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FROM PRE-SERVICE TO PROFESSIONAL: ASSESSING FUTURE EDUCATORS' INFORMATION LITERACY PROFICIENCY TO EVALUATE ONLINE TEACHING RESOURCES

***A. O. SAKA AND O. D. OLURINOLA**

Department of Science and Technology, Faculty of Education, Olabisi Onabanjo University, Ago-Iwoye, Nigeria

Corresponding Author: wale.saka@oouagoiwoye.edu.ng **Tel**. +234 805 584 7112

ABSTRACT

In the era of digital transformation, pre-service teachers must master information literacy to evaluate online teaching resources effectively amid rampant misinformation. Therefore, this study assessed the proficiency of third-year pre-service teachers at Olabisi Onabanjo University, Nigeria, following their completion of the "ICT in Education" course, examining their perceived skills in authority, credibility, bias, currency, relevance, and media evaluation, while exploring gender and field-of-study differences. Employing a descriptive design, data were collected via the validated Online Resource Validation Questionnaire (ORVQ; Cronbach's α = 0.77) and analysed using descriptive statistics, t-tests, and ANOVA. There was high overall proficiency (grand mean = 3.42). The pre-service teacher's strongest skills were in information searching/research (M = 14.18) and weakest in media/content evaluation (M = 13.17). No significant differences emerged by gender ($t(1006) = 0.251$, $p = 0.802 > 0.05$) or field of study ($F_{(4,1003)} = 1.018$, $p = 0.397 > 0.05$), indicating equitable competencies across demographics. The study concluded that pre-service teachers are digitally adept but require more in-depth evaluative training. To empower educators to navigate the digital landscape and ensure the integration of credible resources for enhanced teaching outcomes, the study recommends integrating advanced critical modules into teacher education curricula to combat information pollution and foster lifelong learning.

Keywords: Information literacy; pre-service teachers; teacher education; ICT integration; source evaluation.

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INTRODUCTION

The Information Age 3.0, driven by artificial intelligence (AI), big data, and the Internet of Things (IoT), has ushered in a new era of pervasive digital transformation, necessitating the integration of information technology (IT) across all facets of human endeavours, including education. Characterised by advanced digital technologies, ubiquitous connectivity, and data-driven decision-making, this era is shaping a fully digital, intelligent society. These developments have a profound influence on the creation, access, and dissemination of knowledge. Yan (2024) notes that the rise of AI and its related technologies has redefined information as an intangible yet powerful resource, fundamentally reshaping human thought and behaviour.

Ramazani and Talebi (2023) also observed that technology is shaping societal beliefs in an information-saturated environment, due to the rapid development of technologies, including computers, the internet, and smartphones. Consequently, education systems worldwide increasingly leverage digital technologies to enhance teaching and learning processes, thereby enabling teachers to access numerous online resources, including digital textbooks, multimedia content, adaptive learning platforms, and virtual simulations.

The Federal Republic of Nigeria (FRN, 2014), through the National Policy on Education, stated that teacher education programmes shall be structured to equip teachers for the adequate performance of their duties and that Information technology (IT) training shall be incorporated into all teacher training programmes due to the importance of technologies in revolutionising education. Consequently, a course titled Information and Communication Technology (ICT) in Education (ICT in Education) was introduced into teacher education programmes nationwide to enable pre-service teachers acquire skills in using digital resources for teaching and learning when they become in-service teachers. The Federal Ministry of Education (FME, 2019) also stated that parts of the objectives of ICT in Education are to enhance universal access to information and to widen access to education and the range of instructional options and opportunities regardless of the learners' locations and abilities/disabilities; to facilitate teaching and learning processes; to promote life-long learning and advance knowledge; and to promote commercialisation of ICT. Similarly, Yan (2024) argued that pre-service teachers should possess information literacy and other professional survival skills to navigate this era of computing intelligence to be ready for an information-driven world.

Pre-service teachers play a pivotal role in leveraging online teaching resources for effective instruction. Consequently, they need to become information literate and transition from basic internet users to proficient evaluators of online teaching materials. Ramazani and Talebi (2023) stated that teachers need information literacy or digital skills to develop their ability to use Information and Communication Technology tools. This observation aligns with the report by Karakoyun and Lindberg (2020), who suggested that information literacy, digital citizenship, and communication are essential components of the digital skills that pre-service teachers should possess.

