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Digital Literacy of Vietnamese Academic Librarians

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Abstract
This paper reveals the findings of a study that examined the digital literacy of Vietnamese academic librarians and the factors that affect their digital literacy. A survey research method was employed to gather data from academic librarians in Vietnam, based on UNESCO's Digital Literacy Global Framework. The results indicated that the digital literacy of the academic librarians surveyed exceeded the intermediate level, but various competence areas needed improvement. The study suggests a range of factors to consider, from individual and organisational aspects to the broader socio-economic setting when developing digital literacy for academic librarians.

Keywords: Digital literacy; Academic librarians; Vietnam

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1.0 Introduction

Vietnam is undergoing a major digital transformation following the Prime Minister's approval of two national programmes: one for general digital transformation (Decision No. 749/QD-TTg, 2020) and another for the library sector (Decision No. 206/QD-TTg, 2021) (Prime Minister of Vietnam, 2020, 2021). Digital transformation involves digitising the entire organisation, including implementing processes, organisational models, and methods of delivering new services (Ministry of Information and Communications, 2021). The expectation for 2025 is that every Vietnamese librarian will have access to thorough training to elevate their capabilities in modern library techniques, with a focus on digital skills as a fundamental requirement for successful evolution.According to UNESCO, "Digital literacy is the ability to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for employment, decent jobs and entrepreneurship" (Law et al., 2018, p. 6). The rise of digital literacy has created major challenges for nations, particularly developing ones like Vietnam, as the scope of this literacy now includes ethics, creativity, and critical thinking beyond just basic computer knowledge.

While there is agreement on the need to enhance library staff's digital literacy, few studies have thoroughly evaluated this using global frameworks like UNESCO's, especially in Vietnam. Most studies primarily delve into the digital skills needed for particular library tasks. This study aims to investigate digital literacy among academic librarians in Vietnam, with a focus on both current levels and

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influencing factors. To fulfil this aim, the investigation establishes the following objectives: (i) to assess the current digital literacy levels of academic librarians in Vietnam; and (ii) to identify the factors influencing Vietnamese academic librarians' digital literacy.

2.0 Literature Review

2.1 Digital literacy of academic librarians

Recent studies on digital literacy and technology readiness in academic libraries have revealed key elements for developing sustainable capacity and providing effective library services. A study examining librarians' preparedness to use artificial intelligence for enhancing sustainable development and smart library services found a significant positive effect on service delivery (Shahzad et al., 2024). The study by Hamad et al. (2024) investigated the relationship between librarians' digital skills in Jordan and their ability to provide smart information services, uncovering a strong positive association.

An earlier study conducted by Munshi et al. (2023) found that Indian librarians are adept at using e-resources and handling digital documents. However, they are not skilled in creating websites or safeguarding intellectual property. Baro et al. (2019) reported that while African librarians are skilled in database and technology use, they encounter difficulties with metadata and website creation. According to Ayoku and Okafor (2015), numerous librarians in Nigeria are adept at email and word processing yet deficient in database and web design expertise. The role of digital literacy was underscored by Hamad et al. (2021) and Khan (2020), who identified challenges such as inadequate collaboration and resources that affect technology adoption and digital skill development. Evidence suggests that even with advancements in digital literacy among librarians, there are still aspects that need improvement in today's libraries.

Earlier studies have explored what affects digital literacy among academic librarians. According to Ahmed and Rasheed (2020), extroverted librarians tend to use digital skills more effectively. Ayoku and Okafor (2015) expanded their research to consider various aspects such as employee attitudes, funding, training opportunities, facilities, and leadership involvement. Environmental and organisational factors are seen as limiting librarians' digital literacy. Baro et al. (2019) pointed out similar concerns, including insufficient funding, substandard facilities, an outdated curriculum, and a lack of support from information technology experts. Hamad et al. (2021) emphasised that insufficient library infrastructure, lack of financial backing, ineffective management strategies, and the need for digital literacy training for librarians can have harmful effects. According to Khan (2020), significant challenges include socio-economic factors, inadequate infrastructure, a shortage of skilled personnel, lack of leadership engagement, technological demands, and reluctance to adopt new technologies. Many factors contribute to the development of digital literacy in librarians, ranging from individual and organisational levels to the broader socio-economic context. This calls for a comprehensive consideration of all these factors to support the ongoing development of librarians' competencies. Previous studies have provided an overview of the digital literacy of librarians in many countries. However, there is still a lack of research assessing this form of literacy among academic librarians in Vietnam. Therefore, conducting this study is necessary.

