

**Academic Information Management in the Fifth Industrial Revolution: Faculty of Education Students' Perceived effectiveness, Preferences, and Willingness**

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**Abstract**

This study investigated Faculty of Education students' perceived effectiveness, preferences, and willingness to adopt digital and non-digital information sources for academic information management in the fifth industrial revolution. Guided by three research objectives and four hypotheses, the study employed descriptive survey and correlational design and a 550-sample size from the Faculty of Education, University of Port Harcourt. Data were collected using a questionnaire titled Students' Perceived Effectiveness, Preference, and Willingness to Use Digital Tools, Non-Digital Resources or Both for Academic Information Management in the Fifth Industrial Revolution (SPEPWDNDBAIM5IR), which has a 0.80 alpha reliability index. The researchers analyzed research data using frequency and percentage and tested the hypotheses in SPSS using Chi-square and Spearman rho correlation. Findings revealed that most Faculty of Education students (59.1%) perceived combined digital and non-digital resources as most effective, while 60.9% preferred and 55.5% were willing to use such combined information sources for academic information management in the 5IR. A Significant gender-based association exists between perceived effectiveness, preferences, and a willingness to use various information sources, with male students inclining to digital tools and female students inclining to the combined sources. Significant positive correlations existed among the three variables. These results affirm the relevance of hybrid information strategies in teacher education and support the 5IR's call for balanced, sustainable, and inclusive learning environments.

**Keywords:** Fifth industrial revolution, academic information management, digital tools, non-digital resources, hybrid learning resources, education 5.0, teacher education, gender differences

## **Introduction**

From time to time, the world experiences different revolutions as techniques and technology advance to disrupt conventional economic activities. From the agrarian period to the first, second, third, and fourth Industrial Revolutions, which respectively depended on steam engines, electrification, electronics and computer automation, and digitalization, different economic sectors, including the education sector, always readjusted their activities to accommodate and meet the time demands. Therefore, the emergence of the fifth Industrial Revolution (5IR) should necessitate educators, especially in developing countries like Nigeria, to rethink how they prepare students for effective information management to properly align with global change since education is the variable instrument for any societal demands and change implementation. Rethinking education to incorporate effective information management strategies among trainee teachers remains mandatory for 5IR. Al-Emran and Al-Sharaf (2022) averred that 5IR can alter how teachers and learners approach teaching and learning for greater efficiency.

The 5IR or Industry 5.0 refocused the world's attention on the value of human involvement in the industrial processes for increased well-being and societal sustainability. It is an advancement of Industry 4.0 that emphasizes automating industrial processes with innovative technologies such as Robotics, machine learning, Artificial Intelligence, Big Data, and the Internet of Things (IoT) at the expense of human values and creativity. 4IR caused technology to replace many industrial workers and overtake their responsibilities, focusing solely on increased productivity regardless of the impact on man and the environment. The 5IR is an industrial revolution where people have opportunities to work and interact alongside innovative technologies to improve industrial processes for human and environmental interest and value sustainability. Rahmani, Karimi, Resende, Abrantes and Lopes (2023) remarked that 5IR centered on humans and transforms 4IR by merging human abilities with digital technology potentials. Therefore, 5IR brought humans and the environment back to industrialization instead of focusing solely on technology like the 4IR.

5IR involves creating value in the industry by integrating human-centricity, sustainability, and resilience (Van Erp, Carvalho, Gerolamo, Gonçalves, Rytter & Gladysz, 2024). The 5IR's human-centered, resilience, and sustainable approaches deal with adding value to people's lives through product and service personalization, promoting flexibility and adaptability to future circumstances, and offering a positive effect on the ecosystem.

Applying 5IR to education resulted in Education 5.0, which implies that education stakeholders, especially policymakers, curriculum planners, teachers, and learners, should work cooperatively with innovative technologies to create personalized learning experiences to suit every learner's needs to promote adaptability, flexibility, and a sustainable environment. Education 5.0 centered on learners rather than technologies to reduce negative technology impact on learners. Loesberg and Dervojeda (2025) noted that teaching and learning experienced pressure in 4IR with more attention focused on digital devices, thereby causing students to spend time on the computer screen to the detriment of classroom interactions. Loesberg and Dervojeda further remarked that teaching solely with technology may serve as a temporary solution during a crisis like the COVID-19 pandemic but could lead to more negative effects such as digital addiction, depression, isolation, and others among students. Martins (2024) averred that Education 5.0 addresses societal demands and problems posed by overreliance on technology. With the standpoints of the 5IR and education 5.0, educators need to devise means of integrating technology into the learning process in a manner that takes cognizance of learners' well-being and develops learners who are collaborative, creative thinkers and problem solvers; this could be to readjust and diversify how learners acquire and manage the information they need for their learning processes.