Information literacy (IL), coined by Zurkowski (1974) in the United States, refers to an individual's ability to identify, locate, evaluate, organise, create, use and communicate information effectively to solve problems (Yan, 2024). It is further described as the ability to understand, appreciate, discern and critique information when interacting with it. IL is a fundamental skill that enables individuals meet societal demands while fostering self-directed and lifelong learning (Shi *et al.*, 2023). This skill has been identified as key to surviving in the information society due to its importance in fostering development, prosperity, and freedom (Hanif and Hassan, 2025). Ruppel *et al.* (2016) emphasised that equipping teachers with practical information literacy skills is essential for developing learners who can successfully navigate the challenges of the 21st century. However, their ability to critically evaluate and discern the credibility of these resources remains a pressing concern.

While digital and online resources offer unprecedented opportunities for innovative teaching, they pose significant challenges for teachers in evaluating their quality, relevance, and credibility. Falloon (2020) observed that while the unrestricted availability of information on nearly every topic online can be enriching, leveraging it effectively requires the skills to engage with and critically assess the credibility of its sources. Therefore, evaluating online teaching and learning resources is crucial, as not all are reliable. Since the advent of the internet, humanity has experienced an increase in information pollution, making it difficult to distinguish between good and bad information (Petrocchi and Viviani, 2023). Orman (2015) reiterated that technology can be both delightful and overwhelming for users. The abundance of information risks overshadows their proper understanding and usage. It is also observed that the quantity of information may overshadow its quality, leading to an abundance of poor-quality information. Orman maintained that producing high-quality information is costly, whereas producing poor-quality information is relatively inexpensive, particularly given the widespread availability of infrastructure such as the internet. The education sector is not immune to the effects of poor-quality information, which has permeated cyberspace. The implication is that teachers have an extensive repertoire of information bases from which to source teaching and learning materials, but may select the less effective ones if they are not adequately exposed to these online teaching and learning tools during teacher education programmes.

Trixa and Kaspar (2024) noted the dependence of pre-service teachers on digital resources, along with the attendant misinformation, and emphasised the need for critical evaluation skills to thrive. They reported that pre-service teachers prefer surface-level strategies for evaluating online teaching resources and lamented that Universities have not been teaching students information literacy skills, instead focusing on the technical aspects of digital tools. The researchers suggested that effective evaluation strategies are crucial for identifying misinformation and assessing the credibility of teaching and learning resources. Similarly, Peciuliauskiene *et al.* (2022) recommended that teacher educators should develop pre-service teachers who are well-skilled in information literacy.

Another variable of interest in this study is gender. Research on gender differences in digital and ICT literacy has revealed varied patterns influenced by socio-economic factors, age, and literacy dimensions. Girls often outperform boys in digital skills during adolescence, with variations observed across countries and socio-economic contexts (Campos and Sherer, 2024). However, by age 18, boys show slightly higher ICT literacy, a trend that continues into adulthood, where males consistently surpass females, driven by early socialisation (Gnambs and Schwab, 2025). Gender disparities also appear in specific literacy dimensions: males excel in functional skills, professional production, and privacy/security, while females score higher in ethical responsibility and daily usage (Harputlu and Guryay, 2024). These findings highlight the complex interplay among gender, socio-cultural factors, and the development of digital literacy, underscoring the need for targeted interventions to promote equity.

Hence, this study assessed information literacy proficiency, often used interchangeably with digital competency, among 300L pre-

service teachers at Olabisi Onabanjo University, Ago-Iwoye, Nigeria. It examined how well-equipped they are to navigate and evaluate online teaching resources in preparation for their professional roles after completing a course titled ICT in Education, coded EDU 304. The study also included how gender affects the information literacy proficiency of pre-service teachers.

Objectives

The primary objective of this study was to assess the information literacy proficiency of pre-service teachers in the context of online teaching resources.

The specific objectives were to:

i. Determine the level of information literacy concerning the use of online teaching resources.
ii. Determine the pre-service teachers' skill areas in evaluating online resources for teaching and learning.
iii. Determine the information literacy proficiency of pre-service teachers by gender and programme of study.

Research Questions

The following questions were raised to guide the study:

i. What is the level of information literacy proficiency among pre-service teachers?
ii. Which evaluation skill areas do the pre-service teachers possess most potently?

Statement of the Hypotheses

The following hypotheses were formulated to guide the study:

$H_0$1: There is no significant difference in information literacy proficiency levels among pre-service teachers by their field of study.

