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Impact of Google Search and Google Meet in Academic Activities in Under Graduate Students in West Bengal

Sreelogna Dutta Banerjee[1] & Jayanta Mete[2]
Research Scholar[1] & Former Professor & Dean[2], Department of Education
Faculty of Education, University of Kalyani, Kalyani, West Bengal, India-741235
sreelognadutta@gmail.com,
Sreelogna Dutta Banerjee ORCID ID – 0009-0006-7585-7182
Jayanta Mete ORCID ID – 0000-0002-9409-2983

Abstract

This quantitative study investigates the impact of two widely used digital tools — Google Search (for information seeking) and Google Meet (for synchronous online teaching) — on undergraduate students' academic activities in West Bengal, India. Drawing on a sample of undergraduate students from five colleges across urban and semi-urban districts, the study used a standardized questionnaire developed from the literature, validated through expert review, and refined through a pilot study (n = 40). The questionnaire measured frequency and purpose of Google Search use, perceived benefits and drawbacks (information quality, retention, academic integrity), and Google Meet's role in instructional access, engagement, and learning outcomes. Data were analysed with descriptive statistics, t-tests, and multiple regression to examine associations between tool-use patterns and self-reported academic performance and engagement. Illustrative results show high reliance on Google Search for quick information and assignment support, with mixed effects on deep learning and retention; Google Meet facilitated access and continuity of instruction but student engagement varied with instructor practices and network reliability. Findings highlight the need for digital literacy training, pedagogical redesign for synchronous online sessions, and institutional support to mitigate infrastructural inequities. Policy and pedagogical implications for higher education under NEP-2020-era digital expansion are discussed.

Introduction

The rapid digitization of higher education, accelerated by the COVID-19 pandemic, shifted much of undergraduate teaching and learning onto online platforms (Carmi et al., 2024). Two ubiquitous tools — Google Search and Google Meet — have become integral to students' academic workflows. Google Search functions as the primary gateway to information for many students, while Google Meet has been widely adopted by institutions as a synchronous delivery platform for lectures, tutorials, and meetings. Understanding how these tools shape academic behaviors and outcomes is critical for educators and policymakers seeking to harness digital advantages while addressing pedagogical and equity concerns.

In West Bengal — with its mix of metropolitan, semi-urban, and rural student populations — digital adoption has exposed both opportunities (wider access to content) and constraints (digital divide, infrastructural disparities, pedagogical readiness). The digital divide in West Bengal has been characterized in terms of first-order access (device/connection), second-order skills (digital literacy), and third-order outcomes differences, showing strong socio-economic effects on student performance (Maji & Laha, 2022; "Digital Divide in Education: Analysing Access, Equity and Challenges in West Bengal," 2025). Furthermore, primary school studies in the state highlight uneven access to online learning resources during lockdowns, which aggravates existing educational inequities (Sarkar, 2022).

Prior research has documented heavy reliance on Google and other search engines for academic tasks, but with mixed evidence on whether quick online searching promotes or undermines deeper learning and

retention (Glass, 2020). Similarly, empirical studies of Google Meet and analogous synchronous platforms document gains in continuity and access, yet report variability in student engagement and learning effectiveness depending on instructional design, interaction strategies, and network reliability (Setyawan et al., 2023; Al Faruq et al., 2022). These findings motivate a systematic quantitative investigation into how undergraduate students in West Bengal use Google Search and Google Meet in their academic activities, and what academic outcomes they perceive.

Review of Related Literature:

This study reviewed student perceptions of Google Gemini as a generative AI learning assistant in classroom settings **(Majidah et al., 2025)**. The survey, conducted with 45 students in the Educational Technology Study Program at Universitas Pendidikan Indonesia, revealed highly positive responses across four dimensions: Perceived Usefulness, Perceived Ease of Use, Attitude Toward Use, and Behavioural Intention to Use. Students reported that Gemini enhanced comprehension, efficiency, and relevance of learning content. They also found the tool easy to operate, enjoyable, and beneficial for classroom engagement. Additionally, participants expressed strong intentions to integrate and recommend Gemini for future academic activities.

Prasetyawan, Heriyanto, and Arfa (2024) stated that the information experience of Universitas Diponegoro students when using Google search to complete assignments. A qualitative approach with semi-structured interviews was employed to capture their practices. Findings indicated that students developed personal techniques for searching and were generally skilled in formulating queries, finding this stage relatively easy. However, they encountered difficulties in evaluating which results were most relevant. Prior knowledge strongly influenced their ability to determine useful sources. While most students shared similar strategies for keyword formulation, variations emerged in individual experiences, reflecting diverse approaches to optimizing Google as a study tool.

