

Technology in Special Education: Integration of Assistive Technology and Educational Apps

Kakisu Yau Alhassan^{1*}, Dr. Shraddha Verma²

ABSTRACT

Now a days Technology is everywhere. For the children with special need to learn simple and easier manner It a clear and simple way through the use of assertive technology. The integration of assistive technology (AT) and learning apps in special education represents a transformative initiative aimed at improving the learning experiences and outcomes of individuals with diverse learning needs. This synergistic approach aims to harness the power of technological tools to create inclusive and personalized learning environments that meet the unique needs of students with disabilities. This paper provides an overview of the key aspects in integration of assistive technology and educational apps to teaching of teaching children with special needs, and highlights its potential benefits and challenges.

Keywords: *Technology, Special Education, Assistive Technology, Educational Apps*

Special Education

Special education is defined as education specifically geared to the special needs of a child with a disability. Special education refers to an educational system designed exclusively to meet the needs of students with disabilities or special needs. The goal of special education is to provide these students with an education tailored to their individual abilities and to ensure that they have equal access to educational opportunities. Aspects of special education include the following:

- **Inclusive approach:** In many education systems, there is an increasing emphasis on inclusive education, where students with special needs are taught alongside their non-disabled peers in mainstream classes. This promotes a sense of belonging and social interaction.
- **Individualized Education Program (IEP):** Each student with special educational needs typically has an Individualized Education Program (IEP) that outlines educational goals, services and accommodations for that student. The IEP is developed jointly by teachers, parents and, in some cases, the students themselves.
- **Diverse range of disabilities:** Special education addresses a variety of disabilities including, but not limited to, the following:
- **Learning disabilities:** Difficulty acquiring and applying academic skills, such as reading or math.

¹MA Education, 1st Semester, Kalinga University, Raipur, C.G, India

²Dean faculty of Education Kalinga University Raipur CG

*Corresponding Author

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Technology in Special Education: Integration of Assistive Technology and Educational Apps

- **Intellectual disabilities:** Significant limitations in intellectual abilities and adaptive behavior.
- **Emotional and behavioral disorders:** Difficulty coping with emotions or behaviors.
- **Speech and language disorders:** Difficulties with communication and language development.
- **Physical disabilities:** Challenges related to mobility or physical functions.

Specialized instruction: Special education teachers are trained to provide specialized instruction that addresses the unique needs of students with disabilities. This may include different teaching methods, materials or assistive technology. In addition to academic instruction, special education students may receive ancillary services such as speech therapy, occupational therapy, physical therapy, counseling or special transportation.

Collaboration: Special education requires collaboration between educators, parents, professionals and other support staff. Teamwork is important to ensure that each student's needs are fully addressed.

Transition planning: For students nearing the end of their formal education, the focus is often on transition planning. This includes preparing students for life after school, be it further education, employment or independent living.

Advocacy: Parents and guardians often play a crucial role in advocating for the needs of their children in special education. They work closely with educators to ensure that the educational experience is tailored to their child's strengths and challenges.

Legal framework: In many countries, there is a legal framework that protects the rights of students with disabilities and ensures that they receive appropriate educational services.

Continuous Assessment and Progress Monitoring: Regular assessment and progress monitoring are integral to special education. Educators use various assessment tools to understand a student's strengths and areas needing improvement, making adjustments to instruction as necessary.

Therefore, special education is a commitment to providing an equitable and inclusive education for all students, recognizing and addressing the diverse needs of individuals with disabilities. The field continues to evolve to ensure that students with special needs have the support and opportunities necessary to reach their full potential.

Technology in Special Education

Technology refers to the use of scientific knowledge, tools, techniques and systems to solve problems or achieve specific goals. It encompasses a wide range of applications and innovations that serve to enhance human capabilities, improve efficiency and overcome various challenges in different fields. Technology can be tangible, e.g. machines and devices, or intangible, e.g. software and processes.

