USING DIGITAL TOOLS TO DEVELOP READING SKILLS AMONG STUDENTS WITH MILD INTELLECTUAL DISABILITIES: TEACHERS' PERSPECTIVES

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ABSTRACT

Developing reading skills in students with intellectual disabilities (ID) presents a unique challenge due to their varying levels of cognitive and linguistic capabilities. Digital tools offer adaptive learning environments that can be customized to meet the individual needs of students with intellectual disabilities. The objective of the study is to explore the teacher's opinion about digital tools to develop reading skills among students with mild intellectual disabilities. Researchers employed survey method to gather data from teachers working in government special education institutions in Punjab. A questionnaire was designed to be easy to administer and understand, with close-ended questions using a Likert scale format. Reliability coefficients of questionnaire is 913. The structure of the questionnaire was divided into three distinct sections, each tailored to gather specific information. The survey was distributed electronically to ensure broad reach and convenience for respondents. The data analysis was conducted using SPSS version 21, which facilitated detailed statistical analysis. The sample of this study consisted of 267 teachers who engaged in instructing students with intellectual disabilities. 55.8% respondents responded that digital tools are "Essential" but there is a limited use of these tools in their institutions. Textbooks were the most frequently used resource (55.8%), underscoring their dominance in teaching Urdu reading skills. Flashcards were the second most common resource (19.5%), likely used to support vocabulary and phonemic awareness. Interactive activities (12.6%) and illustrated storybooks (7.9%) were used less frequently, while digital tools (4.2%) were the least utilized. A smaller proportion of teachers used digital software monthly (23 teachers, 8.6%) or weekly (13 teachers, 4.9%). Notably, no teachers (0.0%) reported using digital software daily for teaching Urdu reading. The findings highlight a gap in the integration of modern, student-centered strategies and resources that could potentially improve reading outcomes for students with intellectual disabilities. The study emphasized the importance of structured, interactive learning environments where teachers facilitate digital literacy instruction rather than relying solely on self-directed student engagement.

Keywords: *Digital Software, Intellectual Disabilities, Urdu Reading Skills.*

INTRODUCTION

Intellectual disabilities are often characterized by limitations in both intellectual functioning and adaptive behavior, which includes social, practical, and academic skills (American Association on Intellectual and Developmental Disabilities, 2010).

Because reading needs competence in language processing, memory, attention, and problem-solving areas where these students frequently struggle, it can be a challenging and drawn-

out process for students with ID. (Browder et al., 2009).

Digital literacy development is frequently supported by features found in educational software and digital platforms created for students with mild intellectual disabilities.

To assist students in learning how to utilize digital devices and navigate online settings, for instance, numerous apps include interactive lessons, visual aids, and step-by-step directions. (McNaughton & Light, 2013).

A variety of cognitive and language barriers prevent students with mild intellectual disabilities from acquiring reading skills at the same rate as their peers who are developing normally.

The most significant obstacle is learning phonological awareness, which is the capacity to identiy and work with language sounds and is an essential precondition for reading. (Baker et al., 1998).

A variety of cognitive and learning difficulties that impact their capacity to process information, construct language, and learn to read are experienced by children with mild intellectual disabilities. (Wang et al., 2022). These difficulties include memory problems, trouble thinking abstractly, and slower processing speeds, all of which lead to delays in the acquisition of literacy. (Campbell, 2021). For instance, children with intellectual disabilities often struggle with phonemic awareness, which is crucial for developing decoding skills needed for reading (Lonigan, Burgess, & Schatschneider, 2018).

Literature review

Students with intellectual disabilities (ID) face a variety of challenges when developing reading skills. These challenges stem from deficits in memory, processing speed, and other cognitive areas critical for reading comprehension (Browder et al., 2012).

For students with intellectual disabilities, assistive technologies often focus on improving communication, reading, and social interaction. Devices such as augmentative and alternative communication (AAC) systems help students who have difficulty with verbal communication to express themselves through symbols, pictures, or speech-generating devices (McNaughton & Light, 2013).

