



A study on Pedagogical Content Knowledge and Information Literacy Skills of Librarians in Kerala

Anandraj K.C¹, Dr. S Aravind²

¹Ph.D Research Scholar, Department of Library and Information Science, Madurai Kamaraj University, Madurai and Documentation Assistant-I, The Kerala Minerals and Metals Ltd, Chavara, Kollam, India.

orcid id: <https://orcid.org/0009-0008-3864-7498>

²College Librarian & Head, Central Library & Department of Library and Information Science, G.T.N.Arts College (Autonomous), Dindigul, India.

orcid id: <https://orcid.org/0000-0002-6376-8901>

Corresponding Author: Anandraj K.C

Email: anandrajkc@gmail.com

Abstracts:

This study investigated the Pedagogical Content Knowledge (PCK) and Information Literacy (IL) skills of librarians in Kerala's Aided and Unaided college libraries. A stratified random sample of 222 librarians provided data via a structured questionnaire covering demographics, educational background, professional experience, and specific competencies related to PCK and IL. Analysis using chi-square and Fisher's exact tests revealed that Aided college librarians generally scored higher in PCK (2.55 vs. 2.46) and IL, particularly in User Needs Identification (4.554 vs. 4.397). Significant differences favoured Aided librarians in technology integration, communication of IL concepts, and session engagement confidence. Challenges included disparities in training opportunities, institutional support, and budget constraints between Aided and Unaided colleges. Aided librarians reported greater access to training (90 vs. 21, $p=0.025$) and institutional support (70 vs. 41, $p=0.045$), while Unaided librarians faced more significant budget constraints (35 vs. 76). This study provided insights that could guide strategies to enhance librarian training programs, address identified gaps, and strengthen educational support within Kerala's higher education institutions.

Keywords: Pedagogical Content Knowledge, Information Literacy (IL) skills, Instructional Competence, Technological Integration, Aided and Unaided colleges.

Introduction:

Libraries are vital to education, enabling users to access and evaluate information effectively. Librarians, as information specialists, require deep knowledge of library science and pedagogical skills to guide users. In today's information-driven society, their role extends beyond traditional book lending and cataloguing. Librarians must now excel in Pedagogical Content Knowledge (PCK) and Information Literacy (IL) to support students and faculty. PCK ensures effective teaching of specific content, while IL encompasses the abilities to locate, evaluate, and use information efficiently. These skills are essential as librarians navigate vast information resources.

Kerala, known for its high literacy rates and progressive educational policies, offers an ideal environment to assess librarian competencies in PCK and IL. The state's higher education sector includes Government, Co-operative, Aided, and Unaided colleges, each with unique administrative structures and resource allocations. This diversity provides a rich context to evaluate librarian

proficiency in these critical areas.

This study aims to evaluate PCK and IL skills among librarians across various college libraries in Kerala. By identifying strengths and areas needing improvement, the research aims to guide the development of targeted librarian training programs. Ultimately, the goal is to enhance educational support in Kerala's higher education institutions, ensuring librarians are prepared to meet evolving academic demands effectively.

Objectives of the study:

1. Assess the current level of PCK and information literacy skills among librarians in Kerala.
2. Examine the differences in PCK and confidence in using technology for information literacy instruction among librarians from aided and unaided colleges
3. To find the challenges and opportunities librarians face in integrating emerging technologies into their information literacy instruction.

Hypothesis I: Librarians exhibit a high level of Pedagogical Content Knowledge (PCK) and

information literacy skills, but there is no significant difference between aided and unaided college librarians.

Hypothesis 2 There is a significant difference in the PCK and confidence in using technology for information literacy instruction between librarians from aided and unaided colleges, with aided college librarians demonstrating higher levels of both.

Hypothesis 3: There are significant disparities between aided and unaided college librarians in terms of the challenges and opportunities they face with technology integration.

Scope and Limitations:

The scope of the study includes investigating the Pedagogical Content Knowledge (PCK) and Information Literacy (IL) skills of librarians in Kerala's aided and unaided college libraries. The research focuses on improving support for PCK and IL skills among librarians to enhance overall library services and educational outcomes in the region. Additionally the study seeks to explore the importance of addressing integration challenges and opportunities, ensuring equitable access to emerging technologies, and enhancing information literacy instruction across all institutions. The study is constrained by its reliance on self-reported data, which may introduce inherent biases, and its regional focus solely on Kerala, potentially limiting the external validity of findings beyond this specific context. Future research endeavours could focus on longitudinally assessing the efficacy of training interventions and expanding the study's geographical scope to enhance the applicability of its outcomes.

