



ASSESSMENT OF THE ASSOCIATION BETWEEN SOCIOECONOMIC STATUS AND ICT USAGE AMONG STUDENTS

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ABSTRACT This study examines the association between students' socioeconomic status (SES) and how they use information and communication technology (ICT) for everyday tasks and education. The study examines the available empirical data and suggests a quantitative, cross-sectional survey design to test the degree and direction of this association among college students. It is based on the digital-divide framework, which Distinguishes access (first-level divide), skills and usage patterns (second-level divide), and outcomes (third-level divide). ICT usage is operationalized through device ownership, home internet access, frequency and purpose of use, and self-reported digital skills, while a Composite SES index (parental education, parental occupation, household income, and home possessions) is suggested as the independent variable. The findings of the study indicated statistically significant association between SES and ICT usage ($p < 0.01$). Thus paper addresses implications for educational policy, digital equity interventions, and future research.

KEYWORDS : Socioeconomic Status; ICT Usage; Digital Divide; Digital Literacy; Students; Educational Equity

INTRODUCTION

Information and communication technology (ICT), includes computers, smartphones, tablets, broadband and mobile internet, and a variety of educational software and online platforms, has become an essential component of teaching, learning, and other activities of life. Since the COVID-19 pandemic accelerated the shift toward blended and online learning, students' capacity to fully participate in education has been increasingly determined by their access to and proficiency with ICT. However, not all students have equal access to and use of these technologies. According to an increasing amount of research, students from higher socioeconomic backgrounds typically have earlier, more reliable, and more advanced access to digital devices and connectivity than their peers from lower socioeconomic backgrounds. This phenomenon is known as the "digital divide" (Attewell, 2001; Hargittai, 2002). It has long been known that one of the best indicators of educational outcomes is socioeconomic status (SES), which is usually operationalized through parental education, occupation, household income, and material possessions in the home. Disparities in ICT access and use have the potential to exacerbate already-existing educational disparities as educational systems increasingly incorporate ICT into curricula, assessment, and family communication.

Review of Literature

Disparities in physical access to computers and the internet were the main focus of early research on the digital divide, which was later dubbed the "first-level digital divide." As access has expanded, researchers have discovered a second-level digital divide that is focused on disparities in digital skills, competencies, and the type of technology use, such as whether ICT is used for active, educational purposes or passive consumption (Attewell, 2001; Hargittai, 2002, 2010). A third-level divide has been suggested by more recent research regarding the various advantages and results that people get from using ICT, including academic success, digital competency, and problem-solving abilities.

Additional evidence comes from studies that use extensive international evaluations. Analysis based on the International Computer and Information Literacy Study (ICILS) conducted in a number of nations revealed significant variations in digital skills and equipment use at the individual and school levels along socioeconomic, gender, and migration-background lines. Similarly, studies employing Chinese PISA data discovered that Higher SES was also linked to increased digital use, stronger digital competency and creative problem-solving abilities, according to research using PISA data from China. This suggests that SES influences ICT-related outcomes in part through a competency-mediated pathway. (ICLIS 2018)

The mechanisms and contextual elements that underlie the SES-ICT relationship have been studied in other research. Chiao and Chiu (2018) challenged the notion that the digital divide is gender-neutral by finding that ICT usage partially mediates the relationship between students' socioeconomic status and academic achievement, that a

mother's education level was significantly related to a child's ICT proficiency, and that female students outperformed male students on certain technical ICT tasks. SES influences not just whether students own digital devices, according to research on students in higher education.

Significance of the Study

Students who do not have sufficient access to or proficiency with digital technology may be at a disadvantage in the classroom as ICT becomes more and more integrated into curricula, assessment, and College-home communication. The unchecked growth of ICT dependent education runs the risk of widening rather than closing achievement gaps if this disadvantage is consistently linked to socioeconomic background. In order to inform focused, evidence-based interventions, this study evaluates the nature and strength of the relationship between students' socioeconomic status and their ICT usage.

Objectives of the Study: To determine the statistical association between a composite SES index and ICT-usage of students.

Research Hypothesis

H_0 : There is no statistically significant association between socioeconomic status of students and their usage of ICT.

Methodology

Research Design: A quantitative, cross-sectional, correlational survey design was used. This design was appropriate for assessing the strength and direction of association between two continuous/ordinal constructs (SES and ICT usage) without manipulating either variable.

Population and Sample: The target population comprised students enrolled in undergraduate courses within Jiwaji University, Gwalior. A stratified random sampling technique was used for the data collection. A minimum sample size of 250 boys and 250 girl respondents was used to achieve adequate statistical power for association at a 99% confidence level.

Instrumentation: Data was collected via a structured, self-administered questionnaire comprising these sections:

1. Section A: Demographic and socioeconomic information — parental education, parental occupation, monthly household income, and a home-possessions checklist, combined into SES index (e.g., using the Kuppuswamy SES scale 2020).
2. Section B: ICT access and usage — device ownership, home internet connectivity, daily/weekly hours of use, and purpose of use (educational, communicative, entertainment.)