2.2 Digital literacy frameworks

The establishment and execution of digital literacy frameworks by numerous international bodies have become crucial for enhancing and planning digital literacy. JISC (2024) and CAUL (2019) developed frameworks - six-element digital capabilities and Digital Dexterity, respectively - to enhance digital literacy, especially in higher education. Babina et al. (2022) highlight the importance of digital skills for academic librarians to meet library objectives and cater to the needs of users in the digital era. There is an opportunity to enhance this model by specifying the digital skills needed for librarians.

The European Commission's Digital Competence Framework for Citizens (DigComp), created in 2013 and revised four times, released its latest version, DigComp 2.2, in 2022 (Vuorikari et al., 2022). In 2018, UNESCO adapted the DigComp 2.0 framework to create a global citizenship-focused digital literacy framework with seven competence areas: Devices and Software Operations, Information and Data Literacy, Communication and Collaboration, Digital Content Creation, Problem-solving, Safety, Career-related Competences (Law et al., 2018). To ensure the generalisability of its digital literacy framework, UNESCO analysed data from many countries, including Vietnam. Therefore, relying on UNESCO's global framework enhances the relevance of studying the digital literacy of academic librarians in Vietnam, a topic that remains underexplored in existing literature.

3.0 Methodology

3.1 Sampling

Vietnam boasts 242 higher education institutions, comprising 175 public universities and 67 private universities (Ministry of Education and Training, 2022). Academic librarians in Southern Vietnam were surveyed using convenience sampling, due to limited time and resource constraints. A total of 139 responses were considered valid, showing the breakdown of gender, age, and education level in Table 1. The analysis emphasised institutions that were available and ready to contribute within the designated schedule. Although the study sample was not randomly selected, libraries of various types and sizes were represented.

Table 1. Demographic data

Categories		Number of participants	Percentage
Gender	Men	54	38,8

	Women	85	61,2
Age	≤ 30	38	27,3
	31-40	54	38,8
	≥ 41	47	33,9
Education level	Vocational training/College	07	5,0
	Bachelor	98	70,5
	Master/PhD	34	24,5

After dispatching open letters, 33 libraries affiliated with universities agreed to take part in the research, with 24 (72,7%) belonging to public universities and 09 (27,3%) to private ones. The use of convenience sampling, although appropriate for the exploratory nature of the study, reduces the generalisability of the findings. This limitation is acknowledged and considered during the analysis of the results.

3.2 Data collection and analysis

Using a survey research method, the study gathers data from academic librarians through a questionnaire, structured into three parts.

Part 1 - Demographics: Contains four questions designed to gather data about the workplace, gender, age, and education level.

Part 2 - Digital literacy self-assessment: Includes 64 questions that cover seven competence areas and 24 specific competences aligned with UNESCO's global digital literacy framework. Ratings range from 1 to 5, each indicating a different level of competency: (i) 1-Zero, unfamiliar, unaware, and inexperienced; (ii) 2-Foundation, limited use for simple tasks under supervision; (iii) 3-Intermediate, regular independent use for daily tasks, but lacks full proficiency or ability to customise tools; (iv) 4-Advanced, proficient, adaptable, and capable of guiding others; (v) 5-Highly specialised, solves complex tasks, integrates tools, adapts flexibly, and innovates to improve processes.

Part 3 - Factors affecting digital literacy: Comprises 12 items that concentrate on six clusters of factors: human resources, infrastructure and facilities, training programmes, mechanisms and policies, societal and economic conditions, and others. The 5-point Likert scale illustrates an increase in influence from 1 to 5: 1-No impact, 2-Little impact, 3-Moderate impact, 4-Significant impact, 5-Very significant impact.

Before the formal survey, the questionnaire underwent a trial phase with seven academic librarians. An online survey was conducted using Microsoft Forms, with a link distributed to library staff via email with the help of a liaison officer at each library.

Employing a Microsoft Excel spreadsheet, the study utilised descriptive statistics to compute frequencies, percentages, and mean values, based on data collected through a structured process, as summarised in Figure 1.

