IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Teachers' Competence In Assistive Technology: A Study On Professional Development Needs In Special Education

Dr.Asha Sharma (Associate professor), Research Guide

ABSTRACT

This study highlights the importance of assistive technology (AT) in special education to improve learning outcomes for students with disabilities, while also acknowledging the critical role that teachers play in effectively integrating these technologies. This study aimed to analyze special education teachers' perceptions of their knowledge and competence in using assistive technology, assess their interest in professional training, and determine their preferred methods of learning about assistive technology. This study adopted a quantitative design, using an online survey to collect data from special education teachers in the Jaipur district, and analyzed the data through descriptive statistics using SPSS. The study found that teachers had a basic understanding and moderate competence in assistive technology, had a strong interest in further professional development, especially in communication-related tools, and preferred workshops, conferences, and self-directed learning. This study highlights the need for targeted, hands-on professional development and a comprehensive assistive technology strategy to improve teachers' practical skills and use of assistive technology, especially during the summer vacation. These findings suggest that improved professional development and strategic support can significantly improve teachers' effectiveness in using AT, leading to better educational outcomes for students with disabilities, and call for future research to explore the impact of specific training interventions on AT use.

Keywords: Special Education, Teachers Competence, Teachers Perceptions, Professional Development, Assistive Technology.

INTRODUCTION

Integrating assistive technology (AT) into special education is increasingly important for improving learning outcomes for students with disabilities (Alhassan & Verma, 2024). Assistive technologies range from simple tools, such as text-to-speech software, to more complex systems, such as adaptive communication devices, designed to help students overcome barriers to learning. However, the successful implementation of

these technologies often depends on the knowledge and abilities of the educators who use them (Haleem et al., 2022). Special education teachers play a key role in identifying, selecting, and using appropriate AT tools, but research suggests that many educators may feel ill-prepared or lack confidence in their ability to effectively integrate these technologies into their teaching practices (Alsolami, 2022; Haleem et al., 2022). This study aimed to analyze special education teachers' perceptions of their knowledge and abilities to use AT and explore their interest in further professional development in this area.

This study is guided by three key research questions and aims to deepen the understanding of how special education teachers perceive their expertise and preparedness to use assistive technology. First, this study explores teachers' self-assessed knowledge and competence regarding assistive technology, seeking to understand their confidence in integrating these tools to support their students. Second, this study examines whether special education teachers are interested in receiving specialized training to improve their skills and effectiveness in using assistive technology. Finally, this study investigates how and when teachers would like to learn about assistive technology. These questions will provide insight into the current state of assistive technology training and knowledge in special education and identify potential gaps that need to be addressed.

The rationale for this study stems from the growing demand for inclusive education and the increasing availability of assistive technologies that can help special education teachers support students with diverse learning needs. Despite the potential benefits of AT, previous research has highlighted barriers such as lack of training, limited resources, and inadequate professional development opportunities. By examining special education teachers' perceptions, this study aims to inform policy and practice, providing recommendations for more targeted professional development and support structures that will enable educators to confidently use AT in their classrooms. Ultimately, this study aims to increase the capacity of special education teachers to improve learning outcomes for students with disabilities.

THEORETICAL REVIEW

Teachers' Willingness to Integrate AT Tools

The literature on teacher willingness to integrate AT into special education classrooms reveals a complex interplay of factors that influence adoption. While most studies (e.g., Charitaki et al., 2022; Gilson & Biggs, 2023) highlight special education teachers' positive attitudes toward AT, willingness is often related to their confidence, knowledge, and perceived ability to use these tools. Teachers who receive adequate training and support are more likely to accept AT, recognizing its benefits for improving student engagement, communication, and learning. However, barriers such as inadequate training, lack of resources, and time constraints may undermine their willingness to adopt these technologies. In addition, teachers' perceptions of AT's relevance to student needs and the effectiveness of professional development programs can also

significantly influence their willingness to integrate AT tools (Amir, 2023). Therefore, promoting teacher willingness to use AT requires a focus on improved training, resources, and ongoing professional support.