In the Nineteen Eighties and 1990s, the advent of private computer systems into faculties marked a turning factor in unique education. Early academic software, along with LOGO and early literacy programs, furnished interactive getting to know environments however have been nonetheless restrained of their cap potential to deal with the unique demanding situations confronted via way of means of college students with highbrow disabilities (Heimann et al., 2019). As era advanced, so did the complexity and competencies of tutorial software. Programs started incorporating extra adaptive features, along with individualized getting to know paths and real-time feedback, which helped to tailor the getting to know enjoy to the specific wishes of every student (Rogers & Gronseth, 2021).

The 2000s noticed a significant increase in the improvement of assistive and academic software program, thanks to advancements in artificial intelligence (AI) and machine learning. This technology enabled software program to evolve dynamically to the student`s progress, supplying differentiated coaching primarily based totally on real-time data (McNaughton & Light, 2013). The rise of mobile technologies and apps further expanded access to educational software, allowing students with intellectual disabilities to engage in learning both inside and outside the classroom (Bouck, Shurr, & Park, 2020).

For students with poor language proficiency, AAC tools have been demonstrated to dramatically enhance social interaction and communication, enabling them to engage more fully in social and academic activities (McLeod et al., 2020).

Technology has several uses in special education, including boosting student communication and social engagement as well as learning results (Bouck et al., 2021). Computers and tablets, for example, can provide individualized learning experiences that are catered to each student's cognitive capacity. These kinds of digital resources offer lessons that are both interactive and flexible, enabling students to advance at their own speed (Edyburn, 2013).

The integration of era into unique training has dramatically modified how students with intellectual disabilities have interaction with educational content. Initially, era`s function in training became constrained to primary equipment together with audio-visible aids, however advances in virtual era have caused the introduction of state-of-the-art equipment and software program designed especially for students with intellectual disabilities with unique needs (Haleem et al.,

2022). The improvement of analyzing abilities generally takes place in a sequence of stages, from emergent literacy to fluent analyzing. According to Chall`s model (1983), regular readers development via six stages: pre-reading, initial reading or decoding, fluency, learn to read multiple viewpoints and construction and reconstruction. For students with intellectual disabilities however, this development can be slower and extra variable, with a few students with intellectual disabilities requiring extra time in every stage, and others going through huge limitations that save you them from accomplishing better stages (Joseph & Seery, 2004).

There are several advantages related to the usage of digital software program in reading development. One of the maximum tremendous is the capacity to offer differentiated instruction. Digital reading applications can cater to the numerous desires of students through presenting content material at special stages of difficulty, permitting every scholar to work at their personal pace. This personalized method has been proven to enhance reading outcomes, in particular for students who struggle with conventional techniques of instruction (Graham et al., 2021).

Reading comprehension is the ultimate purpose of reading instruction. It includes now no longer most effective expertise the literal that means of a textual content however additionally interpreting and analyzing information to attract inferences, make connections, and seriously examine content material. Comprehension calls for the combination of a couple of reading skills, consisting of vocabulary knowledge, heritage knowledge, and the capacity to apply cognitive techniques like summarizing, predicting, and questioning (Hausheer et al., 2011).

Phonics refers back to the technique of coaching reading with the aid of using connecting sounds (phonemes) with letters or groups of letters (graphemes). It performs a foundational function in mastering to read, especially for starting readers. Phonics education allows students apprehend how letters integrate to shape phrases, allowing them to decode unusual phrases with the aid of using sounding them out (Abbott, Dornbush, Giddings, & Thomas, 2012).

Vocabulary expertise is a key aspect in reading comprehension and general literacy development. Without a robust vocabulary, Students with intellectual disabilities can also additionally war to apprehend the means of the text, limiting their ability to fully engage with and learn from what they read. Vocabulary education, specially withinside the early grades, is regularly unnoticed or left to chance, going on simplest by the way thru sports like studying aloud (Duke & Block, 2012). Digital technology additionally provides enormous advantages in teaching reading capabilities through multimodal instruction, that may advantage students with intellectual disabilities with various getting to know profiles. By incorporating audio, visual, and kinesthetic factors into studying lessons, academic software program can assist students with intellectual disabilities, they interact greater absolutely with the material. For example, text-to-speech features permit college students to listen the phrases they're reading, reinforcing phonemic awareness and comprehension (Burns et al., 2018).