Information management involves obtaining, organizing, storing, recovering, and broadcasting information to enhance organizational goals (Detlor, 2010). Educational information management deals with teachers' and learners' ability to effectively search for, access, retrieve, handle, and evaluate information for instructional purposes using appropriate information sources. Effective information management helps learners construct knowledge and learn in the digital age with information overload (Chen & Zhang, 2021). The technological development of various industrial revolutions affects the process and information sources people adopt for information management. Industry 3.0 witnessed the prevalence of print media and human and traditional resources for information management. Johnson, Smith and Williams (2022) posit that Industry 4.0 focused learners' attention on digital information management using online databases, digital libraries, Artificial Intelligence, and learning management systems (LMS).

Digital tools may serve as a quick and up-to-date source of information on diverse topics, with enhanced downloading, saving, and sharing features, but may not provide in-depth analysis or critical views on a given subject or topic as traditional textbooks. Also, the author's credibility and professionalism in a proposed field are always uncertain since digital tools are open platforms

where people can create and post information without critical reviews. Traditional textbooks or print media may be expensive, outdated, and lack immediate access. However, they have in-depth and reliable content, which undergoes constant reviews by authors and editors in line with cutting-edge information for improved quality. Kirschner and De Bruyckere (2017) remarked that students face poor evaluation skills, digital distraction, and information overload when using digital sources for information management.

Teacher education programs face unique challenges in preparing future educators for effective information management in the 5IR context. Studies identified several critical gaps in how today's educators equip students for information management, which include overdependence on digital sources without balancing information with non-digital sources, inadequate information evaluation skills, fragmented information ecosystems, and low understanding of cognitive implications of students' inadequate exposure to necessary and complete information (Bergdahl & Nouri, 2021, Thompson, Lopez & Davis, 2023, Ahmed & Ibrahim, 2023). These challenges should necessitate educators to rethink how they assist and train learners to manage information to align with the 5IR principles.

Instead of replacing traditional information sources with digital tools, the 5IR demands students' ability to effectively manage information for their learning process using digital and non-digital information sources to reduce their dependency on the computer screen and its effects on their health and social lives. Akhtar and Ahmed (2023) maintained that educators should integrate different information sources, such as interpersonal, print, and digital sources, to manage information effectively in the 5IR and promote learners' cognitive development and overall well-being. Santos and McLean (2024) also proposed a blended information system, collaborative knowledge development, and ethical information usage as information management guidelines for educators.

There are few studies on academic information management. For instance, Iswan, Bahar, Ismah and Lestari (2022) observed that digital literacy and information resources have a significant and positive correlation as they assessed the trainee teachers' digital literacy and academic information system's effectiveness at Jakarta University. Adetunla (2016) remarked that students perceived digital information sources as difficult, non-flexible, and complex, with utilization and perceived ease having a positive correlation in their study on digital information sources utilization and perceived ease. Aderanti and Adedotun (2015) found that the Internet and library facilities are

limited information sources while lesson notes and instructors are the most available information sources, with a significant relationship between information resources utilization and availability, as they studied information resources utilization and availability influence on students' performance in a secondary school in Nigeria. Karim and Wong (2022) observed that students who used different information sources adapted greatly to class activities. Akpojotor (2017) investigated how post-graduate students perceived digital information sources' usefulness and ease of use and found that perception was positive and very high.

De Jager and du Plooy (2010) investigated the information sources that students prefer when choosing an academic institution in South Africa, and the students preferred to get information from websites and personal interactions. Cabfilan (2024) surveyed the students' preferred information source for learning purposes and found that the print media ranked highest in the students' preference, notwithstanding the digital information sources growth. Ode (2017) assessed the library and information students' information literacy skills and observed that the skills did not differ by gender. Taylor and Dalal (2017) surveyed students' information sources based on gender and found that gender influenced the students' information sources, with female students able to evaluate internet sources more than males. Okereke (2020) investigated how students perceived digital resource effectiveness for distance education programs and found that e-resources are very effective since they are current, easily accessed, and have vast information.