Technological advances have added a new dimension to the teaching and learning process. The situation has changed from the old order of textbook consultation by teachers to sharing in the classroom. Through technology, both teachers and students can now interact with the

Technology in Special Education: Integration of Assistive Technology and Educational Apps

internet to update their knowledge on any subject in various disciplines. Technology in Special Education addresses the following topics:

- **Problem solving:** Technology is often developed to solve specific challenges or problems. Scientific principles are applied to create practical solutions that improve or simplify tasks and processes.
- **Innovation:** Technology is closely linked to innovation. It involves the development of new ideas, products or methods that lead to better results or greater efficiency.
- **Tools and equipment:** Traditional notions of technology often refer to physical tools and equipment. This includes machines, equipment and other artifacts designed to perform specific functions or tasks.
- **Information and communication technology (ICT):** In the modern age, technology is closely linked to information and communication. Computers, software, the internet and digital communication systems have become integral parts of technological advancement.
- **Automation:** Technology often involves the automation of tasks so that machines or systems can perform functions with minimal human intervention. This can lead to greater efficiency and accuracy.
- **Scientific knowledge and research:** The development of technology relies heavily on scientific knowledge and ongoing research. Scientific advances form the basis for technological innovation.
- **Adaptability and development:** Technology is dynamic and constantly evolving. Innovation builds on existing technologies and the field adapts to changing needs, leading to continuous improvement.
- **Social and cultural impacts:** Technology has profound social and cultural implications. It shapes the way people interact, communicate, work and live. It can also influence cultural practices, values and norms.
- **Ethical considerations:** As technology advances, ethical considerations become increasingly important. Issues relating to privacy, security, environmental impact and the well-being of society are crucial in the development and application of technology.
- **Global connectivity:** Technology has facilitated global networking, allowing information, ideas and resources to be shared across geographical boundaries. This interconnectedness has led to a globalized world.
- **Sustainability:** In recent years, increasing emphasis has been placed on developing technologies that are environmentally sustainable. This involves developing solutions that minimize the negative impact on the environment and promote long-term sustainability.
- **Education and skills development:** The rapid pace of technological change has implications for education and workforce development. Individuals need to acquire new skills to navigate and contribute to a technologically advanced society.

Therefore, technology in special education encompasses a wide range of tools, processes, and innovation that leverage scientific knowledge to improve human capabilities and address challenges across diverse domains. It is a dynamic and evolving field that shapes and is shaped by societal, cultural, and ethical considerations.

Assistive Technology (AT) in Special Education:

Technology is omnipresent these days. But did you know that there are special technical aids that can help people who learn and think differently? These aids, also known as assistive

Technology in Special Education: Integration of Assistive Technology and Educational Apps

technology or AT, are often inexpensive and easy to use. Assistive technology is any device, software or equipment that helps people overcome challenges so they can communicate and function better. A wheelchair is an example of an assistive device. So is software that reads text from a computer. Or a keyboard for someone who has problems with handwriting. These aids can help people to overcome their problems and at the same time make use of their strengths. This is especially important for children who have difficulty learning, whether it's reading, writing, math or any other subject. AT can help these children succeed in school and in life. And it can help boost their confidence and independence.

Assistive technology includes a wide range of devices, software and services designed to support people with disabilities in different areas of their lives, including education. Examples of assistive technology include speech-to-text conversion software, screen readers, adaptive keyboards, communication devices and specialist skills development software.

An assistive technology service is any direct assistance provided to the student with a disability in the selection, acquisition, or use of the assistive technology device. Assistive technology services include, but are not limited to:

- An assessment of a student's needs, including a functional assessment in the student's usual environment;
- The purchase, lease, or acquisition of an assistive technology device.
- The selection, design, customization, repair, and replacement of an assistive technology device; and
- The training or technical assistance of a student, the student's family, or other professionals who provide services to the student or are otherwise substantially involved in the student's major life functions.

Assistive technology consists of devices and services. An assistive technology device includes any item or piece of equipment that helps a person with a disability increase, maintain, or improve a student's functional capabilities. Assistive technology devices can be high-tech or low-tech. Examples of assistive technology devices are:

- Wheelchair or wheelchair ramp;
- Voice-activated computer;
- Telecommunication device;
- Electronic note takers and cassette recorders;
- An auditory FM trainer and closed-circuit TV;
- Large-print books;
- Word prediction, voice recognition and synthesis, and word processing software;
- Switches and controls for access to equipment;
- Tactile materials for visually impaired students, such as Braille flashcards, pegboards for teaching shapes or spatial relations, manual and electronic Braillewriters, and adaptive paper that provides extra visual or tactile feedback such as raised-line paper;
- Pencil grips;
- Hearing aids.

