

Digital Libraries as a Socio-Technical Space for Shaping Information Access Culture: A Case Study of Thai Nguyen University of Sciences

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ABSTRACT: This study examines the formation of information access culture at Thai Nguyen University of Sciences within Vietnam's digital transformation context. Using a mixed-methods approach, the research analyzes how digital libraries function as socio-technical spaces where academic norms and user practices are negotiated. The findings reveal that while technical access is well-established—with 68.6% of respondents using the system weekly—engagement remains primarily instrumental and compliance-driven. Most usage is dictated by curricular requirements rather than autonomous curiosity. A significant "trust gap" exists, as 62.8% of users prioritize institutional databases over open-access platforms, viewing the library as a "legitimate" filter for authoritative knowledge. The paper identifies a structural tension: while the 2019 Library Law has accelerated infrastructural modernization, cultural adaptation lags behind. The study concludes that the university is in a transitional phase where digital tools are adapted to traditional study habits rather than transforming them. To move forward, institutions must prioritize user agency and critical engagement over mere resource provision.

Keywords: Digital libraries, Information access culture, Digital transformation, User behavior, Higher education

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I. INTRODUCTION

Digital libraries have become a central component of contemporary information infrastructures, reshaping how information is accessed, organized, and used within academic and social contexts. Beyond the digitization of collections, digital libraries increasingly rely on data-based services, networked platforms, and interactive systems that influence everyday information practices [1], [2], [3]. As a result, libraries are no longer only technical systems but also institutional spaces where patterns of information access are gradually formed.

Existing research suggests that the use of digital libraries cannot be explained solely by technological factors. Studies on information needs and user behavior indicate that social context, institutional settings, and culturally embedded practices significantly affect how users approach digital information environments [4], [5], [6]. At the same time, access to digital cultural resources has been associated with broader cultural participation and openness, pointing to the role of digital infrastructures in shaping shared norms and values related to information access [7]. These perspectives support the notion of an emerging information access culture within digital library environments.

In Vietnam, digital library development has been closely linked to national digital transformation agendas and the legal framework governing library activities. The promulgation of the Library Law in 2019 and the National Digital Transformation Program has accelerated the expansion of digital library systems and inter-library connectivity [8], [9]. Domestic studies have primarily addressed policy implementation and the exploitation of digital information resources [10], [11]. However, the cultural implications of digital library use, particularly how users develop habitual ways of accessing and engaging with information, have received limited analytical attention.

This study focuses on the formation of information access culture in the context of digital libraries in Vietnam. Through a case study of Thai Nguyen University of Sciences, it examines digital libraries as cultural spaces where information practices are shaped and normalized, contributing to a more context-sensitive understanding of library digitalization in Vietnamese higher education.

II. LITERATURE REVIEW

The concept of the digital library has increasingly been reframed in the literature from a purely technological artifact to a socio-technical environment in which patterns of information access, use, and valuation are gradually shaped. Borgman's foundational and recent works argue that digital libraries function as knowledge

infrastructures whose influence extends beyond storage and retrieval, affecting how academic communities define legitimate information, authority, and reuse practices [1], [9]. From this viewpoint, the emergence of an information access culture is inseparable from institutional settings and user communities in which digital libraries are embedded.

Empirical studies on information needs and user engagement further illustrate this cultural dimension. Research conducted in research and academic institutions shows that users approach digital libraries with expectations rooted in disciplinary norms, learning habits, and prior exposure to digital resources, rather than responding uniformly to system functionalities [1], [3]. These findings are reinforced by recent systematic reviews, which indicate that personalization and user-centered design in digital libraries often remain technically driven, while the cultural logic guiding users' information-seeking behavior receives limited attention [6]. Such evidence suggests that the formation of information access culture is a negotiated process between users and institutional infrastructures, not a direct outcome of digitalization.

The evolution of digital libraries, often described through successive models from Library 2.0 to Library 5.0, provides another analytical lens. Rather than representing linear technological progress, these stages reflect changing assumptions about user participation, collaboration, and agency in information environments [2]. In higher education contexts, these shifts imply a gradual reconfiguration of how students and faculty perceive access, ownership, and legitimacy of digital information, contributing to the emergence of shared access norms within universities.