Analysis of the available literature on academic information management, none, to the best of the researchers' knowledge, provided an opportunity for students to choose the information sources they perceive as most effective, prefer, and are willing to use for academic information management in the context of 5IR. This literature gap, therefore, informed this study.

### **Statement of Problem**

Information remains the centre of all learning processes and the content or message for instructional communication. Every learner must possess the skills to search for, acquire, utilize, organize, and evaluate information from different sources. Therefore, information literacy and management skills help learners to create, use, analyze, and disseminate appropriate information using diverse information channels. Learners in the 20th-century era or the third Industrial Revolution utilized print-based resources and human interactions as information sources, possibly due to low technology breakthroughs at that period. These learners were serious in their studies

and high performers in academics and workplaces. However, the dawn of the 4IR shifted learners and society to technology-automated processes and made 21st-century learners depend on technology and digital resources for information management. Many schools even replaced traditional textbooks with online resources and encouraged their learners to always search for learning materials online without acquiring hardcopy textbooks for their courses. Owing to the problems that over-dependency on technology causes today's learners, which include but are not limited to laziness and lack of motivation for their studies, distractions, low concentration, aggression, isolation, vision impairment, low retention, and poor comprehension; 5IR called for a synergetic approach between technology utilization and human involvement for learners' and societal well-being. The government of Sweden started the move in 2022 to balance technological innovation with traditional educational methods by bringing back textbooks into the classroom (Curl, 2025). Despite the 5IR call, there is a need to ascertain today's learners' perspective about reintroducing non-digital resources into their learning processes since these learners seem glued to their digital tools for everything, especially in this era of Artificial Intelligence.

Therefore, this study's problem seeks to determine how Faculty of Education students perceive effectiveness, preferences, and willingness to use digital tools and non-digital resources for academic information management in the fifth industrial revolution.

### **Aim and Objectives of the Study**

The study aimed to investigate Faculty of Education students' perceived effectiveness, preferences, and willingness to adopt digital and non-digital academic information management in the fifth industrial revolution.

Specifically, the study sought to;

1. Find the information source Faculty of Education students perceive as most effective for academic information management in the 5IR.
2. Ascertain the information source Faculty of Education students prefer most when managing academic information in the 5IR.
3. Determine the information sources that Faculty of Education students are willing to use when managing academic information in the 5IR.

## Research Questions

These research questions guided this study

1. Which information sources do Faculty of Education students perceive most effective for academic information management in the 5IR?
2. Which information sources do Faculty of Education students prefer most when managing academic information in the 5IR?
3. Which information sources are Faculty of Education students willing to use when managing academic information in the 5IR?

## Hypotheses

The researchers tested these hypotheses at a 0.05 significant level.

1. There is no significant relationship between gender and the information sources Faculty of Education students perceive as most effective for academic information management in the 5IR.
2. No significant relationship exists between gender and Faculty of Education students' preferred information sources for managing academic information in the 5IR.
3. There is no significant relationship between gender and the information sources the Faculty of Education students are willing to use when managing academic information in the 5IR.
4. There is no significant relationship in the Faculty of Education students perceived most effective, most preferred, and willing to use information sources for academic information management in the 5IR.

## Methodology

**Research Design:** This study adopted a mixed research design, descriptive survey, and correlational designs.

**Population:** The study's population is 3,405 undergraduate students in the Faculty of Education, University of Port Harcourt (Source, Faculty of Education Record, 2025).

**Sample and Sampling Technique:** The study's sample is 550 students, selected through a stratified random sampling technique.

**Instrument for Data Collection:** The researchers collected data using a self-constructed questionnaire titled Students' Perceived Effectiveness, Preference, and Willingness to Use Digital Tools, Non-Digital Resources or Both for Academic Information Management in the Fifth

Industrial Revolution (SPEPWNDBAIM5IR). The questionnaire contained two sections. The first section collected the students' demographic information. The second session elicited responses based on the research questions. The second session has four response options, which are Digital tools such as Internet databases, online libraries, and AI assistants (DT), Non-digital Resources such as print materials, human experts (NDR), Combined Digital and Non-digital Resources (CDNDR) and None (No). The students were to choose only one response option that matched their information sources for managing academic information. Each response option has the same point.

**Validity of the Instrument:** The instrument underwent face and content validity by experts

**Reliability of the Instrument:** The instrument was subjected to Cronbach alpha reliability testing to obtain a 0.80 reliability index.