$H_0$2: There is no significant difference in information literacy proficiency levels among pre-service teachers by gender.

METHODOLOGY

Research Design

This study employed a descriptive research design to assess the information literacy proficiency of pre-service educators in evaluating online teaching and learning resources. The design was used because it facilitates the systematic collection of data from participants' responses to a structured questionnaire.

Target Population

The target population consisted of 1300 year three (300L) undergraduate students who registered for EDU 304, "ICT in Education," at the Faculty of Education, Olabisi Onabanjo University, Ago-Iwoye, Nigeria, in the 2023/2024 academic session. The Faculty of Education of Olabisi Onabanjo has five (5) Departments: Arts and Social Science Education (ASSED), Educational Foundations and Counselling (EFC), Educational Management and Business Studies (EMBS), Human Kinetics and Health Education (HKKE), and Science and Technology Education (STED). The students across these Departments were pre-service teachers undergoing teacher education training, and EDU 304 was a compulsory course designed to teach them how to integrate information and communication technologies (ICT) into teaching, learning, examination and administrative tasks in educational settings. Since the course focuses on digital literacy and technology-enhanced learning, the participants were considered an appropriate sample to evaluate their proficiency in assessing online teaching resources.

Sample and Sampling Technique

The study employed a sample of 1,008 third -year (300-level) students who responded to an online questionnaire administered via a Google form distributed through their WhatsApp groups and Microsoft Teams' channels . This sample was drawn from a population of 1,300 students registered for EDU 304 (ICT in Education) during the second semester of the 2023/2024 academic session. The sampling technique employed was convenience sampling, as participation was based on students' access to and engagement with the questionnaire link shared in the WhatsApp groups and Microsoft Teams' channels.

Instrumentation

Data were collected using a structured questionnaire titled "Online Resource Validation Questionnaire (ORVQ)," designed to measure participants' information literacy skills. The questionnaire had two sections: Section A comprised items eliciting responses about the demographic information of the participants; Section B consisted of 20 Likert-scale items to assess perceived competence, particularly in evaluating the authority and credibility, currency and relevance, bias and purpose, content verification, as well as search and research skills of the learners concerning online teaching and learning resources. The instrument was validated for content relevance by two experts in educational technology and information technology from the Faculty of Education at Olabisi Onabanjo University, Ago-Iwoye. The instrument was trial-tested with 30 students from Sikiru Adetona College of Education, Omu-Ajose, Ijebu, affiliated to the University's Faculty of Education, to ensure clarity and reliability. The responses from these students yielded a Cronbach's alpha of 0.77, indicating acceptable internal consistency.

Procedure for Data Collection

Data collection took place at the end of the EDU 304 course, ensuring that participants had completed relevant instructions on ICT integration in education. Before administering the questionnaire, the students were adequately briefed about it. They were asked to complete the questionnaire as part of the continuous assessment activities in the course to increase the number of participants and boost their truthfulness when filling out the questionnaire. Thereafter, the survey was distributed electronically via Google Forms to the registered students' WhatsApp platforms and Microsoft Teams channels. The participants were given one week to complete the questionnaire, with two reminder messages to enhance response rates. The responses were anonymised and aggregated for analysis.

Data Analysis

The data were analysed using descriptive and inferential statistics via SPSS, version 23. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarise participants' self-reported proficiency levels. The criterion mean of 2.5 was used for decision-making, with any mean above 2.5 considered high and any below 2.5 considered low. The inferential statistics were independent-samples t-tests and Analysis of Variance (ANOVA) to examine differences in proficiency based on gender and field of study, respectively.

RESULTS

The results are presented according to the research questions and hypotheses. Answering the research questions precedes the testing of the formulated hypotheses.

Research Question 1: What is the level of information literacy proficiency of pre-service teachers?

All items' mean scores exceeded the 2.5 benchmark, with scores ranging from 2.95 to 3.81, reflecting generally high proficiency (Table 1). The perceived key practices included critically evaluating headlines (Mean = 3.66, S. D = 1.163), considering website domains (Mean = 3.45, S. D. = 1.266), verifying author credentials (Mean = 3.12, S.D. = 1.314), and cross-checking facts across multiple sources (M = 3.45, S. D. = 1.246). The grand mean of 3.42 and the S.D. of 1.246 confirm a high level of information literacy, indicating strong skills in assessing and verifying online information (Table 1).