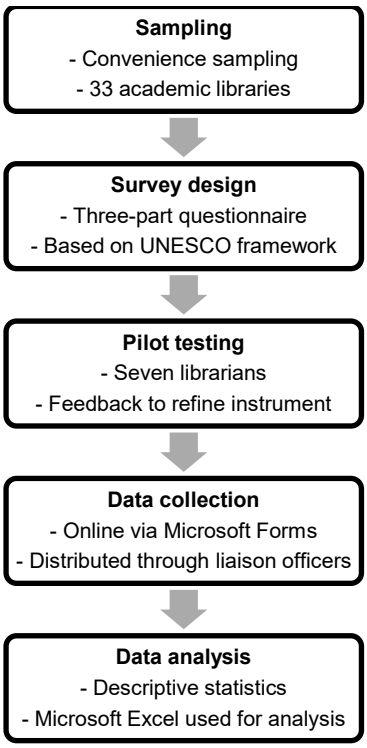

Fig. 1: Research process

4.0 Findings

4.1 Vietnamese academic librarians' digital literacy

The mean value of the digital literacy assessment allows for the identification of strengths and weaknesses in each competence area and specific competence among Vietnamese academic librarians (Table 2).

Communication and Collaboration: The survey indicates that library staff's proficiency in using digital tools for communication and collaboration is close to an advanced level, with a mean value of 3.9. Interacting through Digital Technologies reaches an advanced level, averaging at 4.3. However, Managing Digital Identity lags behind at 3.4, indicating a requirement for enhanced protection and control of personal data on the web.

Devices and Software Operations: The mean value for this competence area is 3.7, with all competences related to using digital devices and software performing above the average of 3.6. Notably, Physical Operations of Digital Devices achieves an advanced level with a mean score of 4.0.

Information and Data Literacy: The mean score for Information and Data Literacy is 3.7, mirroring Devices and Software Operations. The highest mean score of 4.0 is achieved by browsing, searching, and filtering digital content, while information evaluation and management skills receive mean values of 3.7 and 3.5, respectively.

Career-related Competences: With the mean value of this competence area being 3.6, the specific competencies related to a career such as managing digital information service and electronic information resources are all above intermediate level (mean values are 3.5 and 3.6).

Safety: The mean value for this competence area is 3.5, with Protecting Devices (mean = 3.5) and Protecting Personal Data and Privacy (mean = 3.4) being highlighted. Vietnamese academic librarians possess intermediate digital security skills, but additional instruction is necessary to enhance safeguarding measures in a progressively intricate digital landscape.

Digital Content Creation: With a mean value of 3.2, Digital Content Creation is rated as one of the weakest areas. Particularly, programming skills score a mean of 2.7, placing it below the intermediate threshold. This underscores the requirement for extra training for academic librarians in this particular area. Improving skills in copyright and licensing (mean = 3.5) and digital content development (mean = 3.4) is essential for boosting creativity and ensuring the protection of intellectual property rights.

Problem-solving: Among the two competence areas scoring the lowest mean score at 3.2, every aspect within this area highlights the need for improvement across the board.

Table 2. Mean values of academic librarians' digital literacy

Competence areas and competences	Mean
(1) Communication and collaboration	**3.9**
Interacting through digital technologies	4.3
Sharing through digital technologies	3.9
Collaborating through digital technologies	3.8
Managing digital identity	3.4
(2) Devices and software operations	**3.7**
Physical operations of digital devices	4.0
Software operations in digital devices	3.6
Evaluating technology	3.6
Selecting technology	3.6
(3) Information and data literacy	**3.7**
Browsing, searching and filtering data, information and digital content	4.0
Evaluating data, information and digital content	3.7
Managing data, information and digital content	3.5
(4) Career-related competences	**3.6**
Managing digital information services	3.6
Managing electronic information resources	3.5
(5) Safety	**3.5**
Protecting devices	3.5
Protecting personal data and privacy	3.4
(6) Digital content creation	**3.2**
Copyright and licences	3.5
Developing digital content	3.4
Integrating and re-elaborating digital content	3.3
Programming	2.7
(7) Problem-solving	**3.2**
Identifying digital competence gaps	3.5
Solving technical problems	3.2
Identifying needs and technological responses	3.2
Creatively using digital technologies	3.1

The self-assessment results of digital literacy among academic librarians display a varied distribution across all competency levels (Figure 2). The greater part of the participants evaluated their digital literacy as "Intermediate" or "Advanced" across various areas. Communication and Collaboration receives the most “Highly specialised” ratings at 24,9%, with Devices and Software Operations

leading in “Advanced” ratings at 46,3%. In contrast to the other competence areas, Digital Content Creation and Problem-solving have higher percentages of "Zero" and "Foundation" ratings, totalling 24,1% and 22,9%, respectively.