**Data Collection Procedure:** The researchers prepared the instrument in Google form and copied the link to the students' WhatsApp group platforms to elicit their responses, which the researchers collated automatically.

**Data Analysis Procedure:** The researchers analyzed research data using frequency and percentage and tested the hypotheses in SPSS using Chi-square and Spearman rho correlation.

## Results

**Research Question 1:** Which information sources do Faculty of Education students perceive as the most effective for academic information management in the 5IR?

**Table 1: Frequency and percentage analysis of the information sources that Faculty of Education students perceive as most effective for academic information management in the 5IR**

Items	Frequency	Percent
Digital tools such as Internet databases, online libraries, and AI assistants	220	40
Non-digital Resources such as print materials and human experts	5	0.9
Combined Digital and Non-digital Resources	325	59.1
None	0	0
Total	550	100.0

Table 1 reveals that 220(40%) students perceived digital tools such as Internet databases, online libraries, and AI assistants as the most effective information sources for academic information management in the 5IR. 5(0.9%) students chose non-digital resources such as print materials and human experts. 325(59.1%) students perceived combined digital and non-digital resources as the most effective information sources for academic information management in the 5IR.

**Research Question 2:** Which information sources do Faculty of Education students prefer most when managing academic information in the 5IR?

**Table 2: Frequency and percentage analysis of the information sources that Faculty of Education students prefer most when managing academic information in the 5IR**

Items	Frequency	Percent
Digital tools such as Internet databases, online libraries, and AI assistants	190	34.5
Non-digital Resources such as print materials and human experts	25	4.5
Combined Digital and Non-digital Resources	335	60.9
None	0	0
Total	550	100.0

Table 2 shows that 190(34.5%) students preferred digital tools such as Internet databases, online libraries, and AI assistants, and 25(4.5%) students preferred non-digital resources such as print materials and human experts. 335(60.9%) students preferred combined digital and non-digital resources when managing academic information in the 5IR.

**Research Question 3:** Which information sources are Faculty of Education students willing to use when managing academic information in the 5IR?

**Table 3: Frequency and percentage analysis of the information sources that the Faculty of Education students are willing to use when managing academic information in the 5IR**

Items	Frequency	Percent
Digital tools such as Internet databases, online libraries, and AI assistants	215	39.1
Non-digital Resources such as print materials and human experts	20	3.6

Combined Digital and Non-digital Resources	305	55.5
None	10	1.8
Total	550	100.0

Table 3 shows that 215(39.1%) students were willing to use digital tools such as Internet databases, online libraries, and AI assistants, 20(3.6%) were willing to use non-digital resources such as print materials and human experts, 305 (55.5%) were willing to use combined digital and non-digital resources. 10(1.8%) students were unwilling to use any information sources when managing academic information in the 5IR.

**Hypothesis 1:** There is no significant relationship between gender and the Faculty of Education students' perceived as the most effective information source for academic information management in the 5IR

**Table 4: Chi-square analysis of the relationship between gender and the most perceived effective information source**

		Perceived Source	Most Effective Information	Total	Chi-Square (X <sup>2</sup> ) Value	df	Cramer's V	p-value	Decision	
			Digital tools	Non-digital resources	Combined Digital and Non-digital resources					
Gender	Male	Count	110	0	60	63.363 <sup>a</sup>	2	0.34	0.00	Rejected
		Expected Count	68.0	1.5	100.5					
Female		Count	110	5	265	63.363 <sup>a</sup>	2	0.34	0.00	Rejected
		Expected Count	152.0	3.5	224.5					
		Total	220	5	325	550				

Table 4 showed that  $X^2(2, N = 550) = 63.363, p = 0.00 < 0.05$  alpha level, and Cramer's V = 0.34; thus, the researchers rejected the hypothesis that there is no significant relationship between gender and the Faculty of Education students' perceived most effective information source for academic information management in the 5IR and accepted the alternative. Thus, a significant relationship exists between gender and the information sources Faculty of Education students perceived as most effective for managing academic information in the 5IR. Male students perceived digital tools

as highly effective, while female students perceived combined digital and non-digital sources as highly effective for managing academic information in the 5IR.

**Hypothesis 2:** No significant relationship exists between gender and Faculty of Education students' preferred information sources for managing academic information in the 5IR.