Insights from studies on digital cultural access broaden this discussion by situating digital libraries within wider processes of cultural openness. Evidence from cross-national research demonstrates that access to digital cultural resources can foster more inclusive and participatory attitudes toward knowledge and information [7]. Applied to university libraries, this perspective highlights their role as mediating spaces where digital access practices intersect with academic culture, learning traditions, and social values.

In the Vietnamese context, the development of digital libraries has been strongly shaped by national policy frameworks. The 2019 Library Law and the National Digital Transformation Program articulate strategic goals of modernization, connectivity, and expanded access to digital information resources [8], [9]. Domestic scholarship has critically examined the implementation of these policies, identifying both opportunities and institutional constraints in building digital library systems [10], [11]. However, existing studies tend to focus on legal, technical, or managerial dimensions, leaving the cultural consequences of digital library adoption underexplored. This gap points to the need for case-based investigations, such as at Thai Nguyen University of Sciences, to understand how digital libraries actively contribute to the formation of information access culture within Vietnamese higher education institutions.

III. METHODOLOGY

Research design

This study adopts a mixed-methods research design, with qualitative inquiry serving as the analytical core and quantitative data playing a complementary, supportive role. The methodological choice reflects the research objective: to examine not only patterns of digital library use, but also the underlying meanings, norms, and perceptions through which information access culture is formed within a university context.

Rather than treating digital library usage as a measurable technical behavior alone, the study approaches it as a culturally embedded practice shaped by institutional routines, academic expectations, and users' prior experiences with digital information environments. A case study strategy was therefore selected, allowing for an in-depth examination of these dynamics at Thai Nguyen University of Sciences.

Research site and participants

The research was conducted at Thai Nguyen University of Sciences, a multidisciplinary public university that has actively implemented digital library services as part of Vietnam's national digital transformation agenda. Two groups of participants were involved:

Quantitative sample (n = 258): undergraduate and postgraduate students, along with academic staff, who regularly use or have access to the university's digital library system.

Qualitative sample (N = 31): purposively selected participants, including librarians, faculty members, and students, chosen based on their level of engagement with digital information resources and their ability to provide reflective insights into information access practices.

This combination ensured both breadth of coverage and depth of understanding, while maintaining coherence with the study's cultural and interpretive orientation.

Data collection methods

Quantitative data were collected through a structured questionnaire designed to capture patterns of digital library use, frequency of access, perceived usefulness, and general attitudes toward digital information resources.

The survey results were used primarily to contextualize user practices and to identify dominant trends within the university community.

Qualitative data were obtained through semi-structured interviews, allowing participants to articulate their experiences, expectations, and interpretations of digital library use in their own terms. Interview questions focused on issues such as perceptions of access, trust in digital sources, changes in study or research habits, and the perceived role of the digital library in academic life. This qualitative component was central to uncovering how information access culture is negotiated and internalized.

Data analysis

Quantitative data were analyzed using descriptive statistical techniques to provide an overview of usage patterns and user characteristics. These findings were not treated as explanatory in themselves, but as an empirical backdrop for qualitative interpretation.

Qualitative data were analyzed thematically, following an iterative coding process. Attention was given to recurring meanings, implicit norms, and value-laden expressions related to information access. The analysis emphasized how digital library practices are embedded in academic culture, rather than isolating them as purely individual behaviors.

Ethical considerations

All participants were informed of the research purpose and provided voluntary consent prior to participation. Anonymity and confidentiality were ensured throughout data collection and analysis, and the study adhered to ethical standards applicable to social science research in higher education contexts.

IV. RESULTS AND DISCUSSION

4.1. Patterns of digital library access

Quantitative findings indicate that digital library access has become a routine academic practice at Thai Nguyen University of Sciences, though with uneven depth of engagement. A majority of respondents (68.6%) reported accessing the digital library at least once a week, primarily for course-related materials and academic assignments. However, only 27.1% indicated regular use for independent research or exploratory learning beyond curriculum requirements.

