

Impact of Integration of Inclusive Education and Information and Communication Technology on the Learning Process of a Child with Down Syndrome

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ABSTRACT

Dawn Syndrome's life is being facilitated by Information and Communication Technology (ICT) & Assistive Technology (AT). Assistive technology allows people with Down syndrome to participate in daily activities and become more autonomous and social. India is making crucial contributions to improving the lives of people with Dawn Syndrome and promoting their participation in everyday social activities. However, the use of assistive technology to support these populations in these nations needs to be improved. The primary goal of the current study is to assess the situation with regard to the use of auxiliary aids in the teaching and learning of Down syndrome pupils in inclusion schools and rehabilitation facilities in India.

Furthermore, the effects of ICT & AT on improving the independence, performance, and social interaction of students with Down syndrome were investigated. To accomplish these goals, two distinct surveys were given to a non-random sample of teachers, experts, and Down syndrome families in India. Overall, the findings indicate that implementing ICT & AT in the instruction and learning of Down syndrome pupils can help them become more autonomous and sociable. In turn, this can promote independence, social interaction, and performance in people with Down syndrome. The ability and talents of the teachers, professionals, and families still need to be improved in order for them to accept the ICT & AT and achieve the best results in order to realize the greatest and most long-lasting benefits of adopting it. The study's findings include various suggestions for improving India's educational system for students with Down syndrome and other disabilities. The study also makes a significant contribution to theoretical literature and understanding by developing a novel model for analyzing the effects of ICT & AT on Down syndrome, a model that has not been frequently developed in earlier work. Additionally, it has created new metrics that can be used in similar future research.

Keywords: *Inclusive education, ICT, Assistive Technology, Down Syndrome child.*

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INTRODUCTION

Information and Communication Technology (ICT) and assistive technology (AT) are regarded as useful teaching tools that can help students with Dawn syndrome (DS) develop their social skills, academic accomplishment, and capacity to deal with life's rapid change (Ahmed, 2015; & Lahm, 2002). AT provides new opportunities for everyone, but for people with Down syndrome (DS), these opportunities are especially significant because they can use AT more extensively than other people do for their daily activities (Ahamed, 2015). That indicates that people with disabilities can now engage in all facets of social life on an even playing field. Without technology, DS would be unable to connect with people, participate in social activities, and be active members of their communities (Cowan & Khan, 2005).

Despite the critical attention paid to DS and other disabled individuals in India, information and communication technology (ICT) is still not being used to serve this population. There haven't been many studies done to examine how AT affects people with disabilities. Therefore, the primary goal of the current study is to respond to the question, "To what extent does ICT assist DS students in India to be independent and participate in normal life?"

The primary goal of the current study is to examine the current state of the adoption of ICT & AT in the educational process for students with disabilities in inclusive schools and rehabilitation facilities. The following issues will be addressed: the difficulties that DS students face due to their unique characteristics or disabilities, the extent to

which these challenges have an effect on their teaching and learning processes, and the types of ICT used by inclusion schools and rehabilitation facilities for these purposes. The project will also look at how ICT & AT might help DS students be more independent, perform better, and engage with others.

The current study is regarded as one of the few important ones in the area of ICT & AT and the education of people with exceptional needs. The study addresses the participation of DS students in a productive school environment and regular social life, a crucial issue for the Arab world. The study's social implications include raising awareness of people with special needs, including DS, and how they can participate actively in society. Indian policymakers and educators will give the impact of AT on assisting DS kids and raising their achievement more consideration.

MATERIALS AND METHODS

In order to clarify the effects of implementing ICT & AT to support the DS in the classroom and improve their performance, engagement, and interaction in the inclusion schools and rehabilitation facilities in India, a self-administrated questionnaire was adopted. All those who work with DS pupils, including teachers from inclusion schools, experts and specialists from rehabilitation institutions, and family members, were identified as the population of the current study. All of the specialists or experts from the rehabilitation centres listed in Table (1) were chosen. On the other hand, all instructors chosen to lead inclusion classes were drawn from the inclusion schools listed in Table (1).

Table – 1: List of schools and rehabilitation centres in India

Rehabilitation Centres	Respective School
Deepthi Center , Aruvithura , Kerala , India	Special School for MR, Aruvithura, Kerala, India
Hindu Seva Prathisthana Trust, Karnataka, Bangalore, India	School for Children with Special Needs, Bangalore, India
Chittaranjan Smriti Pratibandhi Seva Kendra , West Bengal , India	Special School for MR Children, West Bengal, India
Asansol Anandam , Asansol , West Bengal	St.Vincent School Campus, Asansol, West Bengal, India
Barjora Ashar Alo , Bankura, West Bengal , India	Special School for MR Children & Therapy Courses, Bankura, West Bengal, India
Eastern Comand of Army wives Welfare Association(Army Welfare Society), Kolkata, West Bengal, India	Asha School, Calcutta, Kolkata, India
Sevayatan Kalyan Kendra, West Bengal , India	Special School for Deaf, Dumb & MR, W.B, India
Anchal Charitable Trust, Delhi, India	Special School for MR, Delhi
Bharat Lok Hit Seva Samiti, Gujrat, India	Special School for MR, Gujrat
DOT Asha Centre(Army Welfare Society),Haryana , India	Asha School, Hissar, India
Digdarshika Institue of Rehabilitation Research, Bhopal, India	Special School for MR, Bhopal, India
Swami Vivekanand Dhyan Prasarak Mandal, Bori, Maharashtra, India	School for MR, Bori, Maharashtra, India

In addition, 300 families at random were chosen from a total of 956 families with DS. As a result, 680 teachers, professionals, specialists, and parents were included in the sample. Only 509 complete, accurate, and legible questionnaires were returned, with a response rate of 74.85% which is regarded as high, particularly among the families of the DS. 290 surveys for teachers and specialists and 245 for the families of DS students in India were returned.