Table 1. Descriptive statistics on the level of information literacy proficiency of pre-service teachers (N = 1008)

Items	Mean	Std. D
I critically evaluate the headline or title of an online source before considering it.	3.66	1.163
I pause to consider the domain of a website before deciding if it is a reliable source.	3.45	1.266
I actively look for information about the author's qualifications and expertise.	3.12	1.314
I make an effort to check if the source provides citations or references.	3.44	1.247
I check for the publication date to ensure it is current and relevant.	3.33	1.271
I cross-check information across multiple reputable websites.	3.45	1.246
I double-check statistics and data for accuracy and reliability.	3.50	1.231
I check whether the author has a history of producing credible, reliable content.	3.16	1.300
I consider whether the headline uses sensational or emotional language.	3.28	1.267
I critically assess language and tone to detect potential biases.	3.32	1.272
I remain cautious when information aligns too perfectly with my existing beliefs.	3.52	1.222
I am cautious about clicking links from suspicious-looking websites.	3.81	1.196
I verify the authenticity of images or videos included in the source material.	3.44	1.256
I scrutinise quoted statements for accuracy.	3.25	1.257
I use reverse image search or similar tools to verify images or videos.	2.95	1.325
I scrutinise user-generated content and social media posts for reliability.	3.52	1.222
I cross-check information across multiple reputable websites.	3.45	1.246
I seek information from established, well-known news organisations.	3.52	1.245
I actively search for diverse viewpoints and opinions.	3.66	1.153
I educate others about the importance of evaluating online information critically.	3.55	1.215
Grand Mean	**3.42**	**1.246**

Research Question 2: Which of the skill areas do the pre-service teachers possess most potently?

Pre-service teachers demonstrated the highest proficiency in searching and researching using online resources, with a mean score of 14.18 and a standard deviation of 3.511 (Table 2), indicating that they are most adept at locating, retrieving and organising information, which are fundamental processes in research tasks. Their ability to evaluate resource bias followed, with a mean score of 13.93 and a standard deviation of 3.53. Skills in evaluating authority and credibility sources scored a mean of 13.68, S.D. = 3.458, implying a relative potency in discerning source quality. Evaluating the currency and relevance of online resources had a mean score of 13.44, S.D. = 3.694. The lowest proficiency was observed in content and media evaluation, with a mean score of 13.17; SD. = 3.757 (Table 2). These results indicate that, among the various aspects of information literacy measured, pre-service teachers are most skilled in searching and conducting online research. The range of means from 13.17 to 14.18 suggests a moderately high but clustered proficiency across all areas, with no extreme outliers in strength or weakness. This narrow spread, with a difference of only 1.01 between the highest and lowest means, implies that pre-service teachers exhibit a balanced but not exceptional proficiency in information literacy.

Table 2: Descriptive analysis of the level of information literacy proficiency among pre-service teachers

Proficiency/Skill Area	Mean	Std. Deviation
Evaluation of Authority and Credibility	13.68	3.458
Currency and Relevance	13.44	3.694
Evaluation of Resource Biases	13.93	3.530
Evaluation of Media and Content	13.17	3.757
Information Searching/ Research	14.18	3.511

Test of Hypotheses

$H_0$1: There is no significant difference in information literacy proficiency levels among pre-service teachers by gender.

The analysis indicated no significant difference between male (M = 68.56, SD = 15.45) and female (M = 68.31, SD = 15.26) participants, $t(1006) = 0.251$, $p = 0.802 > 0.05$ (Table 3). The mean difference of 0.2 was negligible, suggesting that gender does not significantly influence information literacy proficiency in the selected sample. Consequently, the null hypothesis that there is no significant gender-based difference in information literacy proficiency levels among pre-service teachers was retained. However, the high standard deviations of 15.45 for males and 15.26 for females (Table 3) indicate variability within groups, suggesting that individual differences (e.g., prior digital exposure, training quality) may be more influential than gender.

Table 3: T-test of gender difference in information literacy proficiency levels among pre-service teachers

Gender	N	Mean	Std. D	F	Sig.	T	df
Male	366	68.56	15.45	0.031	0.802	0.251	1006
Female	642	68.31	15.26				

*. Correlation is significant at the 0.05 level (2-tailed).

$H_0$2: There is no significant difference in information literacy proficiency levels among pre-service teachers by field of study.