In line with the first research objective, the data show that the digital literacy of academic librarians in Vietnam surpasses the intermediate level, with a mean score of 3.5, illustrating adeptness in handling daily work duties through digital technologies. Nonetheless, there are still some areas that require more emphasis, particularly digital content creation and problem-solving. The focus of training should be on fostering a well-rounded technological proficiency in academic librarians.

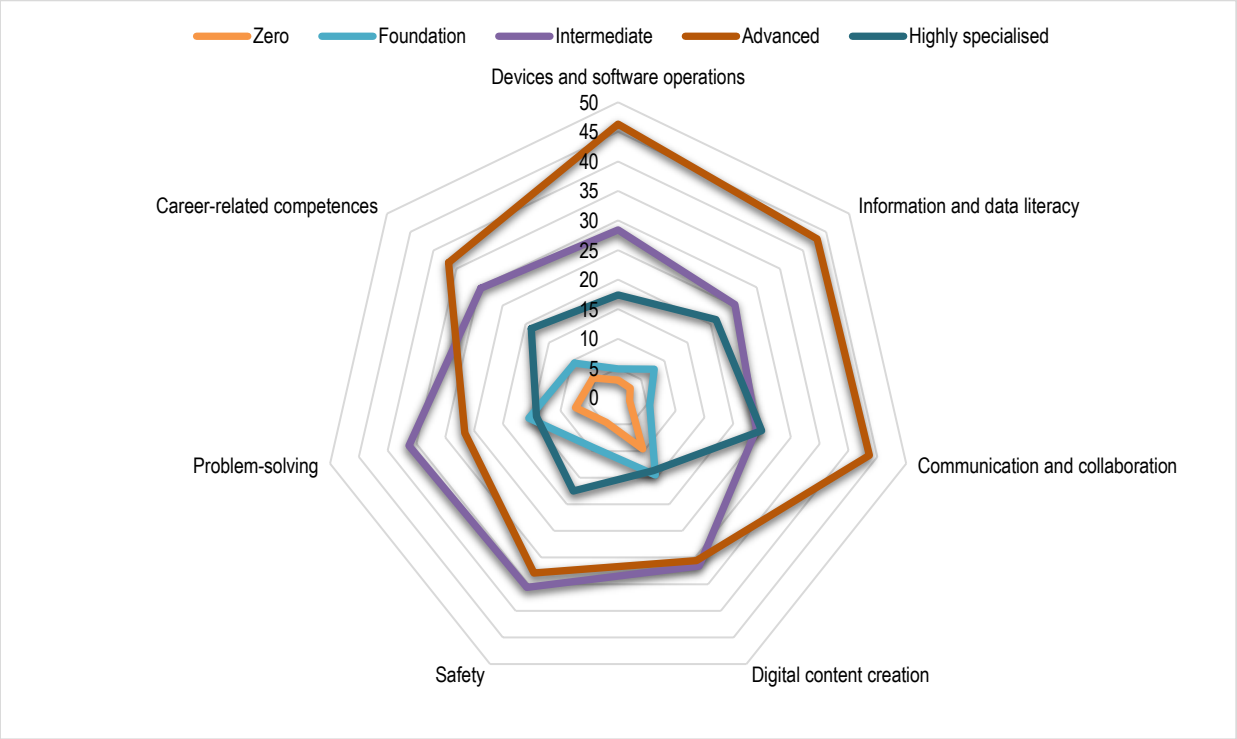

Fig. 2: Percentage of academic librarians self-assessing their digital literacy across five different levels

4.2 Factors affecting the digital literacy of Vietnamese academic librarians

The survey indicates that academic librarians' digital literacy varies by gender, age, and education, with most scores remaining above intermediate levels. According to Table 3, male academic librarians aged 41 and older with vocational or college degrees show greater digital literacy. Surprisingly, librarians with vocational or associate degrees demonstrate higher digital skills than those holding advanced degrees like bachelor's, master's, or doctoral qualifications. This can be understood by considering that librarians with vocational or college education tend to handle tasks that are more skill-demanding, which contributes to their higher proficiency level.

The difference suggests that factors like gender, age, and education may influence the digital literacy of academic librarians in Vietnam. Male librarians may have had superior digital skills compared to their female counterparts. The growth of digital skills in people of different ages appears to be influenced by their previous experiences. Variations in digital literacy among academic librarians may stem from the distinct responsibilities linked to their educational backgrounds.