Table 1. Frequency and purpose of digital library use (n = 258)

Purpose of access	Frequent use (≥ weekly)	Occasional use (monthly)	Rare use (< monthly)
Course-related learning	54.3%	33.7%	12.0%
Assignment completion	49.6%	38.4%	12.0%
Research / thesis work	21.7%	42.6%	35.7%
Self-directed learning	18.2%	36.8%	45.0%
Cultural / interdisciplinary use	11.6%	29.4%	59.0%

Notes: Percentages are calculated within each purpose category; totals may not equal 100% due to rounding.

Source: Author's survey, 2025

The table shows a clear concentration of frequent digital library use in activities directly tied to curricular obligations. More than half of respondents reported weekly use for course-related learning (54.3%) and assignment completion (49.6%). These figures suggest that digital library access is firmly embedded in formal teaching and assessment structures, where usage is often externally motivated by course requirements rather than internally driven by intellectual curiosity.

By contrast, activities associated with deeper knowledge engagement—such as research, self-directed learning, and cultural or interdisciplinary exploration—display markedly lower levels of frequent use. In particular, cultural and interdisciplinary access registers the highest proportion of rare use (59.0%), indicating that the digital library is seldom perceived as a space for broader cultural inquiry. This pattern points to a functional narrowing of digital library use, where access is largely instrumental and task-oriented.

From a cultural perspective, these findings are significant. They suggest that while technical access to digital resources is widely available, the culture of information access remains closely aligned with compliance-based academic behavior. Users tend to approach the digital library as a tool for fulfilling immediate academic demands rather than as an environment for autonomous exploration or cultural enrichment. This observation aligns with previous research emphasizing that digital availability does not automatically foster diversified or reflective information practices [4], [6].

Moreover, the dominance of occasional use in research-related activities (42.6%) implies a transitional stage in which users recognize the relevance of digital libraries for scholarly work but have not yet fully integrated them into sustained research routines. In this sense, digital library access at the university reflects an ongoing

cultural negotiation between traditional study habits and emerging digital practices, rather than a completed transformation.

Taken together, the results highlight a central issue addressed by this study: the gap between institutional digitalization and the internalization of digital access as a cultural practice. The digital library functions efficiently as an academic support system, yet its potential role in shaping a broader culture of information engagement remains only partially realized.

4.2. Digital library as a cultural space of access

Qualitative interviews reveal that users do not perceive the digital library merely as a technical system for information retrieval, but as an institutional space governed by implicit academic norms and expectations. For many participants, particularly undergraduate students, the digital library was consistently associated with “official,” “safe,” or “legitimate” academic knowledge. In contrast, informal or open digital sources - despite being widely accessible - were often framed as supplementary or secondary, to be consulted only after institutional resources had been exhausted.