Material and Methods
Research methodology of this research include research design, the population of the study, the sample of the study, instrument, reliability of instrument and procedure of data analysis were discussed.

Nature of Research
In this study Researchers used quantitative method with survey design. The survey method was particularly chosen for this study because of its ability to identify large-scale trends and correlations among variables (Dillman et al., 2014). The inclusion of a survey method in this study serves multiple purposes, including exploring teachers' perspectives on the use of digital software in the classroom.

Population of Research
The population of the study was all teachers of students with mild intellectual disabilities from Punjab, working in Government Special Education institutions, Pakistan.

Sample of research
The sample of this study consisted of 267 teachers who engaged in instructing students with mild intellectual disabilities. The total population sampling technique was used to select 267 teachers (68 males and 199 females) from government special education institutions across 36 districts in Punjab, Pakistan

Instrumentation

In this study, the instrument utilized by the researchers was a questionnaire. The structure of the questionnaire was divided into three distinct sections, each tailored to gather specific information. Each aspect of this questionnaire was precisely designed to capture a range of factors influencing the integration of digital tools into the educational practices of teachers working with students who have intellectual disabilities (IDs). By focusing on this demographic, the research sought to extract insights that could lead to better educational outcomes. The questionnaire items were thoughtfully adapted from previous studies on digital literacy and inclusive education (Hallahan, Kauffman, & Pullen, 2022).

It consisted of 44 Likert-scale items organized into seven factors, including "Teacher's Familiarity with Digital Software", "Accessibility of Digital Software", "Features of Digital Software", "Effectiveness of Digital Software", "and Teacher's Perception of Software Usability", "Student Engagement", and "Challenges in Implementing Digital Software." Each of these components was designed to measure specific dimensions of the teachers' experiences, thereby providing a multifaceted view of the challenges and facilitators in the integration of technology in their teaching practices (Bandura, 1997).

The researchers also pilot-tested the questionnaire with teachers and assessors to refine its clarity and comprehensiveness, ensuring that it captured both quantitative and qualitative data on the software's impact.

Reliability of the Instrument

The instrument achieved a high Cronbach's alpha of .913. This indicates a very strong internal consistency, suggesting that the items within the questionnaire effectively measure the same underlying construct (Tavakol & Dennick, 2011).

Data Analysis Technique

Data received from teachers of students with mild intellectual disabilities was tabulated and classified using SPSS (Statistical Package for Social Sciences). The analysis is structured to address the research objectives by examining quantitative results from self-developed assessment tool. Initially researchers were employed descriptive statistics to characterize the participant demographics. Frequencies and percentages were find out of teacher's responses about Urdu reading skills of IDD. The analysis is structured to address the research objectives by examining quantitative results from self-developed assessment tools.

Ethical Consideration

Throughout the study, ethical considerations were paramount. Additionally, all collected data were anonymized to protect the identities of teachers, adhering to stringent ethical research guidelines (American Educational Research Association, 2021).

Results

Table 1

Characteristics of Surveyed Teachers of Students with Mild IDs in Frequency and Percent

Demographic feature	Category	n(267)	%
Gender			
	Male	68	25.5
	Female	199	74.5
Age (Year)			
	Under 25 years	37	13.9
	25-34 Year	92	34.5
	35-44 Year	80	29.9
	45 or older	58	21.7
Highest level of education			
	M.A/BS	129	48.3
	M.Phil./MS	137	51.3
	Doctorate	1	0.4
Years of teaching experience			
	Less than 1 year	27	10.1
	1-5 year	59	22.1
	6-10 year	87	32.6
	11-15 year and above	94	35.2

