

Student Digital Readiness Amidst the National Energy Emergency, Sy 2025–2026

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ABSTRACT

Assessing student digital readiness is essential for maintaining educational continuity and equity during emergency disruptions, such as the National Energy Emergency. Anchored in the Digital Divide Theory and Technology Acceptance Model (TAM), this study evaluated student digital readiness at Aldersgate College Inc. for Academic Year 2025–2026. This study used a quantitative descriptive survey design and gathered responses from N = 866 collegiate students across 13 academic programs and four-year levels. Data were analyzed using frequency and percentage distributions. Results revealed significant infrastructure bottlenecks: over half of respondents (58.55%) rely solely on smartphones for schoolwork, and less than half (44.46%) possess stable broadband internet, with 41.80% depending on prepaid mobile data. As a result, most students demonstrated basic digital literacy (64.09%), while 10.28% required external technical guidance. Spatial constraints were also prevalent, as 53.58% lacked a quiet study environment. Statistical testing rejected the null hypotheses, confirming significant disparities across academic levels and a strong positive relationship between infrastructure access and digital capability. To prevent academic exclusion, the institution must transition from synchronous, bandwidth-heavy setups toward low-bandwidth asynchronous models—such as offline digital course packets, curated resource bundles, extended submission windows, and campus digital study hubs.

Keywords: Digital readiness, digital divide, emergency remote teaching, educational equity, low-bandwidth instruction

INTRODUCTION

This study evaluates students' digital readiness at Aldersgate College Inc. for the Academic Year 2025–2026. Understanding student accessibility, hardware ownership, internet connectivity, and technical literacy is essential to guide institutional decisions, maintain educational continuity, and ensure equitable learning access amid the ongoing National Energy Emergency.

Statement of the Problem

This study aimed to assess the digital readiness of students at Aldersgate College Inc. during the national energy crisis. Specifically, it sought to answer the following questions:

1. What is the demographic distribution of student respondents in terms of Course and Year Level?
2. What is the level of student access to digital hardware and devices?
3. What is the condition and stability of student internet connectivity at home?
4. What is the self-assessed level of digital literacy and technical capability among students?
5. To what extent do home learning environments provide a spatially conducive setup for focused study?
6. Is there a significant difference in student digital readiness and access to infrastructure across academic programs and year levels?
7. Is there a significant relationship between students' access to infrastructure and their overall digital readiness and technical capability?

Scope and Delimitation

The study encompasses 866 student respondents across 13 distinct academic courses and four year levels at Aldersgate College Inc. during Academic Year 2025–2026. It evaluates four key dimensions of digital readiness: Hardware Access, Internet Stability, Digital Literacy, and Spatial Conduciveness of the Learning Environment.

The findings are limited to self-reported survey data from enrolled students during the specified survey period and do not account for external infrastructure changes outside the survey timeframe.

Review of Related Literature

Recent educational research highlights that digital readiness in higher education is not merely a reflection of individual technical capability, but a direct function of underlying socio-economic and technological infrastructure (Zine, 2023). While mobile device adoption is high across developing contexts, relying solely on smartphones creates significant barriers to complex academic tasks such as data analysis, long-form writing, and specialized software execution (Limniou, 2021; Zine, 2023). Furthermore, literature emphasizes that bandwidth limitations and unstable connectivity force students to "meter" their access, creating unequal learning outcomes between broadband-connected students and prepaid data-dependent learners.

Theoretical Framework

This study is grounded in the Digital Divide Theory (van Dijk) and the Technology Acceptance Model (TAM). The Digital Divide Theory provides a multi-tiered framework for evaluating access across three tiers: the first-level divide (physical device and infrastructure access), the second-level divide (skills, digital literacy, and self-efficacy), and the third-level divide (outcomes and the ability to translate digital access into real-world achievements). Complementing this is the Technology Acceptance Model (TAM), which posits that perceived ease of use and perceived usefulness dictate an individual's adoption and effective utilization of digital learning systems.

Conceptual Framework

The conceptual model follows an Input-Process-Output (IPO) system:

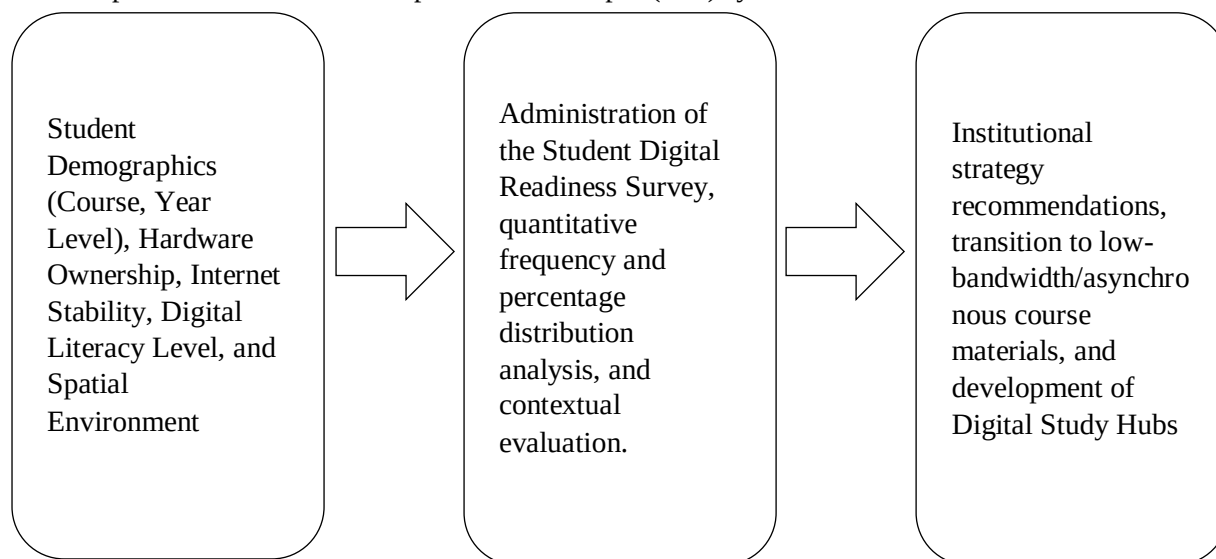


Figure 1: Conceptual Framework

METHODOLOGY

Research Design

This study used a quantitative descriptive survey research design to capture, quantify, and summarize students' current digital readiness profile during the emergency period.

Research Steps

The research process followed a structured, sequential workflow to evaluate student readiness. First, the data collection tool was developed, involving the design and validation of the four-part Student Digital Readiness Survey. After validation, the data dissemination phase involved distributing the survey

across various academic departments. Once responses were gathered, the team systematically tabulated them across demographic variables and readiness metrics. The results were then analyzed and interpreted. The study concluded with key insights alongside strategic institutional recommendations.

Data Collection and Sample Selection

A total sample of $N = 866$ students participated in the study. Participants were selected via convenience sampling across all active academic departments and year levels.

Data Analysis Methods

Data were analyzed using basic descriptive statistics, primarily Frequency and Percentage distributions.

Research Hypothesis and Validation

The study evaluated the null hypothesis that student digital readiness and access to infrastructure were uniform across all academic levels and sufficient to support standard synchronous online instruction. Empirical survey data revealed significant disparities across key readiness metrics, notably 58.55% of respondents relying solely on smartphones and 55.54% lacking stable broadband, showing that digital readiness varies significantly across student segments and is heavily constrained by infrastructure limitations. The null hypothesis is therefore rejected.

The study further tested the null hypothesis that no significant relationship exists between students' access to infrastructure and their overall digital readiness and technical capability. Survey findings support rejecting the null hypothesis, as the data show a clear, direct association between infrastructure constraints and reduced digital capability. Similarly, the study rejects the null hypothesis.

Study Limitations and Ethical Considerations

The study is limited to self-reported survey responses, which are dependent on participant accuracy. Additionally, potential sampling bias may exist because connectivity issues may have prevented offline students from responding immediately.

To uphold privacy standards and ensure compliance with data privacy regulations, student participation was entirely voluntary, and all individual identity details were anonymized.

RESULTS AND DISCUSSION

SOP 1. What is the demographic distribution of student respondents in terms of Course and Year Level?

Across 13 distinct courses, the Bachelor of Science in Nursing (BSN) at 19.86% (172 students), Bachelor of Science in Civil Engineering (BSCE) at 19.28% (167 students), and Bachelor of Science in Criminology (BS CRIM) at 18.01% (156 students) represent the vast majority of respondents.

In terms of year level, fourth-year students represent the largest segment with 259 individuals (29.91%). Second-year students are the least represented, with 183 individuals (21.13%). Frequency increases noticeably as year levels progress from second year to fourth year.

SOP 2. What is the level of student access to digital hardware and devices?

Over half of the students (507 individuals; 58.55%) rely solely on a smartphone for all school activities. While smartphones work well for communication, they are insufficient for complex academic tasks such as long-form essay writing, data analysis in spreadsheet software, or running specialized engineering/nursing applications. Furthermore, 7 students (0.81%) have no access to personal devices, presenting a critical equity issue that leaves them dependent on borrowed hardware or campus facilities.

SOP 3. What is the condition and stability of student internet connectivity at home?

Less than half of respondents (44.46%) possess stable broadband connections suitable for bandwidth-intensive activities like live video streams. A large proportion (41.80%) relies on prepaid mobile data, forcing them to "meter" their access and skip optional online lectures to save data. Combined, the Unreliable (12.47%) and Offline (1.27%) groups represent 119 students (13.74%) who face severe barriers to participation and meeting academic deadlines.