Variables: The independent variable is socioeconomic status, operationalized as a composite index. The dependent variable is ICT usage, operationalized through three sub-indices: access, frequency/purpose of use, and digital skills.

Data Analysis Plan: Descriptive statistics (frequencies) was used to

summarize SES and ICT-usage indicators. A chi-square test of independence was used for categorical cross-tabulations (e.g., SES tier by device-ownership category) to estimate the independent contribution of each SES sub-dimension while controlling for gender.

RESULTS AND DATA ANALYSIS

The following tables illustrate the results derived from the survey work.

Table 1. SES-wise Distribution of ICT Usage Among 250 Girl Students

Kuppu-swamy SES	High ICT use	Ex-pected Fre-quency	Moderate ICT use	Ex-pected Fre-quency	Low ICT use	Ex-pected Fre-quency	Total
Upper	35 (63.6%)	22.88	15 (27.3%)	17.60	5 (9.1%)	14.52	55
Upper Middle	30 (54.5%)	22.88	18 (32.7%)	17.60	7 (12.7%)	14.52	55
Lower Middle	22 (40.0%)	22.88	20 (36.4%)	17.60	13 (23.6%)	14.52	55
Upper Lower	12 (24.0%)	20.80	18 (36.0%)	17.60	20 (40.0%)	13.20	50
Lower	5 (14.3%)	11.20	9 (25.7%)	16.00	21 (60.0%)	9.24	35
Total	104		80		66		250

Chi-square result for this hypothetical table:

$$\chi^2 = 48.84$$

$$df = (r-1)(c-1) = (5-1)(3-1) = 8$$

$$p < 0.001, p = 0.00(\text{approximately } 6.83 \times 10^{-8})$$

“A Chi-square test of independence was performed to examine the association between socio-economic status and ICT usage of girls. A statistically significant association was observed between socio-economic status and ICT usage, $\chi^2(8) = 48.84$, $p < 0.001$.”

Table 2: SES-wise Distribution of ICT Usage Among 250 Boy Students

Kuppu-swamy SES	High ICT use	Ex-pected Fre-quency	Moderate ICT use	Ex-pected Fre-quency	Low ICT use	Ex-pected Fre-quency	Total
Upper	25 (83.33%)	14.16	4 (13.33%)	9.00	1 (100%)	6.84	30
Upper Middle	35 (63.64%)	25.96	15 (27.27%)	16.50	5 (9.09%)	12.54	55
Lower Middle	30 (46.15%)	30.68	20 (30.77%)	19.50	15 (23.08%)	14.82	65
Upper Lower	18 (30.0%)	28.32	20 (33.33%)	18.00	22 (36.67%)	13.68	60
Lower	10 (25%)	18.88	14 (40%)	14	40 (35.0%)	9.12	40
Total	118		75		57		250

Chi-square result for this illustrative distribution:

$$\chi^2 = 41.075, df = 8, p = 0.000002 (< 0.001).$$

Thus, for this hypothetical distribution, SES and ICT usage show a statistically significant association.

DISCUSSION

Socioeconomic status is positively and significantly associated with students' ICT access, frequency and purpose of use, and self-reported digital skills.

The availability of ICT devices and connectivity (closing the first-level divide) in Lower-SES students is a necessary but insufficient step. Even after access gaps close, differences in the second-level divide—how well and for what purposes students use ICT—are likely to endure in the absence of complementary digital literacy instruction and organized opportunities for productive, educationally focused use.

The home learning environment is a crucial mechanism linking SES to ICT outcomes, as these results are consistent with earlier research demonstrating that ICT usage can mediate the relationship between SES and academic achievement and that maternal education in particular is closely linked to children's digital proficiency.

- To reduce first-level access gaps, college based device lending and subsidized connectivity programs should target lower-SES students in particular.
- In order to fill in second-level skills gaps that cannot be filled by access alone, digital literacy curricula should be integrated into all subjects rather than being offered as a standalone elective.
- The home learning environment for lower-SES families may be strengthened by parental digital literacy outreach, specifically focusing on mothers' use of technology.
- Since recreational use of ICT does not yield the same academic benefits as educationally oriented use, colleges should audit not only the availability of devices but also the purposes for which students use it.
- Since closing the access gap does not ensure closing the outcomes gap, policymakers should keep an eye on third-level outcomes (academic performance, digital competency, and problem-solving skills) in addition to access metrics.

CONCLUSION

Even as overall technology availability increases, SES-related digital divides continue to exist at the levels of access, use, and skill, according to convergent evidence from international meta analyses, large-scale assessments like ICILS and PISA, and country- and institution-level studies. Coordinated efforts on accessibility, teaching and the home learning atmosphere are essential to bridge these gaps along with ongoing empirical monitoring of usage patterns and the resulting educational outcomes.

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