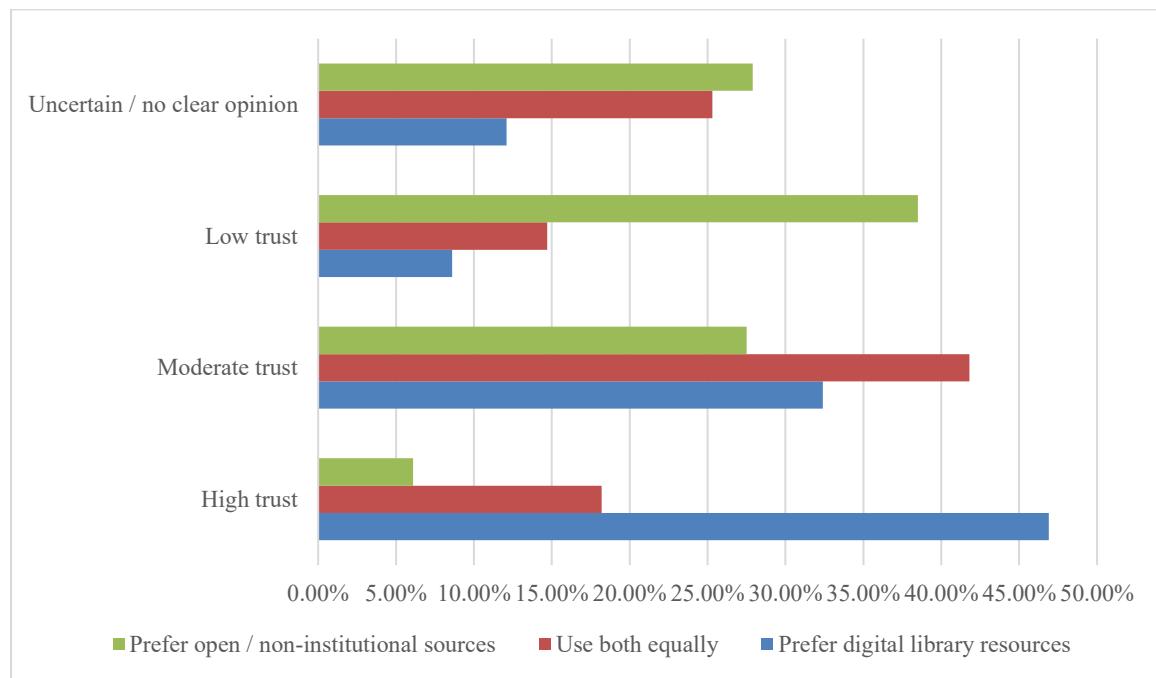


Figure 1. Trust in digital information sources by access preference (n = 258)

Source: Author's survey, 2025

This perception is reinforced by quantitative findings. Survey data indicate that 62,8% of respondents reported a higher level of trust in digital resources provided through the university library compared to open-access platforms or general online sources. Moreover, 57,3% stated that they would prioritize library-provided databases even when alternative sources were easier to access. These figures suggest that legitimacy in information access is not determined solely by availability or usability, but is culturally embedded within institutional affiliations. Such patterns reflect Borgman's argument that digital libraries function as boundary-setting infrastructures, delineating what counts as authoritative knowledge within academic environments [1], [3]. In this sense, the digital library actively contributes to the formation of a shared culture of access, where trust, academic value, and informational legitimacy are collectively negotiated rather than technically prescribed. Access is thus not a neutral act, but one shaped by institutional symbols and academic socialization. A recurring theme in interviews was a cautious attitude toward unfamiliar or non-institutional digital resources, even when technical access was unrestricted. Several participants expressed uncertainty regarding the academic credibility of open digital materials, indicating that prior learning experiences and assessment practices strongly condition how digital access is enacted. This finding aligns with survey results showing that 48,5% of users avoided exploring unfamiliar digital collections unless explicitly recommended by lecturers or librarians.

From a cultural perspective, this cautiousness reflects a form of learned academic *habitus*, where conformity to institutional expectations outweighs exploratory engagement. The digital library, therefore, operates simultaneously as a gateway to information and as a cultural filter that stabilizes conventional patterns of academic

behavior. While this reinforces trust and quality assurance, it may also limit the development of more autonomous and critically engaged information practices.

Within the context of Vietnam's digital transformation, these findings highlight a central tension addressed by this study. Although digital libraries expand technical access, their cultural role remains closely aligned with existing academic hierarchies and pedagogical traditions. As a result, the formation of information access culture at Thai Nguyen University of Sciences reflects continuity as much as change, underscoring the need to examine digital libraries not only as technological infrastructures but as cultural institutions that actively shape how knowledge is accessed, valued, and legitimized in higher education.

4.3. Information access culture and user agency

The transition from earlier models of digital libraries toward more participatory and user-centered paradigms is frequently framed in the literature as an expansion of user agency. Concepts such as Library 3.0, 4.0, and more recently Library 5.0 emphasize interaction, personalization, and co-creation of knowledge environments [2]. Implicit in these frameworks is the assumption that users will gradually reposition themselves from passive recipients of information to active agents who shape, evaluate, and even contribute to digital knowledge spaces.

Findings from this case study suggest that such a transformation remains incomplete within the examined institutional context. Although respondents consistently acknowledged the efficiency, convenience, and accessibility of the digital library system, most did not conceptualize their role beyond that of information consumers. Digital access was largely interpreted as a service provided by the institution, rather than as a space inviting participation, experimentation, or intellectual initiative.