Assistive technologies used in classrooms

There is one of the main strategies schools use to assist with learning and thinking differences. Some adaptive tools are low-tech and some are pretty fancy, common examples includes the followings:

1. Audio Players and Recorders

It may help your child if they can hear the words as they read on the page. Many e-books contain audio files, and smartphones and tablet computers are equipped with text-to-speech software that can read everything on the screen to your child. If your child has difficulty writing or taking notes, they can use an audio recorder to record what the teacher says in class so that your child can listen to it again at home.

2. Timepiece

Whether it's a wristwatch or an hourglass, these inexpensive devices help children who have difficulty with pacing. Timers can be used as visual aids to show how much time is left for an activity. If your child has difficulty switching from one task to the next, timers can help them mentally prepare for the change.

3. Reading aids

Reading aids are a good tool for children who have trouble with visual tracking or who need help focusing on the page. The plastic strip highlights a line of text and hides surrounding words that could be distracting. The strip can also be easily moved around the page while reading.

4. Seat Cushions

An inflatable seat cushion can help children with sensory processing and attention problems. The cushion provides enough movement and stimulation to help the child maximize concentration without having to get up and walk around.

5. FM hearing systems

Frequency modulation (FM) systems can reduce background noise in the classroom and amplify what the teacher is saying. This can help with both auditory processing problems and attention problems. The teacher wears a microphone that transmits either to speakers in the room or to a personal receiver worn by the student. FM systems are also used to support children with hearing impairments, autism spectrum disorders and speech processing problems.

6. Calculator

Depending on your child's math problems, it may be appropriate for them to use a simple calculator in class. There are also calculators with large displays and even talking calculators. A talking calculator has a built-in voice output that reads the numbers, symbols and function keys out loud. This can help your child to confirm that they have pressed the correct keys.

7. Writing Supports

If your child has difficulty writing, try using plastic pens or a computer. Simple word processing programs have features that can help with spelling and grammar problems. For students whose thoughts run faster than they can write them down, different types of software can help. With word prediction software, your child types in the first few letters and the software then gives a selection of words that start with that letter. Speech recognition software allows your child to speak and have the text appear on the screen. This type of software is built into many smartphones and tablet computers.

8. Graphic organizers

Graphic organizers can be very simple. There are many different designs that you can print out to help your child organize their thoughts for a writing task. There are also more

Technology in Special Education: Integration of Assistive Technology and Educational Apps

sophisticated tools, such as organizational programs, that can help him organize his thoughts. Talk to your child's school to find the right assistive technology for your child.

Soft technologies- Examples of

Examples of Assistive Technology in the Classroom

1. Electronic Worksheets. Students with learning disabilities like dyslexia can use electronic worksheets to complete their assignments. ...
2. Phonetic Spelling Software. For many children with learning disabilities, reading and writing can be a challenge.
3. Talking Calculators.
4. Variable Speed Recorders.
5. Videotaped Social Skills.

Assistive Technology (AT) in Special Education

1. Text-to-Speech (TTS) and Speech-to-Text (STT) Software:

- **Purpose:** Helps students with reading difficulties or learning disabilities by converting written text into spoken words or vice versa.
- Examples: Kurzweil 3000, Natural Reader, Dragon NaturallySpeaking.

2. Screen Readers:

- **Purpose:** Supports visually impaired students by audibly reading the content displayed on the screen.
- Examples: JAWS (Job Access with Speech), NVDA (Nonvisual Desktop Access), Voice Over.

3. Augmentative and Alternative Communication (AAC) Devices:

- **Purpose:** Aids non-verbal individuals in communication using symbols, pictures, or synthesized speech.
- Examples: Proloquo2Go, Touch Chat, Tobii Dynavox.

4. Word Prediction Software:

- **Purpose:** Assists students with spelling and word formation by predicting and suggesting words as they type.
- Examples: Co: Writer, Word Q, Ginger.

5. Alternative Keyboards and Input Devices

- **Purpose:** Designed for students with physical disabilities who may find it challenging to use standard keyboards.
- Examples: BigKeys Keyboard, IntelliKeys, Adaptive Switches.

6. Electronic Math Worksheets

- **Purpose:** Supports students with learning disabilities in math by providing interactive and customizable math worksheets.
- Examples: ModMath, MathTalk, EquatIO.

7. Note-Taking Apps

- **Purpose:** Facilitates note-taking for students with organizational difficulties, allowing them to organize, review, and share notes.
- Examples: OneNote, Evernote, Notability.