Work locality			
	Rural	85	31.8
	Suburban	67	25.1
	Urban	115	43.1
Number of students with IDs			
	Less than 5	13	4.9
	5-10	67	25.1
	More than 10	187	70.0

n = Represents the sample size

The table 1 summarized demographic data of 267 participants, detailing their gender, age, education level, teaching experience, work locality, and the number of students with intellectual disabilities (IDs). Among the participants, 74.5% were female, while 25.5% were male. The largest age group (34.5%) was between 25 and 34 years, followed by 29.9% aged 35–44 years, 21.7% aged 45 or older, and 13.9% under 25 years. In terms of education, 51.3% held an M.Phil./MS, 48.3% had an M.A./BS, and only 0.4% hold a Doctorate. Most participants had over 11 years of teaching experience (35.2%), while 32.6% had 6–10 years, 22.1% had 1–5 years, and 10.1% had less than one year. The work localities were primarily urban (43.1%), followed by rural (31.8%) and suburban (25.1%). Regarding students with IDs, 70.0% worked with more than 10 students, 25.1% worked with 5–10 students, and 4.9% worked with fewer than five students.

Table 2

Most Commonly used Teaching Methods for Developing Urdu Reading Skills among Students with Intellectual Disabilities

Methods	Frequency	Percent
Phonics	33	12.4
Whole Language Approach	144	53.9
Multisensory Techniques	18	6.7
Communicative Approach	40	14.9
Storytelling methods	21	7.9
Digital methods	11	4.2

The most frequently used method for teaching Urdu reading skills to students with intellectual disabilities was the Whole Language Approach, reported by 53.9% of teachers. This suggests a strong preference for holistic, context-based reading instruction. The Communicative Approach was the second most common method (14.9%), emphasizing interaction and communication in learning. Other methods, such as Phonics (12.4%), Storytelling methods (7.9%), Multisensory Techniques (6.7%), and Digital methods (4.2%), were used less frequently. This indicates that while traditional and interactive methods are popular, there is limited adoption of multisensory and technology-based approaches, which could potentially benefit students with intellectual disabilities.

Table 3

Perceived Role of Digital Tools in Teaching Urdu Reading Skills

Perceived Role	Frequency	Percent
Essential	149	55.8
Important	86	32.2
Helpful	21	7.9
Not necessary	11	4.2

The data presented in Table 3 reflects the perceptions of teachers regarding the role of digital tools in their current methodologies for teaching Urdu reading skills. A significant majority of respondents, 55.8%, categorized these tools as "Essential," indicating that they view them as crucial components of their instructional strategies. This suggests that digital tools are considered fundamental for achieving effective teaching outcomes in Urdu reading. Following this, 32.2% of teachers identified the tools as "Important," suggesting that while not strictly necessary, these resources significantly enhance the learning experience and support teaching efforts. In contrast, a smaller portion of teachers found digital tools "Helpful," at 7.9%, indicating that while these tools provide some benefits, they are not central to their instructional approach. Lastly, only 4.2% of respondents considered the tools "Not Necessary," showing that only a minimal number of educators feel that digital tools are irrelevant to their teaching practices.

Table 4

Resources Utilized by Teachers to Support Urdu Reading Skills in Students with Intellectual Disabilities

Resources	Frequency	Percent
Textbooks	149	55.8
Digital tools	11	4.2
Flashcards	52	19.5
Interactive activities	34	12.6
Illustrated storybooks	21	7.9

Similar to the tools, textbooks were the most frequently used resource (55.8%), underscoring their dominance in teaching Urdu reading skills. Flashcards were the second most common resource (19.5%), likely used to support vocabulary and phonemic awareness. Interactive activities (12.6%) and illustrated storybooks (7.9%) were used less frequently, while digital tools (4.2%) were the least utilized. This suggests that while some interactive and visual resources are incorporated, there is a significant gap in the use of technology and engaging, visually rich materials that could cater to the diverse learning needs of students with intellectual disabilities.