This limited expression of user agency is not merely an individual matter, but reflects deeper cultural and institutional conditions. Interviews indicate that academic expectations continue to privilege compliance with curricular requirements, standardized assessment, and prescribed reading lists. Within such a framework, exploratory or self-directed engagement with digital resources tends to be perceived as secondary, optional, or even peripheral to "legitimate" academic work. As a result, the cultural horizon within which digital libraries operate remains narrowly defined. The relationship between technology and practice observed in this study can be analytically represented as follows:

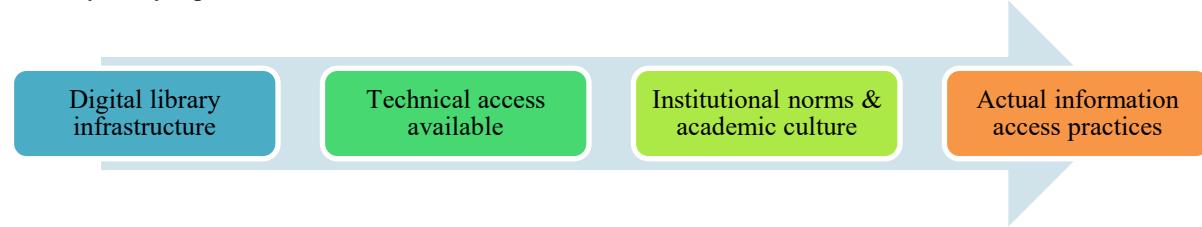


Figure 2. Relationship between digital library infrastructure, institutional norms, and information access practices

Source: Author's survey, 2025

Rather than functioning as a linear chain, this structure illustrates a filtering process. Technical access, while necessary, does not directly translate into transformed practices. Institutional norms—embedded in teaching methods, evaluation systems, and disciplinary traditions—mediate how digital resources are perceived and used. User agency, in this sense, is shaped less by system capabilities than by the cultural logic of the academic environment.

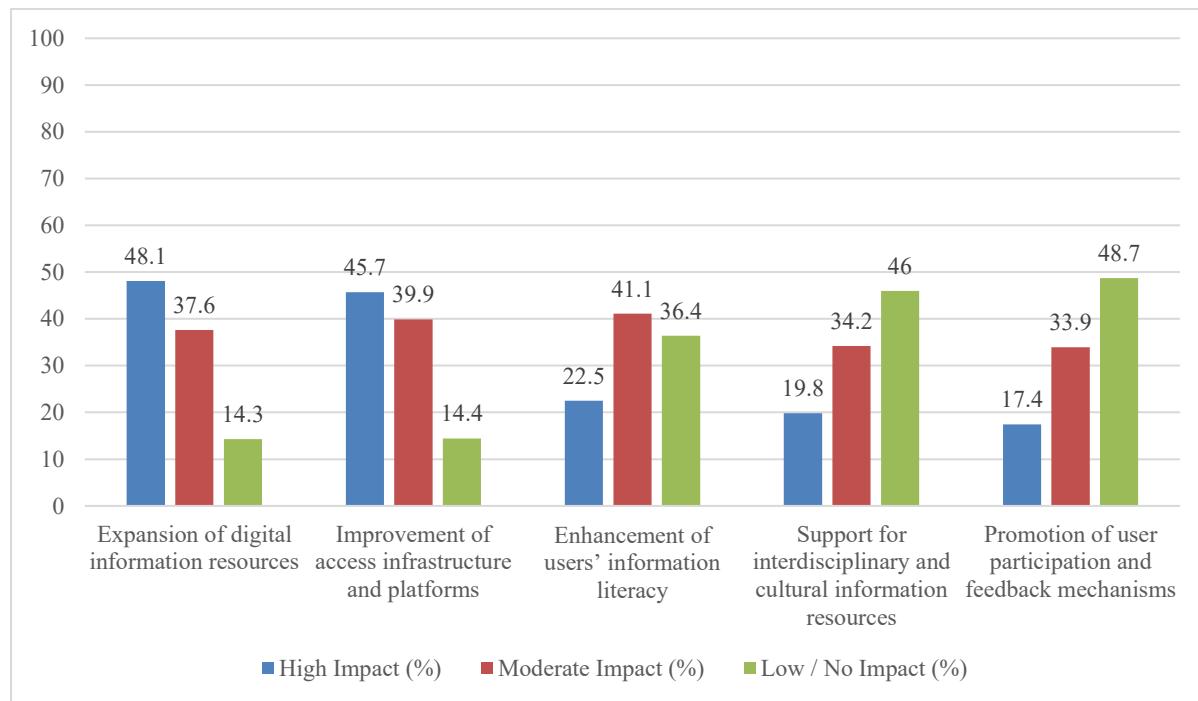
This finding complicates optimistic narratives that equate digitalization with empowerment. In the studied context, digital libraries expand access without fundamentally altering dominant patterns of knowledge engagement. Users adapt digital tools to existing habits, instead of reconfiguring those habits in response to digital possibilities. Such adaptation signals a form of cultural continuity rather than disruption. From a cultural-analytical perspective, the formation of information access culture thus appears as a gradual and contested process, not a technological outcome. Agency emerges only where institutional structures actively encourage interpretive freedom, critical information practices, and intellectual autonomy. Without such conditions, digital libraries risk reinforcing passive modes of access, despite their advanced technical features.

