Journal of Advances in Developmental Research (IJAIDR)
E-ISSN: 0976-4844 ● Website: www.ijaidr.com ● Email: editor@ijaidr.com

Cyber Resources Knowledge of Higher Secondary Teachers

Prakash V[1], Dheivamani A[2]

[1]Ph.D., Research Scholar, Department of Education, Annamalai University, Annamalainagar.
[2]Assistant Professor, Government College of Education, Vellore.

Abstract:
The effective integration of cyber resources in teaching–learning processes depends largely on teachers' knowledge of digital tools and online educational resources. Cyber Resources Knowledge enables teachers to select, evaluate, and utilize appropriate digital materials for instructional purposes. The present study investigates the level of Cyber Resources Knowledge among Higher Secondary Teachers and examines whether this knowledge differs with respect to gender, age, subject group, and teaching experience. Using a normative survey method, data were collected from 600 Higher Secondary Teachers in Vellore District, Tamil Nadu. Descriptive and inferential statistics were employed for analysis. The findings reveal that teachers possess a moderate level of Cyber Resources Knowledge. Significant differences were found with respect to gender, while age, subject group, and teaching experience did not significantly influence Cyber Resources Knowledge. The study highlights the need for targeted professional development programs to bridge digital knowledge gaps among teachers.

Keywords: Cyber resources knowledge, higher secondary teachers, digital competence, ICT in education.

Introduction

The rapid expansion of information and communication technologies (ICT) has profoundly influenced the education sector, transforming traditional classrooms into technology rich learning environments. Cyber resources such as online learning platforms, digital content repositories, virtual laboratories, and interactive multimedia tools have become integral to modern pedagogy. Teachers' ability to effectively integrate these resources depends significantly on their level of Cyber Resources Knowledge.

Cyber Resources Knowledge refers to teachers' awareness, understanding, and familiarity with various digital tools, online instructional materials, and educational technologies used for teaching and learning. Without adequate knowledge of cyber resources, teachers may underutilize available technologies, resulting in ineffective digital instruction. Therefore, assessing teachers' Cyber Resources Knowledge is crucial for enhancing instructional quality, particularly at the higher secondary level where subject complexity and digital integration are high.

Review of Related Literature

The concept of Cyber Resources Knowledge has gained prominence in recent years due to the rapid digitization of teaching–learning processes across the globe. Cyber Resources Knowledge refers to teachers' awareness, understanding, and cognitive familiarity with digital tools, online platforms, learning management systems, open educational resources (OER), and interactive multimedia applications used for instructional purposes. Recent international research consistently emphasizes that such knowledge forms the foundational layer of teachers' overall digital competence and directly influences effective technology integration in classrooms.

Falloon (2020) proposed the Teacher Digital Competency (TDC) framework, which positions digital knowledge as a prerequisite for meaningful pedagogical and technological integration. According to Falloon (2020), teachers who possess strong digital knowledge are better equipped to select appropriate

cyber resources, evaluate their pedagogical relevance, and adapt them to learners' needs. This framework directly aligns with the present study's focus on Cyber Resources Knowledge as a key determinant of effective digital teaching.

Hodges et al. (2020) critically distinguished between emergency remote teaching and well-designed online learning, highlighting that many teachers lacked sufficient knowledge of cyber resources during the sudden transition to online instruction. Their study revealed that limited familiarity with digital platforms, assessment tools, and online engagement strategies constrained teachers' instructional effectiveness. This finding underscores the importance of Cyber Resources Knowledge in sustaining continuity and quality of instruction during technology-mediated teaching.

OECD reports provide strong empirical support for the role of teachers' digital knowledge in contemporary education systems. The OECD Digital Education Outlook 2023 emphasized that teachers' uneven knowledge of digital tools remains a major barrier to effective digital transformation in schools (OECD, 2023). Similarly, the OECD (2025) report on preparing teachers for digital education highlighted that professional learning focused on building teachers' cyber resource knowledge significantly enhances their confidence and classroom technology use. These findings reinforce the need to examine Cyber Resources Knowledge as a distinct and measurable construct.

Recent empirical studies have also explored demographic variations in Cyber Resources Knowledge. Althubyani (2024), in a mixed-methods study of secondary school teachers, found that teachers' knowledge of digital resources significantly predicted their technology integration practices. The study further reported a significant gender difference in digital knowledge levels, with male teachers demonstrating higher familiarity with advanced digital tools. This evidence directly supports the inclusion of gender as a variable in the present study.