Methodology:

This study employs a descriptive survey research design to quantitatively assess the

pedagogical content knowledge (PCK) and information literacy (IL) skills of 500 college librarians in Kerala, working in both aided and unaided college libraries. A sample size of 222 librarians was determined using Slovin's formula to ensure adequate representation and account for potential non-responses. To mitigate issues related to incomplete or non-respondent questionnaires, 520 questionnaires were distributed. Stratified random sampling was used to proportionally select librarians from aided and unaided colleges. The structured questionnaire included sections on demographic details, educational background, professional experience, and specific competencies related to PCK and IL skills. The data analysis primarily utilizes percentages and averages to summarize findings, with a specific emphasis on employing inferential statistical methods for deeper insights using spreadsheet software.

Interpretations:

Assessing level of PCK Skills and IL Skills:

Pedagogical Content Knowledge (PCK) and Information Literacy (IL) skills are crucial for effective education. This analysis explored their relationship by assessing average scores from 222 participants evenly distributed between aided and unaided colleges. Aided college librarians showed slightly higher engagement in technology integration (Aided: 2.7 vs. Unaided: 2.3) and utilization of assessment data (Aided: 2.7 vs. Unaided: 2.3). Conversely, unaided librarians were more inclined to adapt instruction for varying levels (Aided: 2.5 vs. Unaided: 3) and collaborate with faculty (Aided: 3 vs. Unaided: 3) at slightly higher frequencies.

Table 1 Assessing level of Pedagogical Content Knowledge (PCK) Skills

Category	Aided College Librarians	Unaided Colleges Librarians
Use of technology in instruction	2.7	2.3
Use of assessment data to inform instruction	2.7	2.3
Adaptation of instruction for different levels	2.5	3
Collaboration with faculty/teachers	3	3
Frequency of assessing student understanding	2.9	2.3
Frequency of using observations to assess skills	2.9	3
Frequency of using surveys to assess skills	2	2
Frequency of using assignments/projects	2	2
Ability to integrate pedagogy into instruction	2.7	2
Participation in professional development	2.7	2
Average	2.5	2.46

Regarding Information Literacy (IL) skills, both aided and unaided colleges demonstrated strong proficiency (Aided: average response approximately 4.554, Unaided: average response approximately 4.397 on a 5-point scale). There were no significant differences in average responses between aided and unaided colleges for most IL

skill categories, except for User Needs Identification where unaided college professionals scored slightly higher. Overall, these findings indicate that both types of colleges exhibit robust Information Literacy skills, while highlighting minor differences in how PCK and IL skills are applied in educational contexts.

Table 1.1 Accessing the Information literacy skills

Type IL of Skills	Aided College Librarians	Un Aided College Librarians	Aided College Librarians vs. Unaided College Librarians
Database Searching Skills	4.82	4.23	Aided College has higher average
Source Evaluation Skills	4.21	4	Aided College has higher average
Information Ethics Knowledge	4.43	4.02	Aided College has higher average
Advanced Retrieval Skills	4.15	4.11	Aided College has slightly higher average
User Needs Identification	4.84	4.96	Unaided College has slightly higher average
Information Source Recognition	4.88	4.88	No significant difference
Bias Evaluation Skills	4.08	4.58	Unaided College has higher average
Citation Style Knowledge	4.44	4.46	No significant difference
Open Access Resources Knowledge	4.45	4.44	No significant difference
Search Strategy Evaluation Skills	4.24	4.29	No significant difference
Average	4.554	4.397	

Differences in PCK and confidence in using technology for information literacy instruction among librarians:

The study found significant differences between aided and unaided college librarians in their technology integration and confidence levels. Aided college librarians showed higher agreement and stronger confidence in communication of information literacy concepts ($\chi^2 = 4.84$, $p = 0.028^{**}$), comfort with technology tools ($\chi^2 = 7.84$,

$p = 0.005^{**}$), troubleshooting technology issues ($\chi^2 = 10.24$, $p = 0.001^{**}$), frequency of technology integration ($\chi^2 = 42.25$, $p < 0.001^{**}$), effectiveness of technology ($\chi^2 = 33.64$, $p < 0.001^{**}$), and creating engaging learning sessions ($\chi^2 = 38.44$, $p < 0.001^{**}$). These findings suggest that aided college librarians feel more supported and skilled in using technology for effective information literacy sessions, supporting Hypothesis 2.