This interpretation aligns with broader critiques in digital library studies, which caution against conflating user-centered design with genuine user agency [1], [3]. The case of Thai Nguyen University of Sciences demonstrates that the cultural dimensions of digital transformation demand sustained pedagogical and institutional engagement, beyond the provision of access and infrastructure alone.

4.4. Policy frameworks and local implementation

At the macro level, Vietnam's Library Law (2019) and the National digital transformation program to 2025, with a vision to 2030, establish a relatively comprehensive legal and strategic framework for the development of digital libraries in higher education institutions [8], [9]. These documents emphasize

modernization of library services, expansion of digital resources, and the integration of information technologies into academic environments. From an institutional perspective, Thai Nguyen University of Sciences has actively aligned its digital library development with these policy orientations. Quantitative data, however, reveal a differentiated perception of policy impact among users. While respondents largely acknowledged the positive effects of national policies on technical and infrastructural aspects, evaluations became less favorable when policies were associated with cultural and human-centered dimensions of information access.



Notes: Percentages are calculated within trust categories; totals may not equal 100% due to rounding.

Figure 3. Perceived impact of national digital library policies on institutional practices (n = 258)

Source: Author's survey, 2025

The table indicates a clear imbalance in policy realization at the institutional level. Measures related to resource expansion and technical access received the highest proportion of “high impact” responses, suggesting that policy objectives in these areas are relatively visible and tangible to users. In contrast, aspects that directly contribute to the formation of an information access culture—such as information literacy, interdisciplinary openness, and user participation—were predominantly rated as having moderate or low impact.

Qualitative interviews with librarians and faculty members help explain this discrepancy. Policy implementation, as described by institutional actors, is often operationalized through indicators that prioritize system deployment, database subscriptions, and platform connectivity. Cultural dimensions, including the cultivation of critical information practices or the encouragement of exploratory and participatory use of digital resources, tend to be treated as secondary or implicit outcomes rather than explicit targets.

This pattern reflects what domestic scholars have identified as a technocratic bias in digital library development under the current legal framework [10], [11]. While national policies provide strategic direction, their translation into institutional practice remains largely infrastructure-driven. As a result, digital libraries function efficiently as access systems but less effectively as cultural environments that foster autonomous, reflective, and culturally informed information use.

From the perspective of information access culture, this finding is significant. It suggests that the policy framework, although supportive in principle, does not automatically generate cultural change. Instead, the formation of information access culture requires deliberate institutional mediation, where policy goals are reinterpreted through pedagogical practices, user education, and everyday academic routines. Without such mediation, digital transformation risks reinforcing compliance-oriented access rather than enabling deeper cultural appropriation of digital information resources.

4.5. Discussion: Identifying the core issue

Taken together, the findings indicate that the central challenge is not the lack of digital library access, but the incomplete formation of a mature information access culture. Digital libraries at Thai Nguyen University of Sciences function effectively as academic infrastructures, yet their cultural role remains underdeveloped.

Access practices are largely compliance-driven and curriculum-bound, reflecting a transitional stage in which digitalization outpaces cultural adaptation. This condition mirrors broader international concerns that digital libraries risk becoming efficient delivery systems without fully realizing their potential as inclusive cultural and intellectual spaces [7], [12].

