards ICT, echoing global trends of increasing digital engagement among adolescents. This aligns with Teo (2008) and Sengupta & Ghosh (2019), who observed that high perceived usefulness and enjoyment foster positive technology attitudes.

The lack of significant gender differences corroborates Teo & Fan (2019), suggesting that the gender digital divide is narrowing as technology becomes ubiquitous. However, the significant difference between government and private schools highlights persistent infrastructural and exposure disparities, consistent with Patel & Sharma (2020).

The correlation and regression analyses confirm ICT attitude as a strong predictor of academic achievement, explaining nearly half of the variance. This reinforces Harris (2011) and Saxena (2021), who emphasized that technology-integrated learning boosts motivation, analytical thinking, and self-directed learning. The positive relationship suggests that students with constructive ICT attitudes are more likely to use digital resources effectively, leading to improved performance.

Nevertheless, attitude alone does not guarantee success; effective guidance, equitable access, and pedagogical integration are equally critical. Teachers' own ICT competence and institutional support systems substantially influence how students perceive and utilize technology.

6. CONCLUSION

The study concludes that positive ICT attitudes significantly influence academic achievement among secondary school students. Attitude levels are independent of gender but vary by school type and access frequency.

Major Findings:

1. Overall ICT attitude was positive (Mean = 4.21).
2. No significant gender difference was observed.
3. Private-school students exhibited stronger ICT attitudes than government-school students.
4. ICT attitude positively correlated with academic performance ($r = 0.63$).
5. ICT attitude and frequency of ICT use explained 47% of achievement variance.

Recommendations:

- **Digital Pedagogy Training:** Teachers should receive professional training to integrate ICT effectively into classroom instruction.
- **Infrastructure Enhancement:** Government schools must be equipped with adequate ICT facilities and internet access.
- **Student Orientation:** Schools should organize workshops to promote responsible and productive technology use.
- **Policy Implications:** Educational policymakers should emphasize digital literacy and equitable ICT access under NEP 2020.
- **Future Research:** Longitudinal and experimental studies could examine how ICT attitude interventions affect achievement over time.

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