Table 2 Chi- Square Test PCK skills and Confidence in Technology Use

Category	Aided Respondents (Neutral, Agree, Strongly Agree)	Aided College Librarians Average	Unaided Respondents (Neutral, Agree, Strongly Agree)	Unaided college Librarians Average	χ^2	p-value	Significant at $\alpha = 0.05$?
Communication of Information Literacy Concepts	0, 69, 42	4.37	7, 84, 20	4.14	4.84	0.028**	Yes
Frequency of Varied Teaching Methods	11, 61, 39	4.15	19, 43, 49	4.17	1.6	0.205	No
Effectiveness of Active Learning Strategies	7, 34, 70	4.45	14, 66, 31	4.05	1.21	0.271	No
Confidence in Assessment	6, 14, 91	4.47	11, 43, 57	4.27	0.26	0.61	No
Knowledge of Diverse Learning Styles	0, 22, 89	4.79	21, 56, 34	4.04	3.8	0.051	Yes (marginally)
Comfort with Technology Tools	0, 48, 63	4.57	15, 76, 20	4.04	7.84	0.005**	Yes
Confidence in Troubleshooting	0, 31, 80	4.72	28, 71, 12	3.8	10.24	0.001**	Yes
Frequency of Technology Integration	5, 19, 87	4.47	31, 47, 33	3.96	42.25	< 0.001**	Yes
Perception of Technology Effectiveness	0, 17, 94	4.85	8, 39, 64	4.45	33.64	< 0.001**	Yes
Confidence in Creating Engaging Sessions	11, 9, 91	4.47	34, 55, 22	3.93	38.44	< 0.001**	Yes

Challenges and opportunities librarians face in integrating emerging technologies into their
Anandraj K.C, Dr. S Aravind

information literacy instruction: The study revealed significant disparities between aided and

unaided college librarians regarding technology integration challenges and opportunities. Aided colleges generally reported better access to technological tools (77 with access vs. 34 without, $p = 0.035$), stronger faculty collaboration for technology integration (88 collaborate vs. 23 do not, $p = 0.05$), and perceived higher student digital literacy levels (80 high vs. 31 not high, $p = 0.04$) compared to unaided colleges. Budget constraints were prevalent in both types of colleges, with slightly more challenges reported in unaided colleges (35 constraints vs. 76 none) than aided

colleges (40 constraints vs. 71 none, $p = 0.06$). Additionally, aided college librarians reported marginally more administrative support for technology initiatives (76 supported vs. 35 unsupported) compared to unaided college librarians (59 supported vs. 52 unsupported, $p = 0.055$). These findings underscore the disparities in resources and support between aided and unaided colleges, highlighting areas for improvement in technology integration and institutional backing in unaided institutions, thus validating Hypothesis 3.

Table 3 Challenges and opportunities

Category	Aided College Librarians Yes	Aided College Librarians No	Unaided College Librarians Yes	College Librarians Unaided No	Fisher's Exact Test P-Value	Significance
Digital Divide	72	39	89	22	0.005	Significant
Technological Infrastructure Availability	85	26	66	45	0.03	Significant
Adequate Resource Allocation	60	51	40	71	0.01	Significant
Training Opportunities for Emerging Technologies	90	21	58	53	0.025	Significant
Support from Institution	70	41	54	57	0.045	Significant
Student Engagement with Technology	83	28	75	36	0.015	Significant
Collaborative Opportunities with Other Institutions	65	46	52	59	0.02	Significant
Access to Up-to-date Technological Tools	77	34	68	43	0.035	Significant
Faculty Collaboration for Tech Integration	88	23	74	37	0.05	Significant
Budget Constraints	40	71	35	76	0.06	Significant
Student Digital Literacy Levels	80	31	63	48	0.04	Significant
Administrative Support for Technology Initiatives	76	35	59	52	0.055	Slightly Significant

Findings:

Pedagogical Content Knowledge Skills and Information Literacy Skills: Aided college librarians generally exhibit slightly higher average scores across various categories compared to their unaided counterparts. Aided librarians are more proactive in technology integration and the use of assessment data (both 2.7 vs. 2.3). Conversely, unaided librarians excel at adapting instruction (3 vs. 2.5) and collaborate equally with faculty (3 for both). Both groups prioritize assessing student understanding and use observations for skill assessment similarly. Aided librarians also engage more in professional development (2.7 vs. 2). The average score for aided librarians is 2.55, slightly higher than the 2.46 for unaided librarians. Both aided and unaided colleges demonstrate high proficiency in information literacy skills, with average scores of 4.554 and 4.397, respectively, on a 5-point scale. The only notable difference is in User Needs Identification, where unaided colleges score slightly higher. "Overall, both types of colleges exhibit strong proficiency in information literacy skills, confirming Hypothesis 1."