Table 3. Academic librarians' digital literacy compared among different genders, ages, and education categories

Categories		Mean	Competency level (%)				
			Zero	Foundation	Intermediate	Advanced	Highly specialised
Gender	Men	3.7	1,8	7,1	21,8	42,4	26,9
	Women	3.3	6,5	10,6	33	36,9	13
Age	≤ 30	3.5	3,1	11,1	28,2	39,1	18,5
	31-40	3.4	3,7	10,9	30,6	37,5	17,3
	≥ 41	3.7	6,9	5,9	26,9	40,8	19,5
Education level	Vocational training/College	3.8	1,8	2,0	6,5	52	37,7
	Bachelor	3.2	5,6	10,7	31	37,9	14,8
	Master/PhD	3.6	2,4	6,7	26,6	39,7	24,6

The results show that many participants acknowledge the significant impact of various factors, such as human resources, infrastructure, training programmes, policies, and socio-economic conditions, on the digital literacy of academic librarians in Vietnam (Figure 3). The significance of human resources is underscored, with a cumulative rating of 77% for both significant and very significant impacts, emphasising the need for a well-trained workforce and the growth potential of academic librarians. The consensus among 72% of the participants pointed to the significant and very significant impacts of the infrastructure and facilities factor, underscoring the need

for access to modern tools and facilities. Socio-economic elements play a crucial role in shaping digital literacy, with a substantial 69,7% impact from the significant and very significant levels, highlighting the importance of the economic and social setting for Vietnamese academic librarians. The second research objective is addressed here through the identification of factors influencing the development of academic librarians' digital literacy. Although mechanisms, policies, and training programmes receive lower evaluation scores, they still play a crucial role in shaping the digital literacy of academic librarians. The participants in the study noted that the digital literacy of Vietnamese academic librarians is influenced by factors like librarians' health, technology preferences, work environment, technology trends, and leadership vision.