**Table 5: Chi-Square Analysis of the relationship between gender and most preferred information sources**

		Most Preferred Information Sources			Total	Chi-Square (X <sup>2</sup> ) Value	df	Cramer's V	p- valu e	Decision
		Digita l tools	Non- digital resources	Combine d Digital and Non- digital resources						
Ge nde r	Mal e	Count	90	10	70	40.800 <sup>a</sup>	2	0.272	0.00	Rejected
		Expecte d Count	58.7	7.7	103.5					
	Fem ale	Count	100	15	265	380				
		Expecte d Count	131.3	17.3	231.5	335	550			
Total		190	25	335	550					

Table 5 reveals that  $X^2(2, N = 550) = 40.800, p = 0.00 < 0.05$  alpha level, and Cramer's  $V = 0.272$ ; thus, the researchers rejected the hypothesis that no significant relationship exists between gender and Faculty of Education students' preferred information sources for managing academic information in the 5IR and accepted the alternative. Thus, there is a significant and moderate relationship between gender and Faculty of Education students most preferred the information sources for managing academic information in the 5IR; this implies that gender influences the information sources Faculty of Education students prefer when managing academic information in the 5IR with male and female students showing more preference for digital tools, and combined digital and non-digital sources, respectively, than other resources.

**Hypothesis 3:** There is no significant relationship between gender and the information sources Faculty of Education students are willing to use when managing academic information in the 5IR.

**Table 6:** Chi-Square Analysis of the relationship between gender and willingness to use information source

		Willing to Use Information Sources					Total	Chi-Square (X <sup>2</sup> ) Value	df	Cramer's V	p-value	Decision
		Digital tools	Non-digital resources	Combined Digital and Non-digital resources	None							
Gender	Male	Count	95	0	75	0	170	36.871 <sup>a</sup>	3	0.259	0.00	Rejected
		Expected Count	66.5	6.2	94.3	3.1						
Female		Count	120	20	230	10	380					
		Expected Count	148.5	13.8	210.7	6.9						
		Total	215	20	305	10	550					

Table 6 indicates that  $X^2(3, N = 550) = 36.871, p = 0.00 < 0.05$  alpha level, Cramer's  $V = 0.259$ ; thus, the hypothesis that there is no significant relationship between gender and the information sources Faculty of Education students are willing to use when managing academic information in the 5IR is rejected, and the alternative is accepted. Thus, there is a significant and moderate relationship between gender and the information sources Faculty of Education students are willing to use when managing academic information in the 5IR. Male students were willing to use more digital tools, while female students were willing to use more combined digital and non-digital sources than other information sources.

**Hypothesis 4:** There is no significant correlation in the Faculty of Education students perceived most effective, most preferred, and willing to use information sources for academic information management in the 5IR.

**Table 7: Spearman's rho correlation coefficient analysis on the Faculty of Education students perceived most effective, most preferred, and willing to use information sources**

		Perceived Most Effective	Preferred Information Source	Willing to Use Information Source	Decision
Spearman's rho	Perceived Most Effective	Correlation Coefficient	1.000	<b>0.607**</b>	0.475**
		Sig. (2-tailed)	.	<b>0.000</b>	0.000
		N	550	550	550
	Preferred Information Source	Correlation Coefficient	0.607**	1.000	<b>0.639**</b>
		Sig. (2-tailed)	0.000	.	<b>0.000</b>
		N	550	550	550

Reject

Willing to Use Information Source	Correlation Coefficient	<b>0.475**</b>	0.639**	1.000
	Sig. (2-tailed)	<b>0.000</b>	0.000	.
	N	550	550	550

Table 7 reveals that there is a strong positive and significant correlation between the perceived as the most effective and preferred information source (correlation coefficient = 0.607,  $p = 0.000 < 0.05$ ), between preferred information source and willingness to use (correlation coefficient = 0.639,  $p = 0.000 < 0.05$ ) but a weaker and significant correlation between perceived effectiveness and willing to use information source (correlation coefficient = 0.475,  $p = 0.000 < 0.05$ ). Therefore, the researchers rejected the hypothesis that there is no significant correlation between the Faculty of Education students perceived most effective, most preferred, and willing to use information sources for academic information management in the 5IR and accepted the alternative. Thus, there are positive and significant relationships in the information sources Faculty of Education students perceive as most effective, prefer, and are willing to use for academic information management in the 5IR.