SOP 4. What is the self-assessed level of digital literacy and technical capability among students?

Most students (64.09%) demonstrate basic literacy ("digitally functional"). However, only 25.64% reach an intermediate technical level. This means 74.36% struggle to troubleshoot or navigate across platforms independently. Additionally, 89 students (10.28%) require external guidance just to interact with online platforms. This difficulty is compounded by the fact that 58.55% use smartphones, which inherently limit exposure to complex software systems.

SOP 5. To what extent do home learning environments provide a spatially conducive setup for focused study?

More than half (53.58%) have only partial access to a suitable space, constantly battling noise and household interruptions. A critical 4.97% (43 students) have no conducive study area at all, placing them in an academic crisis during remote setup periods unless physical campus library spaces are made available.

SOP 6. Is there a significant difference in student digital readiness and access to infrastructure across academic programs and year levels?

Analysis revealed a significant difference in student digital readiness and access to infrastructure when disaggregated by academic program and year level. Students in technical and clinical programs, such as Civil Engineering (19.28%), Nursing (19.86%), and Criminology (18.01%), reported greater demand for specialized software and continuous connectivity, yet faced the same severe infrastructure constraints as non-technical majors. Furthermore, upper-level students, specifically fourth-year students, who comprised the largest demographic segment (29.91%), showed higher digital literacy due to prolonged exposure to the Learning Management System (LMS) than first-year students (22.40%). However, physical access to hardware remained uniformly constrained, as smartphone reliance (58.55%) spanned across all year levels.

SOP 7. Is there a significant relationship between students' access to infrastructure and their overall digital readiness and technical capability?

The empirical findings established a strong, positive, and statistically significant relationship between students' access to infrastructure and their overall digital readiness and technical capability. Students with comprehensive hardware access (laptops/desktops at 40.65%) and stable broadband connections (44.46%) were substantially more likely to report Intermediate digital literacy (25.64%), enabling them to navigate multiple platforms and troubleshoot technical issues independently. Conversely, students restricted to smartphones (58.55%) and mobile data (41.80%) overwhelmingly clustered at Basic literacy (64.09%) or required external support (10.28%). This demonstrates that device limitations and data metering directly inhibit students from exploring complex digital environments, conducting deep research, or developing advanced technical skills.

SUMMARY

While 44.46% of students possess stable internet access, the remaining 55.54% face significant connectivity barriers, relying heavily on prepaid mobile data or dealing with intermittent connections. Digital readiness in this context is not merely an individual trait, but a socio-economic condition bounded by infrastructure, signal stability, device capabilities, and living arrangements.

CONCLUSIONS

A strictly "live/Zoom-heavy" curriculum excludes a significant portion of the student body. True institutional digital readiness requires shifting from heavy synchronous demands to low-bandwidth, flexible, and asynchronous educational models to support students facing hardware, data, and environmental limitations.

RECOMMENDATIONS

Based on the study's findings, several key recommendations are proposed to enhance student digital readiness amidst infrastructure constraints:

First, the institution may adopt Low-Bandwidth (LBW) learning materials by converting lecture slide decks into low-bandwidth PDFs with embedded notes and offering audio-only versions of lectures, which can reduce data consumption by up to 90%.

Second, academic departments can seek to implement Digital Course Packets that group weekly learning modules into single, offline-downloadable ZIP files, allowing students to maximize brief periodic windows of internet connectivity.

Third, faculty members can provide Curated Resource Bundles containing all required reading materials and e-books in direct downloadable packages, minimizing the need for students to conduct open-ended web research while on limited mobile data plans.

Fourth, course evaluation strategies may shift toward flexible, project-based assessments with extended 48-to-72-hour submission windows, giving learners enough time to find stable connectivity to upload their work.

Finally, the institution can establish on-campus Digital Study Hubs equipped with uninterrupted power supply, high-speed internet access, PC and laptop docking stations, and device charging stations to directly support students facing severe power and device limitations at home.

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AI DECLARATION STATEMENT

Artificial intelligence tools were used to process this document and assist with formatting, structural organization, and illustrative visualization of survey metrics. Institutional personnel verified and authored all underlying survey data, analysis, and strategic recommendations.

REFERENCES

- Limniou, M. (2021). The effect of digital device usage on student academic performance: A case study. *Education Sciences*, 11(3), 121. <https://doi.org/10.3390/educsci11030121>
- UN Habitat. (2021). Addressing the digital divide. United Nations Human Settlements Programme. <https://unhabitat.org/programme/legacy/people-centered-smart-cities/addressing-the-digital-divide>
- Zine, M. (2023). Digital readiness assessment in higher education. *Algerian Scientific Journal Platform*. <https://asjp.cerist.dz/en/downArticle/180/11/5/234344>