Competency-based Teacher's Training

The literature on special education teachers' competency-based training in using AT emphasizes the need for targeted, skills-focused professional development to increase their proficiency in AT integration. Research consistently shows that teachers who receive professional practice training demonstrate greater confidence and competency in utilizing AT to meet the diverse needs of students with disabilities. Competency-based approaches, which focus on developing practical, adaptable skills rather than general knowledge, are more effective in developing teachers' competency in selecting and implementing appropriate AT tools (Ahmed et al., 2022). Additionally, training programs that provide ongoing support, such as mentoring and coaching, further enhance teachers' ability to tailor AT solutions to individual student needs (Woodcock et al., 2022). The literature emphasizes that without adequate competency-based training, many teachers struggle with both the technical and pedagogical aspects of AT, limiting its full potential in special education classrooms.

RESEARCH METHODOLOGY

Research Design: This study utilized a quantitative research design employing a survey approach to efficiently collect structured data on teachers' self-assessed knowledge, competencies, and training perceptions related to AT.

Survey Instrument: The survey instrument used in this study was adopted from Almethen (2017). The questionnaire was divided into three sections: demographic information (6 items), knowledge and experience in AT (4 items), competencies and skills in AT (11 items), and AT training and development needs (4 items). The instrument's validity and reliability had been previously established, making it suitable for this research.

Participants: The study's participants were special education teachers from schools in the Jaipur District that serve students with disabilities. Of the 89 initial respondents, 7 incomplete responses were excluded, resulting in a final sample size of 82 valid responses for analysis.

Data Collection Procedure: Data were collected using an online survey hosted on the Qualtrics Survey platform. After obtaining permission from the participating schools, teachers' contact information was gathered, and survey links were administered via WhatsApp for convenience.

Data Analysis: The survey data were analyzed using the Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive statistics were employed to examine the data, with a focus on patterns in teachers' knowledge, competencies, and professional development related to AT.

Ethical Considerations: This study adhered to ethical guidelines to ensure the confidentiality and protection of participants. Participants' anonymity and confidentiality were protected by not collecting any personally identifiable information, and participants were fully informed of their rights. Participation was voluntary, with no consequences for non-participation or incomplete responses.

ANALYSIS AND RESULTS

Analyzing the Demographic Information

Table 1 – Analysis of Respondents' Demographic Information

Description		Frequency	Percent
Gender	Male	34	41.5%
	Female	48	58.5%
Age	30 years and younger	15	18.3%
	31-40 years	40	48.8%
	More than 40 years	27	32.9%
Qualification	Bachelor	31	37.8%
	Master	14	17.1%
	Doctorate	9	11.0%
	Other	28	34.1%
Special Education Experience	Less than 5 years	23	28.0%
	5-10 years	39	47.6%
	More than 10 years	20	24.4%
Teaching Grade	Pre-school	12	14.6%
	Elementary level	33	40.2%
	Middle school	21	25.6%
	High school	16	19.5%
School location	Rural	25	30.5%
	Sub-urban	38	46.3%
	Urban	19	23.2%

The demographic data reflects a diverse group of respondents, with a majority being female (58.5%) and the largest age group falling between 31-40 years (48.8%). In terms of qualifications, most participants hold a Bachelor's degree (37.8%), followed closely by those with "Other" qualifications (34.1%). Regarding special education experience, nearly half (47.6%) have 5-10 years of experience. The respondents teach across various grade levels, with the largest proportion teaching at the elementary level (40.2%). Geographically, the highest percentage work in suburban schools (46.3%), while rural and urban schools account for 30.5% and 23.2% of the sample, respectively.

Analyzing Research Question 1

The first question this study seeks to answer is whether special education teachers, based on their self-assessed knowledge and competencies in assistive technology (AT), feel confident in integrating AT tools to support their students. To explore this, descriptive statistical analysis was conducted, as shown in Tables 2 and 3 below:

Table 2 – Analysis of Respondents' Self-assessed Knowledge in AT

Description		Frequency	Percent	Mean ± SD
Number of AT programs attended	0 - 2	46	56.1%	2.402±1.962
	3 - 5	31	37.8%	
	More than 5	5	6.1%	
Familiarity with AT	Neither Theoretical nor Practical	23	28.0%	1.171±0.953
	More Theoretical, Less Practical	30	36.6%	
	More Practical, Less Theoretical	21	25.6%	
	Both Theoretical & Practical	8	9.8%	
Nature of AT tools used	Low-tech tools	53	64.6%	1.402±0.585
	Mid-tech tools	25	30.5%	
	High-tech tools	4	4.9%	
Frequency of AT use	Never	12	14.6%	2.573±0.982
	Rarely	26	31.7%	
	Sometimes	31	37.8%	
	Often	11	13.4%	
	Always	2	2.4%	