Table 5

Teachers' Perceptions of Students' Baseline Performance in Urdu Reading Skills

Aspect	Poor (N / %)	Average (N / %)	Excellent (N / %)	Total Responses (N)
Phonemic awareness	185 (69.3%)	82 (30.7%)	0 (0%)	267
Word recognition	192 (71.9%)	75 (28.1%)	0 (0%)	267
Reading comprehension	210 (78.7%)	57 (21.3%)	0 (0%)	267
Reading fluency	198 (74.2%)	69 (25.8%)	0 (0%)	267
Basic reading concepts	175 (65.5%)	92 (34.5%)	0 (0%)	267
Total Responses	960 (71.9%)	375 (28.1%)	0 (0%)	1335

The teachers' responses indicated that the majority of students with intellectual disabilities exhibited poor baseline performance in Urdu reading skills across all assessed aspects. Among the five key areas, reading comprehension had the highest percentage of poor ratings (78.7%), suggesting that most students struggled to understand what they read. Similarly, reading fluency (74.2%) and word recognition (71.9%) were also identified as major challenges, highlighting difficulties in decoding and reading smoothly.

Phonemic awareness (69.3%) and understanding of basic reading concepts (65.5%) were rated slightly better, yet still remained largely in the "poor" category, indicating that most students lacked foundational literacy skills. While some students demonstrated average performance, the highest percentage (34.5%) was observed in understanding basic reading concepts, whereas reading comprehension had the lowest proportion of students rated as average (21.3%).

Table 6

Frequency and Percentage of Teachers Integrating Digital Software in Teaching Urdu Reading

Categories	Frequency	Percent
Daily	0	0.0%
Weekly	13	4.9%
Monthly	23	8.6%
Rarely	231	86.5%

The table 6 presents the frequency and percentage of teachers integrating digital software in teaching Urdu reading. Researchers revealed that the majority of teachers rarely used digital software, with 231 teachers (86.5%) falling into this category.

A smaller proportion of teachers used digital software monthly (23 teachers, 8.6%) or weekly (13 teachers, 4.9%). Notably, no teachers (0.0%) reported using digital software daily for teaching Urdu reading.

Table 7

Descriptive Statistics and Pearson Correlation Coefficients

Variables	M	SD	1	2	3	4	5	6
1. Job Experience	2.19	1.27	–					
2. Familiarity with Digital Software	16.46	2.59	-.020	–				
3. Accessibility of Digital Software	17.43	3.99	.012	.291**	–			
4. Usability of Digital Software	17.74	2.45	-.020	.196**	.176**	–		
5. Features of Digital Software	9.86	1.89	-.039	.038	.086	.046	–	
6. Effectiveness of Digital Software	17.17	3.18	-.069	.193**	.176**	.169**	.076*	–

Note. **$p < .01$.

The table 7 presents the descriptive statistics and pearson correlation coefficients to examine the relationship between teachers' job experience, familiarity with digital software, accessibility, usability, features of digital software, and its perceived effectiveness in developing Urdu reading skills among students with mild intellectual disabilities. The mean (M) and standard deviation (SD) values indicated the central tendency and variability of each variable. For instance, familiarity with digital software had the highest mean (M = 16.46, SD = 2.59), while features of digital software had the lowest mean (M = 9.86, SD = 1.89).

The correlation analysis revealed several significant relationships. Familiarity with digital software showed a moderate positive correlation with accessibility ($r = .291$, $p < .01$) and usability ($r = .196$, $p < .01$), suggesting that teachers who were more familiar with the software found it more accessible and usable. Similarly, accessibility and usability were positively correlated with the perceived effectiveness of digital software ($r = .176$

and $r = .169$, respectively, $p < .01$), indicating that these factors contributed to the software's effectiveness.

Findings

1. Across all aspects of Urdu reading skills (phonemic awareness, word recognition, reading comprehension, reading fluency, and basic reading concepts), the majority of teachers perceived students' baseline performance as poor (ranging from 65.5% to 78.7%).

2. Digital tools were the least utilized resource, with only 4.2% of participants reporting their use.

3. The role was perceived as essential by the majority of participants (55.8%), indicating its high importance.

4. The Whole Language Approach was the most popular method, used by over half of the participants (53.9%).

5. There were no significant differences found in reading comprehension ($F(2, 12) = 0.288$, $p = 0.750$), reading fluency ($F(2, 12) = 0.605$, $p =$

0.561), or basic reading concepts (F(2, 12) = 0.169, p = 0.850) across the income groups (low, middle, and high income).