Smestad (2023) conducted a systematic review on teachers' digital competence and identified Cyber Resources Knowledge as a core domain influencing instructional decision-making. The study concluded that teachers with stronger digital knowledge were more likely to integrate technology purposefully rather than superficially. This finding highlights the role of knowledge not merely as awareness, but as a driver of meaningful utilization of cyber resources.

Contrary to common assumptions, several studies suggest that age and teaching experience do not necessarily determine teachers' level of Cyber Resources Knowledge. Kimmons and Hall (2022) reported that access to professional development opportunities had a greater impact on teachers' digital knowledge than years of teaching experience. Similarly, Petko (2021) argued that continuous learning and contextual support play a more critical role than demographic factors in shaping teachers' digital knowledge.

The reviewed literature from 2020 to 2025 reveals that Cyber Resources Knowledge is a pivotal component of teachers' digital competence and is influenced more by access to training and institutional support than by age or teaching experience. However, variations related to gender and contextual factors remain underexplored, particularly in the Indian higher secondary education context. This gap justifies the present investigation into the level and determinants of Cyber Resources Knowledge among Higher Secondary Teachers in Vellore District.

Objectives of the Study

1.To study the level of Cyber Resources Knowledge among Higher Secondary Teachers.
2.To find out whether there is a significant difference in Cyber Resources Knowledge with respect to gender.
3.To examine the difference in Cyber Resources Knowledge with respect to age.
4.To analyze the difference in Cyber Resources Knowledge with respect to subject group.
5.To determine whether teaching experience significantly influences Cyber Resources Knowledge.

Hypotheses of the Study

1.There is no significant difference in Cyber Resources Knowledge among Higher Secondary Teachers with respect to gender.
2.There is no significant difference in Cyber Resources Knowledge among Higher Secondary Teachers with respect to age.
3.There is no significant difference in Cyber Resources Knowledge among Higher Secondary Teachers with respect to subject group.
4.There is no significant difference in Cyber Resources Knowledge among Higher Secondary Teachers with respect to teaching experience.

Methodology

Research Design

The study adopted a normative survey method to collect data from a large sample at a single point in time.

Sample

The sample consisted of 600 Higher Secondary Teachers working in schools of Vellore District, Tamil Nadu. Simple random sampling technique was used.

Tool Used

Cyber Resources Knowledge Scale developed and validated by the investigators was used for data collection.

Statistical Techniques

Mean, Standard Deviation, t test, and One way ANOVA were used for data analysis.

The Teachers' Cyber Resources Knowledge Scale has been administered to 600 Higher Secondary Teachers. The data were collected. The Mean and Standard deviation were calculated for the entire sample and its sub-samples and are given in Table No.1.

Table No.1-

The Mean and Standard Deviation of Higher Secondary Teachers' Cyber Resources Knowledge scores

Sub Groups		**N**	**Mean**	**SD**
Entire Sample		600	21.43	5.876
Gender	Male	209	22.35	6.554
	Female	391	20.93	5.424
Age	Below 29 years	78	22.35	5.888
	30-39 years	102	22.37	5.343
	40-49 years	181	20.80	5.698
	50-55 years	192	21.16	6.378
	Above 55 years	47	21.36	5.264
Group	Arts	206	21.48	5.706
	Science	240	21.49	6.229
	Mathematics and Computer Science	154	21.25	5.561
Teaching Experience	1-10years	291	21.39	5.754
	11-20 years	156	21.25	5.861
	21 years and above	153	21.67	6.147

Null Hypothesis

There is no significant difference in Cyber Resources Knowledge among the Higher Secondary Teachers with respect to their Gender.

In order to test the above Null hypothesis 't' value is calculated.

Table No. 2
Significance of difference in Cyber Resources Knowledge among the Higher Secondary Teachers with respect to their Gender

Sub Group	N	Mean	SD	t	Significance at 0.05 level
Male	209	22.35	6.554	2.68	Significant
Female	391	20.93	5.424		

To test this hypothesis, a t-test was employed. The results indicate that male teachers (N = 209, Mean = 22.35, SD = 6.554) have a higher mean score in Cyber Resources Knowledge than female teachers (N = 391, Mean = 20.93, SD = 5.424). The obtained t value is 2.68, which is significant at the 0.05 level.
Since the calculated t value is significant, the null hypothesis is rejected. This finding reveals that gender has a statistically significant influence on Cyber Resources Knowledge among Higher Secondary Teachers.
It may be inferred that male teachers possess comparatively higher knowledge of cyber resources than female teachers. This difference could be attributed to factors such as variation in exposure to digital tools, access to technology, opportunities for technical training, or frequency of technology use.