The table provides insights into special education teachers' self-assessed knowledge of assistive technology (AT). Over half (56.1%) have attended 0-2 AT programs, with a mean of 2.402±1.962, indicating relatively low formal exposure. In terms of familiarity, the largest group (36.6%) reports having more theoretical than practical knowledge, with a mean of 1.171±0.953, suggesting limited hands-on experience. Most teachers (64.6%) use low-tech tools, and very few (4.9%) use high-tech tools, reflecting a mean of 1.402±0.585. Regarding the frequency of AT use, a significant portion (37.8%) reports using AT "sometimes", while only 2.4% use it "always", with an overall mean of 2.573 (SD 0.982). This analysis indicates that while teachers are somewhat familiar with AT, there is a lack of deep practical experience and consistent use, especially with advanced tools.

Table 3 – Analysis of Respondents' Competencies in AT

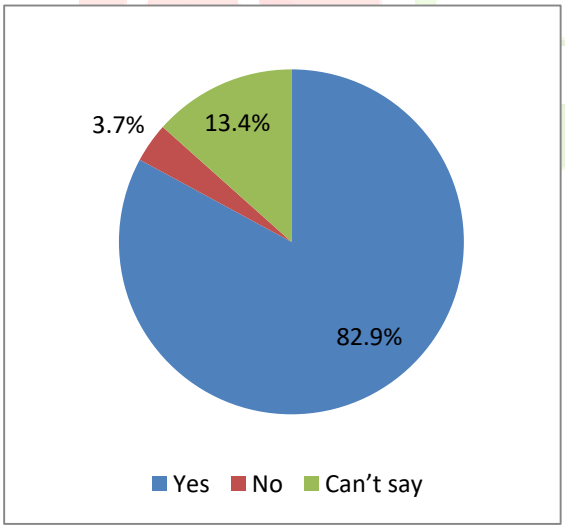
	Statements	Mean	SD
1	I am familiar with key concepts, terminology, and definitions related to AT in special education.	3.69	1.07
2	I am confident in my ability to select, implement, and operate software programs aligned with students' disabilities and their Individualized Education Program (IEP) goals.	3.14	1.18
3	I can conduct assessments to determine appropriate AT solutions based on the specific needs and functional capabilities of students with disabilities.	3.22	1.16
4	I can design and adapt the classroom environment to ensure accessibility and optimal use of AT for students with disabilities.	3.83	1.18
5	I can evaluate the effectiveness of AT in achieving educational goals and improving student outcomes for students with disabilities.	3.07	1.14
6	I understand that AT devices range from low-tech to high-tech solutions and can apply this knowledge to meet diverse student needs.	3.43	1.11
7	I can confidently identify and recommend a range of AT devices (low-tech, mid-tech, high-tech) based on the unique needs and goals of students with disabilities.	3.39	1.22
8	I am proficient in operating a variety of AT devices (low-tech, mid-tech, high-tech) to support the educational and functional needs of students with disabilities.	2.98	1.09
9	I follow a structured process to ensure the correct and consistent implementation of AT	3.29	1.15

	in alignment with students' IEP goals.		
10	I actively seek and utilize resources for ongoing professional development related to AT to enhance my competencies and keep updated on new developments.	3.52	1.08
11	I actively collaborate with IEP team members, including parents and specialists, to select, implement, and review the use of AT for students with disabilities.	3.45	1.16
	Overall	3.31	1.12

The analysis of teachers' competencies in AT reveals a moderate level of confidence and proficiency. Teachers express the strongest competence in understanding key AT concepts and adapting the classroom environment to support AT use, with mean scores of 3.69 and 3.83, respectively. However, their confidence in selecting and operating AT software and conducting assessments to identify appropriate AT solutions is lower, with mean scores around 3.14 and 3.22. The ability to evaluate AT effectiveness (mean 3.07) and proficiency in operating a variety of AT devices (mean 2.98) are areas of concern, reflecting a need for further development. The overall mean score of 3.31 indicates that while teachers are familiar with AT, there is room for improvement, particularly in practical application and advanced device operation. Regular professional development and collaboration with IEP teams are areas where teachers demonstrate moderate engagement, which can be leveraged to strengthen their overall AT competency.

Analyzing Research Question 2

The second question this study seeks to answer is whether special education teachers have an interest in specialized training to enhance their skills and effectiveness in using AT. The results of the analysis are presented using Figures 1 and 2.