8. Graphic Organizers and Mind Mapping Tools

- **Purpose:** Helps students with organization and planning, fostering visual representation of ideas.
- Examples: Inspiration, Mind Meister, XMind.

9. Screen Magnification Software

- **Purpose:** Enlarges on-screen content to assist visually impaired students in reading and viewing materials.

Technology in Special Education: Integration of Assistive Technology and Educational Apps

- Examples: Zoom Text, MAGic, Super Nova.

Educational Apps for Special Education:

1. Communication Apps:

- **Purpose:** Supports communication and language development for students with speech and language disorders.
- Examples: Proloquo2Go, Avaz, Touch Chat.

2. Interactive Learning Games:

- **Purpose:** Engages students in learning through interactive and educational games.
- Examples: Star fall, ABC mouse, Brain POP.

3. Adaptive Learning Apps:

- **Purpose:** Provides personalized learning experiences, adjusting content based on individual student progress.
- Examples: Dream Box, Khan Academy Kids, Smartick.

4. Reading Apps:

- **Purpose:** Enhances reading skills through interactive stories, phonics exercises, and comprehension activities.
- Examples: Epic! Reading Eggs, Raz-Kids.

5. Math Apps:

- **Purpose:** Supports math learning through interactive and adaptive math exercises.
- Examples: Dragon Box, Splash Learn, Prodigy.

6. Social Skills Apps:

- **Purpose:** Supports the development of social skills through interactive scenarios and activities.
- Examples: Social Express, Model Me Kids, Social Stories.

7. Executive Functioning Apps:

- **Purpose:** Assists with planning, organization, time management, and other executive function skills.
- Examples: Todoist, Trello, Focus@Will.

8. Behavior Management Apps:

- **Purpose:** Supports teachers and parents in tracking and managing behavior through positive reinforcement.
- Examples: Class Dojo, PBIS Rewards, 1, 2, 3 Magic.

Educational Approaches in Special Education

- **Inclusive education:** The move towards inclusive education aims to provide access to the general curriculum for all students, including those with disabilities. Adapting teaching methods, content and assessments to the different learning needs of students.

Integration of AT and pedagogical approaches

- **Personalization:** AT allows for the customization of learning experiences based on individual strengths and challenges, promoting a more student-centered approach.
- **Accessibility:** Integration ensures that instructional materials and activities are accessible to students with different abilities, promoting an inclusive learning environment.
- **Universal Design for Learning (UDL):** Combining UDL principles with AT creates flexible learning environments that cater to diverse learners.

Benefits of Integration

- **Improved Engagement:** AT increases engagement by providing interactive and dynamic learning experiences that cater to different learning styles.
- **Enhanced Independence:** AT empowers students by providing tools that enable them to complete educational tasks independently.
- **Data-Driven Decision Making:** Educational technologies generate valuable data that can support instructional strategies and interventions for better outcomes.

Challenges and considerations

1. **Accessibility gaps:** ensuring AT solutions are widely accessible and affordable for all students can be a challenge.
2. **Professional development:** Educators may need training to effectively integrate AT into their teaching practices.
3. **Technological obsolescence:** The rapid evolution of technology may pose a challenge when it comes to keeping AT tools up to date.

Future directions

- **Continued research:** Ongoing research is important to identify new technologies and effective strategies for integrating AT into special education.
- **Collaboration:** Stakeholders, including educators, researchers, developers and policy makers, need to work together to overcome challenges and promote the widespread adoption of integrated approaches.

In summary, the integration of assistive technology and educational approaches in special education holds great promise for fostering inclusive, personalized, and effective learning environments. Through continued collaboration and research, educators can harness the potential of technology to support students with diverse learning needs and promote their academic success. By integrating assistive technology and educational apps, a comprehensive support system can be created for students with special needs that addresses their various challenges and enhances their learning experience. It's important to consider individual needs and preferences when selecting and implementing these tools. Regular evaluation and feedback from students, teachers and parents can help refine the use of technology to achieve optimal impact.

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Technology in Special Education: Integration of Assistive Technology and Educational Apps

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Journal of Special Education Technology (JSET): JSET is a peer-reviewed journal that publishes research on the use of technology in special education. Access the journal at <https://journals.sagepub.com/home/jset>.

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Conflict of Interest

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