Objectives of the study:

Primary objective: To examine the impact of Google Search and Google Meet on academic activities of undergraduate students in West Bengal.

Specific objectives:

1. To describe the frequency and purposes of Google Search use in academic tasks among undergraduate students.
2. To assess undergraduate students' perceptions of Google Meet's effectiveness for course delivery, engagement, and learning.
3. To examine relationships between tool-use patterns (search frequency, Meet participation) and self-reported academic engagement and performance.
4. To identify barriers and student recommendations for more effective use of these digital tools.

Methodology

Research design

This is a **quantitative, cross-sectional survey** study. A structured questionnaire was developed, standardized, and administered to undergraduate students across selected colleges in West Bengal.

Population and sampling

The population comprised undergraduate students enrolled in BA, BSc, and BCom programs in selected colleges in West Bengal. A multi-stage cluster sampling approach was used to select five colleges representing urban and semi-urban districts. Within each college, convenience sampling of enrolled students attending classes (online/offline) was used. Target sample size: **N = 400** (approx. 80 students per college), designed to yield sufficient power for multiple regression analyses and subgroup comparisons.

Instrument: standardized questionnaire

The questionnaire had five sections:

1. **Demographics:** age, gender, course, year, residence (urban/rural), device ownership, data connectivity quality.
2. **Google Search use:** frequency (daily/weekly/monthly), primary purposes (assignments, background reading, quick answers, exam prep), self-rated reliance (Likert scale).
3. **Google Meet use:** frequency of attendance, session types (lectures, tutorials, group work), perceived instructional quality, and engagement.
4. **Outcomes and perceptions:** self-reported academic engagement, assignment completion, perceived learning gains, and retention (Likert scales).
5. **Barriers and recommendations:** open and closed items on connectivity, teacher practices, digital literacy needs.

Items were constructed using established measures where available (search behavior items adapted from Salehi et al., 2018), and newly written items for context-specific features.

Standardization: expert review and pilot study

To ensure content validity and clarity, the draft questionnaire underwent **expert review** by three subject-matter experts: (1) a higher-education researcher familiar with digital pedagogy, (2) a librarian/information science expert on search behaviours, and (3) a college teacher experienced with Google Meet instruction. Experts reviewed items for relevance, clarity, and cultural appropriateness; their feedback led to wording revisions and addition/removal of redundant items.

A **pilot study** (n = 40) was then conducted across two colleges (one urban, one semi-urban). Pilot data were used to compute internal reliability (Cronbach's alpha for multi-item scales), item-total correlations, and time-to-complete. Items with low item-total correlation (< .30) were revised or removed. Pilot results indicated good internal consistency for the main scales (example Cronbach's alpha values: Search Reliance $\alpha = .78$; Meet Engagement $\alpha = .81$). (Note: the alpha values reported here are illustrative of the pilot; replace with your actual pilot statistics when available.)

Data collection procedure

After institutional permissions, the questionnaire was administered online (Google Forms) and where needed as paper forms for students with connectivity constraints. Participation was voluntary, anonymous, and preceded by informed consent. Data collection spanned four weeks.

Data analysis

Data were exported to SPSS / R. Analysis included descriptive statistics (frequencies, means, SDs), independent-samples t-tests and ANOVA to compare subgroups (urban vs rural, discipline), Pearson correlations to examine relationships, and multiple linear regression to test whether patterns of tool use predicted self-reported academic engagement and perceived learning, controlling for demographics and connectivity.

Ethical considerations

The study followed institutional research ethics guidelines. Participation was voluntary, responses were anonymized, and no sensitive personal identifiers were collected. Results are reported in aggregate.

Findings (Illustrative / Example Results and Analysis Approach)

Note: the results below are **illustrative** to show how to present and interpret findings. Replace with your real sample statistics after you collect the data.

Sample characteristics (illustrative)

Total respondents: N = 392 (after cleaning). Mean age = 20.4 years (SD = 1.6). Gender: 58% female, 42% male. Course distribution: BA 46%, BSc 34%, BCom 20%. Residence: 62% urban, 38% semi-urban/rural. Device ownership: 94% own a smartphone, 42% own a laptop.

Google Search use

- Frequency: 81% reported daily use for academic tasks; 13% several times a week; 6% less often.
- Purposes: 74% used Google Search primarily for assignment quick facts; 52% used it for background literature; 48% used it for exam prep.
- Students reported moderate reliance on Google Search for immediate answers (Mean = 4.1 on a 5-point reliance scale, SD = 0.7).

Interpretation: High daily use for quick academic tasks aligns with prior studies showing Google's dominant role in student information seeking.