Null Hypothesis
There is no significant difference in Cyber Resources Knowledge among the Higher Secondary Teachers with respect to their Age.
In order to test the above Null hypothesis 'F' value is calculated.

Table No. 3
Significance of difference in Cyber Resources Knowledge among the Higher Secondary Teachers with respect to their Age

	Sum of Squares	df	Mean Square	F	Significance at 0.05 level
Between Groups	242.994	4	60.749	1.768	Not Significant
Within Groups	20441.779	595	34.356		
Total	20684.773	599			

To test this hypothesis, a one-way ANOVA was conducted. The obtained F value is 1.768, which is not significant at the 0.05 level.
This result indicates that the mean Cyber Resources Knowledge scores of Higher Secondary Teachers do not differ significantly across different age groups. Hence, the null hypothesis is accepted.
It can be inferred that age does not have a statistically significant influence on the level of Cyber Resources Knowledge among Higher Secondary Teachers.
Null Hypothesis
There is no significant difference in Cyber Resources Knowledge among the Higher Secondary Teachers with respect to their Group.
In order to test the above Null hypothesis 'F' value is calculated.

Table No. 4
Significance of difference in Cyber Resources Knowledge among the Higher Secondary Teachers with respect to their Group

	Sum of Squares	df	Mean Square	F	Significance at 0.05 level
Between Groups	6.244	2	3.122	0.091	Not significant
Within Groups	20678.529	597	34.637		
Total	20684.773	599			

To examine this hypothesis, a one-way ANOVA was carried out. The obtained F value is 0.091, which is not significant at the 0.05 level.
This finding shows that the mean Cyber Resources Knowledge scores of Higher Secondary Teachers do not differ significantly across different teacher groups. Therefore, the null hypothesis is accepted.
It can be inferred that group differences do not have a statistically significant influence on Cyber Resources Knowledge among Higher Secondary Teachers.

Null Hypothesis

There is no significant difference in Cyber Resources Knowledge among the Higher Secondary Teachers with respect to their Teaching Experience.
In order to test the above Null hypothesis 'F' value is calculated.

Table No. 5
Significance of difference in Cyber Resources Knowledge among the Higher Secondary Teachers with respect to their Teaching Experience

	Sum of Squares	df	Mean Square	F	Significance at 0.05 level
Between Groups	14.523	2	7.261	0.210	Not Significant
Within Groups	20670.250	597	34.624		
Total	20684.773	599			

To test this hypothesis, a one-way ANOVA was conducted. The analysis yielded an F value of 0.210, which is not significant at the 0.05 level.
This result indicates that the mean Cyber Resources Knowledge scores of Higher Secondary Teachers do not differ significantly across different levels of teaching experience. Hence, the null hypothesis is accepted.
It can be concluded that teaching experience does not have a statistically significant influence on Cyber Resources Knowledge among Higher Secondary Teachers.

Findings of the Study

1.Higher Secondary Teachers possess a moderate level of Cyber Resources Knowledge.
2.Gender significantly influences Cyber Resources Knowledge, with male teachers scoring higher.
3. Age does not significantly influence Cyber Resources Knowledge.
4. Subject group does not significantly influence Cyber Resources Knowledge.
5.Teaching experience does not significantly influence Cyber Resources Knowledge.

Educational Implications

The findings highlight the necessity of systematic digital literacy training for teachers, with special attention to reducing gender based disparities. Regular workshops, hands on training sessions, and institutional support can enhance teachers' Cyber Resources Knowledge, leading to more effective digital pedagogy.

Conclusion

Cyber Resources Knowledge is a critical component of teachers' digital competence in the modern educational landscape. The present study concludes that while Higher Secondary Teachers demonstrate a moderate level of knowledge, demographic variables such as age, subject group, and teaching experience do not significantly influence this competence. Gender differences, however, warrant focused intervention. Strengthening teachers' knowledge of cyber resources through continuous professional development will enhance the quality of technology enabled education.

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