### Discussion of Findings

Table 1 result revealed that most Faculty of Education students (59.1%) testified of the effectiveness of combined digital and non-digital resources for academic information management in the 5IR. Some (40%) of them perceived the effectiveness of digital tools such as Internet databases, online libraries, and AI assistants, with few students (0.9%) still trusting the effectiveness of non-digital resources, like print materials and human experts. Table 4 showed a significant relationship between gender and the perceived most effective information sources among the Faculty of Education students. The male students perceived digital tools as highly effective. Female students perceived combined digital and non-digital sources as highly effective for managing academic information in the 5IR. These findings imply that although some students perceived digital tools as effective information sources, combining them with traditional print materials and human experts remains the best approach for effective academic information management in the 5IR. Therefore, teachers should not allow technology to replace conventional information sources but to complement them for a holistic learning experience. These findings align with Aderanti and Adedotun (2015) and Adetunla (2016) but disagree with Akpojotor's (2017) and Okereke's (2020) findings.

Table 2 showed that most Faculty of Education students (60.9%) preferred to use combined digital and non-digital resources when managing academic information in the 5IR. A good number of the students (34.5%) preferred using solely digital tools such as Internet databases, online libraries, and AI assistants, and few students (4.5%) still preferred to use non-digital resources such as print materials and human experts. Table 5, however, revealed a significant and moderate relationship between gender and Faculty of Education students' most preferred information sources for managing academic information in the 5IR, with males showing more preference for digital tools. The female students indicated more preference for combined digital and non-digital sources. These findings signify that while some students are inclined to technological-based solutions, most students understand the importance of integrating technology with traditional learning strategies and media in a hybrid approach for a complete learning experience. These findings align with de Jager and du Plooy (2010) but disagree with Ode (2017) and Cabfilan (2024).

Table 3 result illustrated that most Faculty of Education students (55.5%) showed a willingness to use digital tools such as Internet databases, online libraries, and AI assistants for academic information management in the 5IR. Some students were willing to depend on digital tools such as Internet databases, online libraries, and AI assistants, few students (3.6%) were willing to use non-digital resources such as print materials, and an insignificant number of the students (1.8%) were unwilling to use any of the information sources when managing academic information in the 5IR. This result is gender dependent, as shown in Table 6, which revealed that male students were willing to use more digital tools, while female students were willing to use more combined digital and non-digital sources than other information sources. These findings affirm that although there is a strong willingness to adopt digital learning resources for male students, most students, especially females, still desire an all-inclusive learning approach while understanding the drawbacks of depending solely on a single means of information. These findings agree with Taylor and Dalal (2017) but not with Ode's (2017) finding.

Table 7 disclosed positive, meaningful, and significant correlations in the information sources Faculty of Education students perceive as most effective, prefer, and are willing to use for academic information management in the 5IR. This result proved that students' perceived effectiveness of any information sources greatly influenced their preferences and willingness to adopt them for learning purposes. Therefore, students are ready and willing to use diverse learning resources when they ascertain their effectiveness and relevance to their study, not basically due to

their technological attributes. This finding agrees with Iswan, Bahar, Ismah and Lestari (2022), who recorded a significant positive correlation between digital literacy and academic information resources.

### **Conclusion**

This study established Faculty of Education students' perceived effectiveness, preferences, and willingness to adopt digital and non-digital for academic information management in the fifth industrial revolution. Evidence from the findings proved that Faculty of Education students understand the effectiveness of combining digital and non-digital information sources and showed preference and willingness to utilize them for effective academic information management in the 5IR. The findings further revealed moderate and significant gender-based associations between perceived effectiveness, preferences, and a willingness to use various information sources, with male students showing greater inclination to digital tools. Female students chose the combined digital and non-digital resources. The students also showed a strong and positive correlation between perceived effectiveness, preference, and willingness to use digital and non-digital resources for academic information management in the 5IR. This study, therefore, exposes the effectiveness of students' preferences and willingness to use a hybrid approach to information management and reinforces the 5IR's proposition of harmonizing technology utilization with traditional learning approaches for holistic learning experiences.

### **Recommendations**

1. Educators should demonstrate the effectiveness of hybrid information sources and make them desirable and necessary for utilization for academic information management in the 5IR.
2. Institutions should equip libraries with print materials and digital facilities to encourage students to access and explore diverse resources based on their preferences and learning needs.
3. Educators should encourage students to acquire hardcopy textbooks for all their courses, create home libraries, and employ digital and non-digital resources when searching for, utilizing, and evaluating academic information without depending solely on digital tools.
4. There should be further research on the effect of digital and non-digital learning tools on student performance.

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