Google Meet use

- Attendance: 68% attended Google Meet sessions at least weekly during semester; 29% attended rarely.
- Perceived effectiveness: Mean perceived instructional effectiveness = 3.4 (5-point scale), with large variance.
- Engagement: 42% reported that sessions were interactive (polls, breakout discussions), while 58% described sessions as lecture-dominant.

Interpretation: Google Meet provided continuity of instruction but engagement depended on instructor practices (active learning elements). This mirrors literature indicating that synchronous platforms support access but require pedagogy redesign to maximize engagement.

Associations and regression

- Correlations: Search reliance correlated positively with assignment completion ($r = .28$, $p < .001$) but negatively with self-reported long-term retention ($r = -.19$, $p < .01$).
- Regression predicting perceived learning (controls: age, gender, connectivity): frequency of active Meet participation ($\beta = .32$, $p < .001$) and instructor use of active methods ($\beta = .29$, $p < .001$) significantly predicted higher perceived learning; mere attendance frequency was a weaker predictor ($\beta = .12$, $p = .07$). Search reliance predicted higher immediate assignment completion ($\beta = .21$, $p < .01$) but lower retention ($\beta = -.14$, $p = .03$).

Interpretation: These patterns suggest that while Google Search helps immediate task completion, it may not support deeper learning; Google Meet contributes to perceived learning when used interactively — consistent with international findings.

Barriers reported

Major barriers: unstable internet (reported by 61%), lack of devices (18%), poor pedagogical practices (45%), and inability to evaluate information quality from web sources (54%). Students recommended digital literacy workshops, teacher training for online engagement, and institutional support for better bandwidth/equipment.

Discussion

The illustrative findings resonate with broader literature. Predominant reliance on Google Search for immediate assignment demands reflects established patterns of search behaviour among students. However, the negative association with long-term retention echoes empirical concerns that quick online searching can undermine durable learning if not paired with deliberate retrieval practice and critical evaluation skills. Educators should therefore include structured training in search strategies, source

evaluation (scholar vs popular), and assignment designs that require deeper synthesis rather than copy-paste behaviours.

Google Meet's role is complex: it ensured continuity and accessibility, but learning benefits are strongly tied to how sessions are conducted. When instructors used interactive features and scaffolded engagement, students reported higher perceived learning. This aligns with research showing that synchronous platforms can be effective but demand pedagogical redesign (active learning, formative checks, asynchronous complements). Where connectivity is poor, the platform's benefits are constrained, highlighting equity concerns in West Bengal and similar regions.

Implications for policy and practice:

- **Digital literacy curricula**: Integrate information literacy and search-evaluation training into undergraduate programs.
- **Faculty development**: Train instructors in online pedagogy, interactive use of Google Meet, and blended designs incorporating asynchronous resources (recordings, readings).
- **Infrastructure**: Targeted investments to reduce the digital divide (campus Wi-Fi, lending devices, subsidized data).
- **Assessment design**: Develop assignments that require higher-order processing and discourage shallow copying from web sources.

Limitations

1. **Cross-sectional design** limits causal inference; observed associations do not prove causality.
2. **Sample and sampling**: Convenience elements in sampling may limit generalizability across all West Bengal colleges.
3. **Self-reported measures**: Reliance on self-report may introduce social desirability or recall bias.
4. **Illustrative results**: The numeric results presented here are illustrative — please replace them with your empirical findings. The methodology and analysis plan, however, are directly transferable.

Conclusion

Google Search and Google Meet are central to undergraduate academic activity in West Bengal, offering both advantages (access, continuity, quick information) and challenges (shallow learning, connectivity constraints, variable instructional practices). Policy and pedagogical responses — digital literacy instruction, faculty development in online pedagogy, and infrastructure investment — are necessary to transform tool availability into improved learning outcomes. Future empirical work using the standardized instrument described here, with rigorous sampling and longitudinal follow-up, will help clarify long-term effects on learning and performance.

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Appendix A — Questionnaire

(Below is a short list of items finalizing after expert review.)

1. **Search Frequency** (How often do you use Google Search for academic tasks? — Daily / Several times a week / Weekly / Rarely)
2. **Search Purposes** (Check all that apply: assignment quick facts, background reading, exam prep, citations, videos)
3. **Search Reliance Scale** (5 items; 1 = strongly disagree to 5 = strongly agree; e.g., "I depend on Google Search to complete my assignments quickly.")
4. **Meet Attendance** (How many Google Meet sessions do you attend weekly?)
5. **Meet Engagement Scale** (5 items; e.g., "Google Meet sessions conducted by my teachers are interactive and engaging.")
6. **Perceived Learning & Retention** (self-rated agreement items and one item on perceived long-term retention)
7. **Barriers** (connectivity, device access, instructor skills; checkbox + open comment)