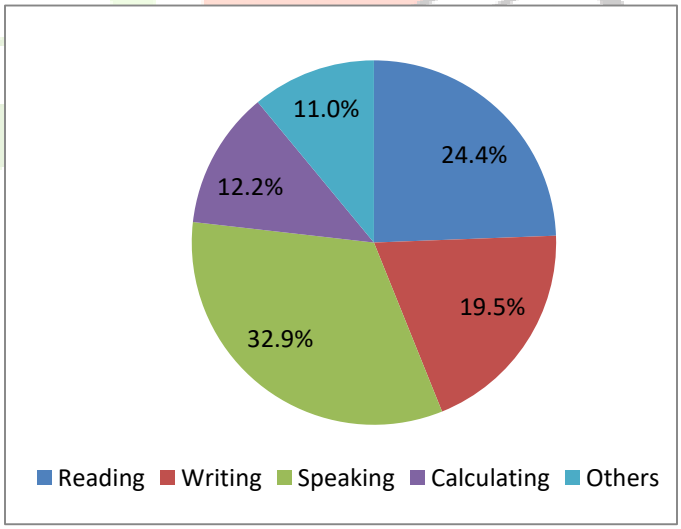


Fig.1 - Interest in receiving more AT training **Fig.2 - Area of Interest**

The analysis of teachers' interest in specialized training for AT (Fig.1) reveals a strong desire for further development, with 82.9% expressing interest in receiving more training, while only 3.7% are not interested, and 13.4% are undecided. Figure 2 highlights that teachers are most interested in using AT tools to support speaking (32.9%), followed by reading (24.4%), writing (19.5%), calculating (12.2%), and other areas

(11.0%). This indicates that teachers recognize the need for enhanced skills, particularly in communication-related areas, and are keen to improve their effectiveness in using AT to support diverse student needs.

Analyzing Research Question 3

The third and last question this study seeks to answer is regarding the preference of methods through which special education teachers wish to learn about AT. The results of the analysis are presented using Figures 3 and 4.

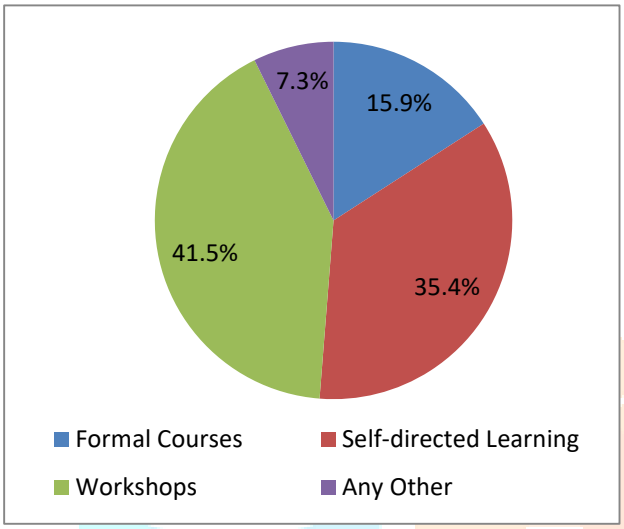


Fig.3 – Preferred Methods

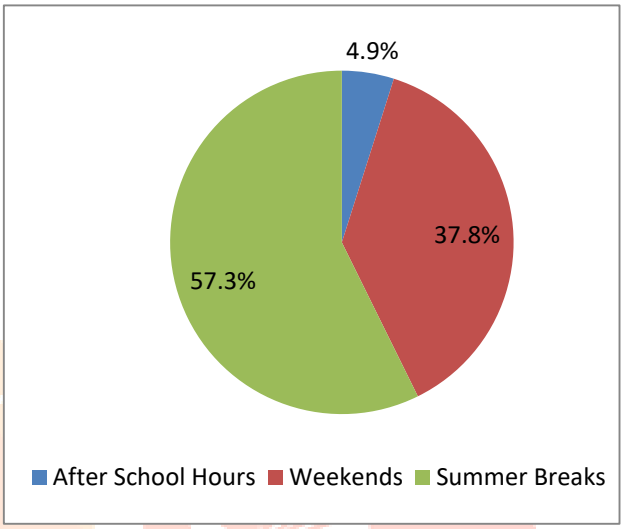


Fig.4 – Preferred Time

The analysis (Fig.3) reveals that special education teachers prefer learning about assistive technology (AT) primarily through workshops or conferences (41.5%), followed by self-directed learning (35.4%) and formal professional development courses (15.9%). A small portion (7.3%) prefers other methods. Regarding the timing of learning (Fig.4), the majority (57.3%) prefer to engage in training during summer breaks, while 37.8% favor weekends, and only 4.9% prefer after-school hours. This suggests that teachers value interactive, hands-on learning experiences and prefer scheduling their professional development during extended breaks, such as summer, when they have more time and flexibility.