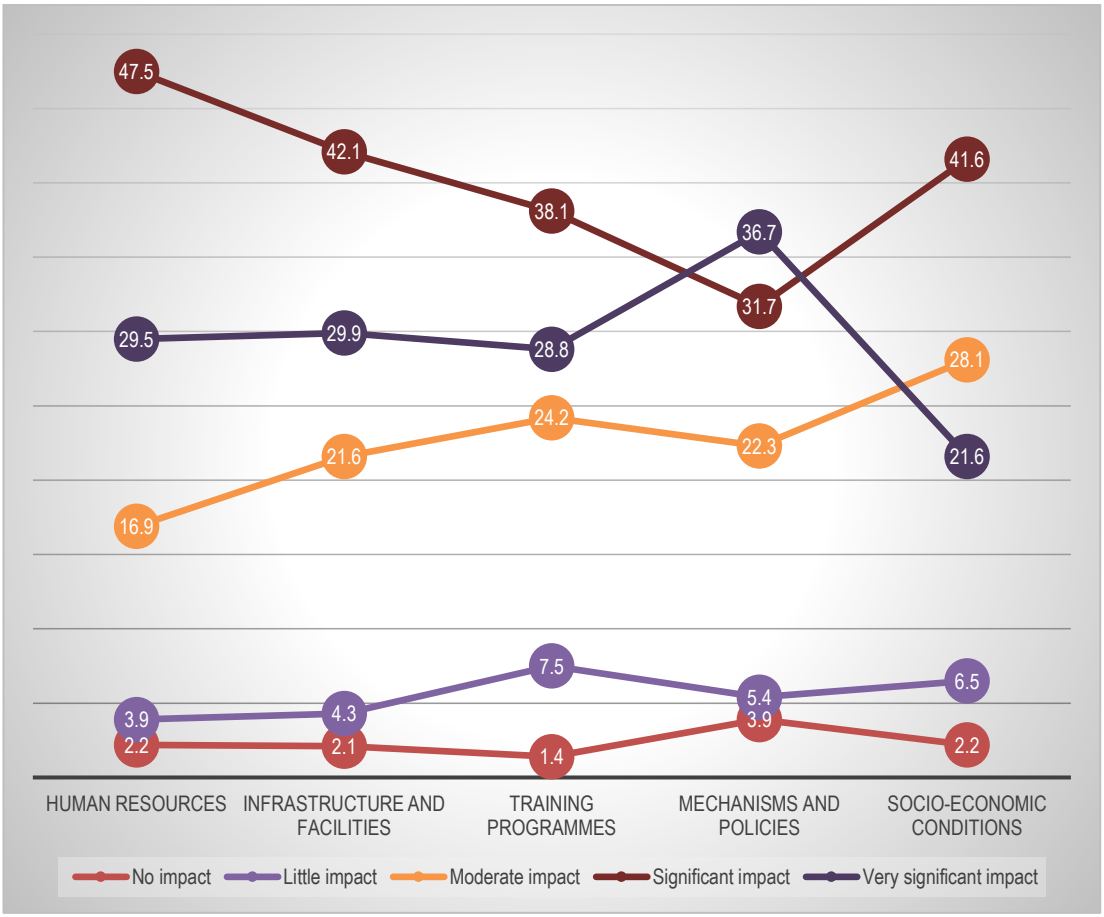

Fig. 3: Factors affecting the digital literacy of academic librarians in Vietnam

5.0 Discussion

This study demonstrated the ability of Vietnamese academic librarians to use technology in performing work-related tasks. Vietnamese academic librarians possess digital skills that exceed the intermediate level but require further enhancement. In line with the research conducted by Munshi et al. (2023), Baro et al. (2019), and Ayoku and Okafor (2015), academic librarians possess proficiency in certain digital skills. However, there are still issues that need to be addressed. This study reveals that Vietnamese academic librarians have less proficiency in digital content creation and problem-solving, especially in programming, compared to other skills. Similarly, research from India and Africa reveals that library staff still find it difficult to gain expertise in programming, web design, and digital rights management (Baro et al., 2019; Munshi et al., 2023). This indicates that enhancing the digital literacy of academic librarians in Vietnam is essential to meet the demands of digital transformation. Implementing training programmes to enhance digital literacy in academic librarians is essential for improving efficiency and service quality in libraries. Vietnamese academic librarians face challenges similar to those in developing nations, particularly in digital content creation and technical troubleshooting, when compared to global contexts. Unique challenges in Vietnam arise from uneven infrastructure, regional differences in training availability, and limited enforcement of national policies, warranting increased policy-level consideration.

This study reinforces the importance of factors affecting the digital literacy of academic librarians, such as human resources, infrastructure, training programmes, policies, and socio-economic conditions, by referencing previous research from Hamad et al. (2021), Khan (2020), Baro et al. (2019), and Ayoku and Okafor (2015). The development of digital literacy among academic librarians in Vietnam considers factors such as gender, age, and educational background. These factors contribute to the findings of Ahmed and Rasheed (2020), which identified that personality traits also influence librarians' digital skills. This study distinguishes itself by exploring not just demographic elements like gender, age, and educational background, but also factors such as librarians' health, technology preferences,

work settings, technology trends, and leadership vision, which previous research has overlooked. The development of digital literacy for Vietnamese academic librarians will be facilitated by adjusting policies, improving facilities, building a professional team, enhancing the quality of training, addressing the individual needs of each librarian, and taking advantage of economic and social opportunities. These insights could also benefit digital literacy programmes in various sectors like education, public administration, and archives, beyond just academic libraries. Future studies might investigate how specific interventions in these areas support national digital transformation objectives.

6.0 Conclusion

The study examined digital literacy and its influencing factors among Vietnamese academic librarians during the digital transformation. The digital literacy of academic librarians requires improvement, particularly in the area of digital content creation and problem-solving. This study emphasises the importance of evaluating academic librarians' digital literacy using UNESCO's Global Framework, a topic that has been overlooked in earlier research. This research highlights the significance of advancing training and continuous education for academic librarians, factoring in individual, institutional, and socio-economic influences. Strategies may involve hands-on technology training, integrating essential digital skills into professional growth, and establishing supportive policies within institutions. Improving digital literacy is crucial for effectively providing library services and ensuring the long-term development of academic libraries in Vietnam amid digital transformation.

This study has some limitations in terms of spatial scope, reliance on self-assessment tools and the use of simple data analysis techniques. This does not allow for the exploration of complex relationships between variables. These limitations may affect the validity and generalisability of the findings. Self-assessment may cause misjudgements about abilities, a concern that future studies could resolve by incorporating objective data or feedback from peers. Upcoming research might examine the influence of leadership on digital literacy and analyse cross-national differences in this form of literacy.

Paper Contribution to Related Field of Study

The article's discoveries enhance digital literacy research theory. This study's essential component is to assess academic librarians' digital literacy using UNESCO's Digital Literacy Global Framework, a topic lacking sufficient exploration in past studies. The study also introduces several elements, primarily concerning personal and institutional factors, that impact the digital literacy of academic librarians. Moreover, the study sheds light on the digital literacy of academic librarians amidst Vietnam's digital transformation, a topic often overlooked in academic literature.

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