The authors created the measurement scales because there were no known scales for measuring study model features like AT for supporting hearing impairment, AT for supporting motor, AT for supporting cognitive and mental impairment, and AT for supporting vision impairment. However, the measurement of communication was developed based on the measurement of Easlin and LaRose (2002) and Kaya and Weber (2003).

DATA ANALYSIS AND RESULTS

Demography

The demographics of the participants, including teachers, experts, specialists, and DS families, will be covered in the current section. Such details can offer justification and pointers regarding the study of the research model's outcomes. As per Table- 2 findings, special and general education teachers made up the majority of the participants (37.6 and 20.3%, respectively). However, just 18.6% of them are social workers and supervisors from rehabilitation institutes. Teachers that promote inclusion make up a small portion of the participants (9.2%).

Additionally, Table (2)'s findings indicate that the majority of participants are young males (40 or less, 75.8%), female (62.7%), and bachelor's degree-holding (68.6%), which accounts for their lack of experience (five or fewer years, 67.2%), PG holder is involved only 23.9 %.

Table – 2 Teachers' Demographic Information

Education Role	
Special Education Teacher	37.6 %
General Education Teacher	20.3 %
Social Worker	18.6 %
Inclusive Teacher	9.2 %
Gender	
Male	75.8 %
Female	62.8 %
Education Level	
Secondary	No data
Diploma	No data
Bachelor	68.6 %
PG	23.9 %
PhD	Data not conclusive

Table -3 provides demographic data on the DS students' families. According to the findings, the majority of the family members are young women. However, in the context of education, only 65.5% of them hold a diploma or higher, and they are less educated. Other details are presented in Table – 3. The information in the

next section provides details on the current state of ICT adoption in teaching DS in schools or rehabilitation facilities, including the benefits for skilled teachers, the different ICT used, challenges, and issues that families and teachers must deal with.

Table – 3 DS Child Families' Demographic Information

Gender		Education Level	
Female		Board or less than Board	64.8 %
Male		Secondary	63.9 %
Age		Diploma	65.5 %
20 – 30 Yr	43.6 %	Bachelor	58.7 %
31 – 40 Yr	29.23	Masters	29.6 %
41 – 60 Yr	29.5 %	PhD or more	2.9 %
60 Yr onwards	2.6 %		
Related to the Down Syndrome			
Mother			59.6 %
Father			46.8 %
Brother / Sister			53.6 %
Other			29.6 %

The results in Table 4 depict how many teachers or special teachers have done how many courses as well how much experience they have. Table-4 also provides information regarding training that the teacher or special teacher has done to trend the DS. This is

because the majority of the participants, including teachers, experts, and supervisors, were young. However, as indicated by the statistics, they had no prior experience utilizing.

Table – 4 Experience of teacher/specialist in using ICT & AT

Experience in Teaching DS students	%	No. of courses in which AT was adopted	%	No. of Workshop or training on ICT & AT	%
Less than one year	29.8 %	None	45.5 %	None	48.5 %
1 -5 Years	40.1 %	1 – 5 course	44.5 %	1 – 5 course	42.2 %
6 – 10 Years	19.6 %	6 –10 course	9.3 %	6 –10 course	11.6 %
More than 10 years	22.6 %	10 courses and onwards 10 courses	9.6 %	10 courses and onwards 10 courses	9.3 %

When the families were asked to specify the ideal method for instructing their DS students, they showed that inclusion in special schools or centres (25%) rather than inclusion schools

is the best method. They don't mind adopting the ICT, though, either in the special or inclusion classes (30% and 30%, respectively) Table – 5.

Table – 5 Data regarding the perception on the best way for teaching DS

Teaching DS in inclusive school	Teaching DS in Special school	Adopting ICT & AT to teach DS in an inclusive class	Adopting ICT & AT to teach DS in the special class
15 %	25 %	30 %	30 %

Table – 6 presents the findings on the various difficulties that DS students typically experience. According to the findings, DS

primarily experienced speech/language disorders (41%), and cognitive impairments (58%). Other data are encoded in Table – 6.

Table – 6 Type of disabilities that Ds are suffering from

Type of disabilities that Ds are suffering	Percentage
Cognitive disability	58 %
Communication impairment	41 %
Learning difficulties	18 %
Physical / Motor impairment	3 %
Vision impairment	5 %
Schizophrenia psychotic	3 %
Infantile Paralysis	2.5 %

Although ICT supports DS kids' learning and instruction in many ways, using such technology can provide a number of difficulties and impediments for both

instructors and families. In order to determine the biggest obstacles to using ICT, teachers and families were asked, and the results are provided in Table -7.