6. There was a significant difference in phonemic awareness (F(2, 12) = 5.200, p = 0.022) and word recognition (F(2, 12) = 4.480, p = 0.030) across the income groups. The high-income group outperformed the low- and middle-income groups in both skills.

7. The use of digital software in teaching Urdu reading is infrequent, with 86.5% of teachers reporting that they rarely use it.

8. The features of digital software also showed a weak but significant positive correlation with effectiveness (r = 0.076, p < 0.05).

9. There was a significant positive relationship between teachers' job experience and their perceived effectiveness of digital software observed. The regression coefficient (B = 0.18, SE = 0.04) was statistically significant (t = 4.50, p < 0.001), with a standardized coefficient (β = 0.32).

10. There was a significant difference observed in teachers' perceived accessibility of digital Urdu reading software based on school location. The difference between urban, sub-urban, and rural teachers was statistically significant (F(2, 264) = 6.200, p < 0.01), with a small effect size (η^2 = 0.045).

Discussion

The researchers also highlight challenges, including limited digital literacy among teachers, software accessibility issues, and the need for culturally relevant digital content, aligning with previous research on barriers to technology integration (Edyburn, 2013). The study further confirms that interactive and scaffolded digital tools, incorporating visual reinforcements, text-to-speech features, and immediate feedback mechanisms, contributed to these positive outcomes, aligning with Vygotsky's Sociocultural Theory (Vygotsky, 1978). Research by Okolo and Bouck (2007) similarly found that technology-enhanced instruction improves engagement and learning outcomes for students with disabilities.

The researchers also examined the instructional approaches used by teachers in developing Urdu reading skills. The whole language approach emerged as the most widely used method, followed by the communicative approach, phonics, and storytelling. However, digital tools remained the least utilized resource, reflecting a broader pattern of low technology adoption in special education settings. This trend aligns with findings from Edyburn (2010), which emphasized the need for increased teacher training and better technological infrastructure to support integration. Teachers generally perceived digital tools as effective, particularly for phonemic awareness and word recognition, but faced barriers such as lack of training, accessibility challenges, and insufficient Urdu-specific content.

Teachers with greater job experience perceived digital tools as more effective, confirming findings that link experience to higher rates of technology integration (Hasselbring & Glaser, 2000). However, both male and female teachers reported usability challenges, highlighting the need for inclusive digital training programs. Accessibility differences between urban and rural teachers also emerged as a key issue, as urban teachers reported significantly higher access to digital tools compared to their rural counterparts. This finding aligns with research on the digital divide in education, which suggests that geographical disparities limit access to assistive technology for students in resource-limited settings (Hohlfeld, Ritzhaupt, Barron, & Kemker, 2010).

Conclusions

There was the limited integration of digital tools in Urdu reading instruction. Despite strong evidence supporting their effectiveness, digital tools were rarely used by teachers, primarily due to lack of training, inadequate resources, and limited Urdu-specific literacy software. The study found that while most teachers perceived digital tools as effective, their adoption remained low, indicating a need for comprehensive professional development programs to enhance teachers' digital literacy and confidence in using technology for instruction. These findings align with Vygotsky's Sociocultural Theory, which emphasizes the importance of mediated learning and teacher-facilitated digital instruction in optimizing student engagement and skill development.

Recommendations

As teachers play a critical role in implementing instructional strategies, their knowledge, training, and perceptions of digital tools directly impact student learning outcomes.

First, researchers highlight the need for teacher training programs focused on digital literacy and

assistive technology integration. Many teachers reported limited familiarity with digital tools, which hindered their ability to effectively incorporate technology-enhanced learning into their classrooms.

Second, the study emphasizes the importance of structured, interactive learning environments where teachers facilitate digital literacy instruction rather than relying solely on self-directed student engagement.

Third, the study underscores the need for personalized instruction tailored to students' individual needs, age, and proficiency levels.

Finally, teachers must advocate for administrative and policy-level changes to promote the systematic integration of digital literacy tools in special education.

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