Table 2. Qualitative themes on information access culture in the digital library (n = 31)

Analytical Theme	Description	Representative Participant Statements
Instrumental access orientation	Digital library use is driven mainly by course requirements and assessment	“I use the digital library mostly when lecturers require academic sources.”
Perceived legitimacy of resources	Preference for officially provided digital resources over open platforms	“If it comes from the library system, I trust it more than online sources.”
Limited exploratory practices	Low tendency to browse beyond assigned materials	“I rarely explore topics unless they are related to my coursework.”
Passive user role	Users see themselves as consumers rather than contributors	“The library provides, we just use what is available.”
Cultural transition in progress	Awareness of change without full internalization	“Digital access is convenient, but habits have not changed much.”

Source: Author's survey, 2025

The qualitative analysis indicates that the information access culture at Thai Nguyen University of Sciences is best understood as being in a transitional phase. Participants generally demonstrate a clear awareness of the advantages offered by digital library systems, particularly in terms of convenience, efficiency, and institutional legitimacy. However, this awareness has not yet translated into a substantive transformation of information practices. Instead, digital library use continues to be shaped largely by compliance-oriented behaviors, closely aligned with curricular requirements, assessment demands, and formal academic expectations.

In this context, access to digital information has not been fully internalized as an intrinsic academic or cultural value. Rather than functioning as a space for intellectual exploration, critical inquiry, or interdisciplinary engagement, the digital library is predominantly approached as a functional tool for meeting predefined academic obligations. Such patterns suggest that users' engagement with digital resources remains externally regulated, with limited evidence of autonomous or self-directed appropriation of information. The persistence of passive access practices reflects deeper institutional and pedagogical norms that continue to prioritize conformity and efficiency over exploratory knowledge production.

When these findings are situated within the broader body of international scholarship on digital libraries and user behavior, as well as within Vietnam's current policy framework on digital transformation, a structural tension becomes apparent. While national policies and institutional strategies have successfully expanded digital infrastructure and resource availability, cultural adaptation has progressed at a slower pace. This disjunction highlights the need to reconceptualize digital libraries not merely as technological solutions or service platforms, but as cultural institutions that actively shape how knowledge is accessed, evaluated, and internalized within higher education environments. Without deliberate efforts to address this cultural dimension, digital transformation risks remaining superficial, reinforcing established academic routines rather than fostering more reflective, participatory, and culturally embedded forms of information engagement.

V. CONCLUSION

This study has examined digital libraries not simply as technological infrastructures, but as cultural environments in which information access practices are formed, stabilized, and contested. Through a case study of Thai Nguyen University of Sciences, the findings demonstrate that the expansion of digital library systems in Vietnam has successfully normalized technical access to academic information, yet has not fully translated into the internalization of information access as a shared academic and cultural value.

Empirical evidence indicates that digital library use remains predominantly instrumental and compliance-oriented, closely tied to curricular requirements and assessment structures. While users recognize the legitimacy and efficiency of institutional digital resources, their engagement is largely confined to predefined academic tasks, with limited inclination toward exploratory, self-directed, or interdisciplinary information practices. This pattern suggests that digital transformation in higher education has progressed faster at the infrastructural level than at the level of cultural adaptation.

By situating these findings within both international scholarship and Vietnam's policy framework, the study highlights a critical gap between policy-driven digitalization and the lived realities of information use in academic settings. National strategies and legal instruments have created favorable conditions for digital library development, yet their cultural implications remain underarticulated in institutional implementation. As a result,

digital libraries risk functioning as efficient service systems rather than as active cultural institutions capable of shaping reflective and participatory knowledge practices.

The study contributes to the literature by foregrounding the concept of information access culture as a necessary analytical lens for understanding digital libraries in transitional contexts. It underscores the importance of moving beyond metrics of access and usage toward a more nuanced consideration of how digital resources are culturally appropriated within universities. Future efforts in digital library development, particularly in Vietnam and similar contexts, would benefit from integrating cultural, pedagogical, and institutional strategies that encourage critical engagement and user agency alongside continued technological advancement.

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