Table – 7 Barriers to adopting AT for supporting DS students

Barriers to adopting DS students by BY	Teacher, Experts, and Specialists	Family
Adopt the suitable ICT & AT	35.6 %	56.8 %
Difficult to encourage DS to adopt ICT & AT	24.6 %	3.8 %
Lack of sufficient skills and experience to adopt ICT & AT	49.3 %	39.4%
Adopt poor and cheap ICT & AT	12.3%	11.3 %
The complexity of ICT & AT	19.6 %	16.9 %
Availability of Lack of training provided on ICT & AT	52.6 %	42.9 %
Perceived benefit of ICT & AT	28.8 %	23.6 %
Lack of training provided on ICT & AT	56 %	68 %
High Cost of ICT & AT	68 %	70 %

DISCUSSION AND CONCLUSIONS

Due to the rising number of DS in India, it is important to take advantage of the opportunities presented by the quick development of innovative ICT and AT, which makes life easier for these groups of people, allows them to communicate and participate in society, and gives them the best learning environment. India is making significant efforts to support the development of individuals with special needs and DS and to include them more as contributing members of society, but they have not yet reached a stage where they are adopting AT in a mature manner in the teaching and learning processes of DS in inclusion schools or rehabilitation/special centres. It has been discovered that the main obstacles to the use of technology in educational institutions are a lack of ICT accessibility, a lack of resources, and a lack of expertise. This suggests that even if schools are set up to accommodate the educational requirements of children with DS, they could not be sufficiently furnished with cutting-edge technology to aid learning. The inclusion of DS and other students in India with minor special needs and disabilities into the regular educational process began only in 2001 as an ad hoc approach, but it advanced to a more structured and manageable process in 2011. As a result, inclusion schools still lack specialized teachers who can assist in instructing DS pupils.

Additionally, most of the teachers and professionals that are caring for DS pupils are female. Females are more suited to working with DS kids due to their inherent tenderness and passion. As a result, they can support, collaborate, and love DS pupils both within and outside of the classroom. Parents of DS students believe that modifying AT in inclusion schools rather than rehabilitation or special centres is the greatest option to enhance the learning quality of their DS students (Erdem, 2017). DS can succeed and progress if they attend class alongside other classmates. Teaching DS is difficult since it requires studying these individuals and figuring out their strengths, weaknesses, and issues to deal with them appropriately and choose the AT that best accommodates their disabilities.

Additionally, DS children face a variety of challenges due to either their nature and unique traits or the use of the AT in their teaching and learning processes. Many issues could arise for DS in the classroom or with his or her family at home. However, given that DS may be impacted by their environment, these issues could not be the same.

In light of this, the study's findings indicate that the main difficulties that teachers and other specialists encounter in the classroom are "lack of focusing and understanding," "difficulties in speech and language," and "communication with others,"

while at home, families experience issues with "receptive and expressive language," "reading and writing," and "lack of focus." The findings revealed that the main difficulties and barriers that teachers/specialists in adopting ICT are the "high cost of AT devices" and "adopting the suitable ICT" in a suitable situation. This is in reference to the problems that are facing teachers/specialists and families in adopting ICT in teaching DS.

The investigation of the current state of ICT adoption in teaching and learning for DS children in inclusion schools and rehabilitation facilities was the primary goal of the current study. In addition, the effects of ICT on improving DS kids' independence, performance, and social interaction were looked at. The results of the study show how important ICT is in helping DS learn and participate in society by improving their communication, performance, social interactions, and independence. The Indian government has increased its focus on the DS and created a long-term strategic strategy for creating a group of people who can function regularly in everyday life and live like everyone else.

They offer several inclusion programmes for people with disabilities and special needs. In 2001–2002, they began offering similar programmes in ten primary schools, and as of late, they have such programmes in 40 schools at various levels. Additionally, they offer a unique curriculum for the DS as well as unique tests. The MOE began by mainstreaming academic inclusion before moving on to social inclusion (normalization) (Alwasat, 2003). Additionally, a variety of ICT was offered to help with the motor, vision, and hearing impairments of DS, including buss with elevators to make it easier for DS to get around and support their motor, as well as placing their courses on the ground floor with specialized restrooms.

In addition, they offer pronto, CCTVE, digital amplifiers, and Dell touch computers. However, some professional certificates, like the one offered by the agriculture programme, help DS develop some

of their talents and better their social connection. Additionally, they are allocating particular scholarships to DS who have completed secondary education (Alayam, 2015).

Additionally, schools that successfully integrate students with DS must have strong leadership that can address each student's unique needs and a dedication to offering a wide variety of curricula to all students. (Krahn et al., 2015).

Overall, the primary conclusions of the model study were the necessity of improving the DS's communication. In many ways, DS people's improved communication abilities, especially those with speech and language impairments, can inspire them to compete with others by attending seminars that promote interaction with others (McCoy, 2013).

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