DISCUSSION OF FINDINGS

The findings of this study align with previous research, which highlights that special education teachers generally possess moderate competencies in AT, particularly in areas like classroom arrangement and understanding basic AT concepts and devices (Alsolami, 2022; Gilson & Biggs, 2023). Similar to earlier studies (such as Ng et al., 2023; Woodcock et al., 2022), teachers demonstrated a desire to improve their skills, especially in communication-related AT, which is crucial for students with disabilities. The preference for workshops and self-directed learning as training methods echoes the findings of studies (such as Alsolami, 2022; Woodcock et al., 2022) highlighting that hands-on, interactive learning opportunities were most effective for AT training. Additionally, the preference for professional development during

summer breaks or weekends aligns with research by Alsolami (2022), which suggests that teachers are more receptive to training when it fits into their personal schedules, allowing for deeper engagement and reflection. Overall, the study underscores a clear need for targeted, flexible AT training to enhance teachers' confidence and effectiveness in supporting diverse student needs.

RECOMMENDATIONS

1) Special education teachers must be provided with targeted, hands-on professional development, focusing on AT tools for communication through workshops and conferences.
2) A comprehensive AT strategy must be implemented through government and institutional collaboration, offering ongoing, individualized training during summer breaks to enhance teachers' competencies with diverse AT devices.

CONCLUSION

To conclude, this study highlights that while special education teachers have a basic understanding and moderate competency in AT, there is still significant opportunity to improve their skills, particularly in communication-related AT tools. The findings highlight the need for targeted hands-on professional development, such as workshops and conferences, to address gaps in practical knowledge and application. Additionally, the study calls for the development of a comprehensive AT strategy driven by governments and education agencies that provides ongoing individualized training during periods of lower workload, such as summer vacation. The implications of this study suggest that improved professional development and strategic support could significantly increase teachers' effectiveness in using AT, thereby improving educational outcomes for students with disabilities. Future research could further explore the impact of specific training interventions on teachers' actual use of AT and their ability to effectively support the needs of diverse students.

REFERENCES

- Ahmed, S.K., Jeffries, D., Chakraborty, A., et al. (2022). Teacher professional development for disability inclusion in low- and middle-income Asia-Pacific countries: An evidence and gap map. Campbell Systematic Reviews, 18(4): e1287.
- Alhassan, K.Y. and Verma, S. (2024). Technology in Special Education: Integration of Assistive Technology and Educational Apps. International Journal of Social Impact, 9(1): 65-73.
- Almethen, M. (2017). Saudi special education teachers' knowledge, skills, and professional development needs of assistive technology in the classroom. Master's thesis: California State University, San Bernardino.

- Alsolami, A.S. (2022). Teachers of Special Education and Assistive Technology: Teachers' Perceptions of Knowledge, Competencies, and Professional Development. Sage Open, DOI: 10.1177/21582440221079900.
- Amir, A. (2023). A Holistic Model for Disciplinary Professional Development - Overcoming the Disciplinary Barriers to Implementing ICT in Teaching. Education Sciences, 13: 1093.
- Charitaki, G., Kourti, I., Gregory, J.L., et al. (2022). Teachers' Attitudes Towards Inclusive Education: A Cross-National Exploration. Trends in Psychology, DOI: 10.1007/s43076-022-00240-0.
- Gilson, C.B. and Biggs, E.E. (2023). Perspectives of special education teachers and paraprofessionals on working together in general education settings. International Journal of Inclusive Education, DOI: 0.1080/13603116.2023.2216206.
- Haleem, A., Javaid, M., Qadri, M.A., et al. (2022). Understanding the role of digital technologies in education: A review. Sustainable Operations and Computers, 3: 275-285.
- Ng, D.T.K., Leung, J.K.L., Su, J., et al. (2023). Teachers' AI digital competencies and twenty-first century skills in the post-pandemic world. Educational Technology Research and Development, 71: 137-161.
- Woodcock, S., Sharma, U., Subban, P., et al. (2022). Teacher self-efficacy and inclusive education practices: Rethinking teachers' engagement with inclusive practices. Teaching and Teacher Education, 117: 103802.