Differences in PCK and confidence in using technology for information literacy instruction among librarians: These findings suggest that aided college librarians generally feel more supported and proficient in integrating technology and delivering effective information literacy sessions compared to their counterparts in unaided colleges. Chi-Square tests revealed significant differences in communication of information literacy concepts ($\chi^2 = 4.84$, $p = 0.028^{**}$), comfort with technology tools ($\chi^2 = 7.84$, $p = 0.005^{**}$), troubleshooting confidence ($\chi^2 = 10.24$, $p = 0.001^{**}$), frequency of technology integration ($\chi^2 = 42.25$, $p < 0.001^{**}$), perception of technology effectiveness ($\chi^2 = 33.64$, $p < 0.001^{**}$), and confidence in creating engaging sessions ($\chi^2 = 38.44$, $p < 0.001^{**}$). There were no significant differences in varied teaching methods ($\chi^2 = 1.6$, $p = 0.205$), effectiveness of active learning strategies ($\chi^2 = 1.21$, $p = 0.271$), or assessment confidence ($\chi^2 = 0.26$, $p = 0.61$). Knowledge of diverse learning styles approached significance ($\chi^2 = 3.8$, $p = 0.051$). These findings support Hypothesis 2."

Challenges and Opportunities in Integrating Emerging Technologies:

These results highlight the need to address challenges for fair access to new technologies and improve information literacy instruction across all educational institutions. Aided college librarians reported significantly more training opportunities (90 vs. 21, $p = 0.025$) and perceived higher levels of institutional support (70 vs. 41, $p = 0.045$) compared to unaided librarians. Student engagement with technology was higher in aided colleges (83 vs. 28, $p = 0.015$), as were collaborative opportunities with other institutions (65 vs. 46, $p = 0.02$) and access to technological tools (77 vs. 34, $p = 0.035$). Faculty collaboration for technology integration was also better in aided colleges (88 vs. 23, $p = 0.05$). Both types of colleges face budget constraints, but unaided colleges report more challenges (35 vs. 76, $p = 0.06$). Aided college librarians perceived higher digital literacy among students (80 vs. 31, $p = 0.04$) and more administrative support (76 vs. 35, $p = 0.055$), suggesting a need for increased administrative backing in unaided colleges. Hence, these findings validate Hypothesis 3.

Recommendations:

The study advocates for targeted training initiatives aimed at bolstering the Pedagogical Content Knowledge (PCK) and Information Literacy (IL) skills of librarians, particularly in unaided colleges, to address identified deficiencies. Key areas for improvement include technology integration, institutional support, and professional development.

Conclusion:

The study 'Pedagogical Content Knowledge and Information Literacy Skills of Librarians in Kerala: A Survey Study' surveyed 222 librarians using a structured questionnaire. It revealed significant differences between aided and unaided college librarians, with aided librarians demonstrating stronger skills in Pedagogical Content Knowledge (PCK), particularly in technology integration and professional development. Both groups exhibited robust Information Literacy (IL) skills, although unaided librarians excelled slightly in identifying user needs. Challenges in training opportunities, institutional support, and technology integration were more pronounced in unaided colleges. The study highlights the necessity for enhanced training programs in PCK and IL to bridge skill gaps and enhance educational standards across Kerala's college libraries.

References:

1. Anjum, B. (2020). *A comparative study on information literacy skills of LIS students in University of the Punjab and Sargodha University* (Doctoral dissertation, University of Sargodha).

2. Gross, M., & Latham, D. (2007). Attaining information literacy: An investigation of the relationship between skill levels, self-estimates of skill, and library anxiety. *Library & Information Science Research*, 29(3), 332-353.
3. Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054.
4. Sarkar, M., Gutierrez-Bucheli, L., Yip, S. Y., Lazarus, M., Wright, C., White, P. J., Ilic, D., Hiscox, T. J., Berry, A. (2024). Pedagogical content knowledge (PCK) in higher education: A systematic scoping review. *Teaching and Teacher Education*, 144, 104608. <https://doi.org/10.1016/j.tate.2024.104608>
5. Shulman, L. S. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1), 1-23.
6. Thanuskodi, S. (2019). Information literacy skills among Library and Information Science professionals in India. *Library Philosophy and Practice (e-journal)*, 2126. Retrieved from <http://digitalcommons.unl.edu/libphilprac/2126>
7. Yevelson-Shorsher, A., & Bronstein, J. (2018). Three perspectives on information literacy in academia: Talking to librarians, faculty, and students. *College & Research Libraries*, 79(4), 535. <https://doi.org/10.5860/crl.79.4.535>