There was no significant difference among the groups, $F_{(4, 1003)} = 1.018$, $p = 0.397$, $p > 0.05$, regarding their proficiency in the assessed area of information literacy (Table 4). This outcome indicates that the observed differences in mean scores across the five academic Departments in the Faculty of Education, ASSED ($\bar{x}$=68.67), STED ($\bar{x}$=66.77), EMBS ($\bar{x}$=68.61), EFC ($\bar{x}$=69.47), and HKHE ($\bar{x}$=69.53) -Table 4, are not sufficient to conclude that the field of study has a significant effect on information literacy proficiency. Therefore, the hypothesis that there was no significant difference in information literacy proficiency levels among pre-service teachers by field of study was retained.

Table 4: One-way ANOVA of difference in information literacy proficiency levels among pre-service teachers based on their field of study

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	955.496	4	238.874	1.018	0.397
Within Groups	235409.774	1003	234.706		
Total	236365.270	1007			

ASSED (N=356, $\bar{x}$=68.67); STED (N=241, $\bar{x}$=66.77); EMBS (N=175, $\bar{x}$=68.61); EFC (N=156, $\bar{x}$=69.47); HKHE (N=80, $\bar{x}$=69.53)

DISCUSSION

This study examined the proficiency of pre-service teachers in evaluating online resources for teaching and learning. Findings indicate that pre-service teachers demonstrate a generally high level of information literacy proficiency. On average, participants possess strong competencies in evaluating, verifying and cross-checking online information before accepting it as credible. These results support the report of Awofala *et al.* (2025), which indicated that pre-service computer science teachers possess high levels of digital and information literacy. However, these findings contradict earlier reports by Ramazani and Talebi (2023) and Pearlman *et al.* (2024), who documented low levels of information literacy proficiency among pre-service teachers. The current study reveals that the highest-rated practices among participants are exercising caution with suspicious-looking websites, critically evaluating headlines and actively seeking diverse viewpoints. These findings underscore the im-

portance of heightened awareness of overt cues related to source reliability and the value of considering multiple perspectives, both of which are crucial for mitigating the spread of misinformation.

The lowest-rated skill is the use of reverse image search to verify visual content. While participants appear adept at text-based evaluation strategies, they are less proficient in applying advanced digital verification tools, particularly for multimedia content. This gap may reflect either a lack of awareness of such tools or insufficient practical demonstration and reinforcement during the ICT in Education (EDU 304) course. Nevertheless, the overall results highlight readiness of the pre-service teachers to engage critically with online information while simultaneously pointing to specific areas requiring pedagogical enrichment. Addressing these skill gaps remains essential to preparing educators to effectively navigate and counter the challenges posed by today's complex information landscape.

The findings further highlight distinct patterns in pre-service teachers' information literacy proficiency. The highest mean score was obtained in information searching and research skills, indicating strong capabilities in locating and retrieving online resources. This outcome is usual, given the pervasive integration of search engines, databases and digital tools in pre-service teacher training programmes, particularly through recurring assignments that require literature reviews, lesson planning, and evidence-based practices. Repeated engagement with such tasks appears to have effectively honed participants' search skills.

The mean score for media and content evaluation that was lowest suggests notable challenges in critically assessing the quality, accuracy and potential biases of information sources. Such a finding is particularly concerning in today's multimedia-saturated educational environment, where teachers must regularly critique videos, infographics, and social media content for both accuracy and pedagogical suitability. The possession of strong search skills without corresponding critical appraisal skills risks the unintentional propagation of misinformation in classrooms. The relatively lower performance in media and content evaluation compared with information searching may stem from differences in cognitive demand. Searching and retrieving information typically involve lower -order cognitive processes (remembering and understanding), whereas evaluation constitutes a higher-order skill. Consequently, pre-service teachers may have developed greater proficiency in searching because it is more readily acquired through routine practice, while evaluation skills require more explicit and sustained instructional attention.

Intermediate skills demonstrated by participants include evaluating resource biases, authority, credibility, currency, and relevance. This distribution suggests the existence of a skills hierarchy in which basic access and retrieval competencies currently outpace deeper analytical abilities. Such an imbalance may limit pre-service teachers' capacity to model comprehensive information literacy for their future students. From a socio-cultural perspective, in this era of rapid informatisation, an overemphasis on information searching without a commensurate strength in evaluation can contribute to information overload, leading pre-service teachers to accumulate vast amounts of data but lacking the discernment to use them effectively. This situation ultimately undermines the intended outcomes of courses such as ICT in Education.

The patterns observed in this study align with trends reported in several related investigations. For example, Ramazani and Talebi (2023) similarly found that pre-service teachers often lack depth in evaluating digital information, mirroring the lower scores in media and content evaluation obtained here. Likewise, Ruppel et al. (2016) reported that pre-service teachers demonstrate familiarity with basic search tools but struggle with assessing credibility and bias, attributing this shortfall to insufficient emphasis on these competencies within teacher education programmes.

The observed absence of significant gender-based differences in information literacy proficiency among pre-service teachers is an implication that male and female pre-service teachers possess comparable skills in navigating, evaluating, and utilising online resources for teaching and learning. The is consistent with the report of Awofala *et al.* (2025), that there are no gender differences in the information literacy levels of male and female computer science pre-service teachers. Nevertheless, it contrasts with the results of Subeskti (2018) and Vera and Valencerina (2022), who found evidence of gender differences in information literacy proficiency. The convergence in information literacy skills between male and female pre-service teachers may be attributed to increasingly equitable access to technology. In particular, the tendency for female students to use more advanced mobile devices than their male counterparts appears to provide comparable levels of access to digital tools, internet connectivity, and online learning platforms. This equal exposure likely fosters similar skill development and minimises gender disparities. It may also reflect broader societal progress toward gender equality and a shift in emphasis from demographic characteristics to individual competency. Differences reported in earlier studies may therefore represent contextual or temporal factors that have since evolved. These considerations underscore the need for continuous monitoring of the relationship between gender and information literacy across diverse educational settings.

The observed no significant differences in information literacy proficiency among pre-service teachers by field of study suggest that information literacy proficiency is relatively consistent across disciplines, despite minor variations in mean scores. This aligns with Vera and Valencerina (2022), who similarly found that the field of study did not significantly influence proficiency in digital and information literacy skills. They attributed this uniformity to the widespread integration of technology across teacher education curricula, which tends to standardise exposure to digital tools and information literacy practices regardless of specialisation. This observation is particularly relevant for pre-service teachers, who, whether in arts, sciences, or health education, engage with similar digital platforms and resources for research and pedagogical purposes, as evidenced by the comparable mean scores across Departments such as ASSED, STED, EMBS, EFC, and HKHE. The HKHE Department, which emphasises practical and interdisciplinary applications, recorded the highest mean score, while the STED Department, encompassing computer science and other science-related disciplines, recorded the lowest. These patterns suggest that personal engagement with technology may exert a stronger influence on proficiency than disciplinary focus alone.

For teacher education programmes, this finding implies that universal strategies for

enhancing information literacy can be adopted without the need for highly field-specific interventions. Future research could usefully explore whether specific sub-skills, such as bias evaluation, exhibit disciplinary differences when examined independently. Such investigations would help ensure that teacher education continues to address both the universal and the nuanced needs of preparing digitally literate educators capable of thriving in an increasingly complex information environment.

CONCLUSION

The study concluded that pre-service teachers exhibit high proficiency in information literacy when evaluating online teaching and learning resources.

i. The highest proficiency is in online information searching and research.

ii. Skills in evaluating media content and assessing the currency and relevance of information are comparatively weaker.

iii. There are equitable digital competencies among male and female pre-service teachers.

iv. Disciplinary focus does not significantly influence information literacy proficiency.

RECOMMENDATIONS

Based on the findings, it is recommended that:

i. The teacher education programmes should prioritise embedding comprehensive instructional modules focused on critical evaluation of authority, bias, purpose, currency, and media content in the Course (ICT in Education) to strengthen pre-service teachers' analytical skills beyond basic information searching.

ii. Pre-service teachers should be provided with authentic, practice-based learning opportunities that simulate real-world information challenges, requiring nuanced judgment and decision-making, to foster deeper information literacy proficiency.

iii. Equitable access to technology resources and digital literacy should be maintained and expanded to ensure gender neutrality is sustained across diverse educational contexts.

iv. Regular assessments of information literacy skills across different cohorts and regions be conducted to identify emerging gaps and adapt instructional strategies as needed.

v. Further studies should be conducted to understand the dynamics of information literacy, particularly exploring how technological advancements and societal changes influence skills development and gender-related differences over time.

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