

Effectiveness of Computer Assisted Instruction on the Development of Social Skills among Children in Study

¹Arti Singh, ²Dinesh Pandey

¹Scholar, Subject Education Institute of Education and Research Faculty of Humanities Mangalayatan University, Beswan, Aligarh

²Supervisor Prof., Subject Education Institute of Education and Research Faculty of Humanities Mangalayatan University, Beswan, Aligarh

Abstract: Computer-Assisted Instruction (CAI) has emerged as an important development in the use of technology for educational purposes. The concept of using machines for teaching began in the early twentieth century. Sidney Pressey introduced one of the first teaching machines during the 1920s, which was mainly designed to conduct tests and provide immediate responses to learners. Later, in the 1950s, Norman Crowder developed a more advanced instructional system for military training that used branching techniques, allowing learners to move through content according to their responses. This approach was more flexible than earlier linear teaching methods. In 1954, B.F. Skinner further strengthened the theoretical foundation of CAI through the concept of programmed instruction based on behaviorist principles. Skinner emphasized learning through stimulus-response connections supported by reinforcement. His instructional model focused on presenting small units of information, encouraging learner responses, and providing immediate feedback. These early contributions became the basis for modern computer-assisted learning systems, which today include highly interactive and learner-centered instructional environments designed to meet the diverse educational needs of students, including children with intellectual disabilities. At present, different terms such as Computer-Assisted Instruction (CAI), Computer-Based Instruction (CBI), Computer-Based Education (CBE), and Computer-Assisted Learning (CAL) are used in educational literature. Although these terms are closely related, they differ slightly in meaning. CBI and CBE generally refer to broad computer-based educational practices, whereas CAI and CAL specifically focus on interactive teaching-learning activities such as tutorials, educational games, simulations, and practice exercises.

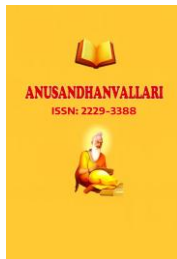
Key Word. CAI. CBE. CBI. UDL. UDL

Introduction.

Computer-Assisted Instruction is learner-centered in nature because it allows students to learn according to their own speed, capability, and learning requirements. This feature is especially beneficial for children with intellectual disabilities, who often need repeated practice, reinforcement, and individualized instruction for effective learning.

These programs provide repeated exercises on previously learned content to strengthen understanding and improve retention. Frequent repetition helps learners gain mastery and fluency in specific skills. Simulation-based programs create real-life situations within a digital environment. Learners participate actively in solving problems and making decisions. For children with intellectual disabilities, simulations using familiar objects and situations can support practical understanding and daily living skills.

Tutorial programs present instructional content step by step. They explain concepts, provide examples, and assess understanding through questions and feedback. Tutorials encourage independent learning and maintain learner interest through multimedia support. Demonstration programs use visuals, animations, videos, and



graphics to explain concepts and procedures. These presentations simplify complex ideas and prepare learners for practical application of skills.

These different forms of CAI can be modified according to the abilities, needs, and educational goals of learners with intellectual disabilities.

Educational Benefits of CAI for Children with Intellectual Disabilities

Computer-Assisted Instruction offers several educational advantages for children with intellectual disabilities. One major benefit is individualized learning. Students can work at their own pace and repeat activities as many times as needed without pressure or embarrassment.

Another important feature of CAI is immediate feedback. Learners receive instant responses to their answers, which helps them identify mistakes and strengthen correct responses. This continuous reinforcement supports better learning outcomes.

CAI programs usually organize instructional material into small and manageable steps, making learning easier and less overwhelming. Interactive features such as sounds, animations, games, and rewards also increase learner motivation and attention.

Additionally, CAI promotes active participation and independent learning. Learners can revisit lessons whenever required, helping improve retention and generalization of skills. Some programs are specifically designed to teach social behaviors such as greetings, sharing, turn-taking, and communication skills. Group-based computer activities may also encourage peer interaction and cooperative learning.

For teachers, CAI serves as an effective instructional and management tool. It helps educators prepare lesson plans, create teaching materials, develop assessments, and organize instructional activities more efficiently.

Computer-based systems also support record maintenance and progress monitoring, enabling teachers to track learner performance and provide individualized instruction. Through CAI, teachers can address the varied learning needs of students within inclusive and special education classrooms.

The integration of technology into teaching practices encourages innovative instruction and evidence-based decision-making. Students often show greater interest and engagement when teachers use technological tools effectively in classroom teaching. Computers provide a supportive and motivating learning environment for children who experience difficulties in traditional classroom settings. For learners with intellectual disabilities, CAI can reduce barriers related to communication, memory, attention, and motor coordination.

Various digital tools such as educational games, text-to-speech software, visual organizers, and interactive learning applications help learners understand concepts through multiple sensory channels. Such multisensory learning experiences improve participation and comprehension.

Structured digital instruction also helps learners who struggle with sequencing, organization, and task completion by presenting information in a clear and systematic manner.

Although CAI provides individualized instruction, the teacher continues to play a central role in the learning process. Teachers are responsible for selecting appropriate software, assessing student needs, and adapting instructional content according to learner abilities.

Teachers also guide students during computer-based activities, monitor their progress, and help them apply learned skills in real-life situations. In many cases, educators participate in designing or modifying digital instructional materials to make them suitable and meaningful for their students.

Therefore, successful implementation of CAI depends on the effective collaboration between technology and the teacher's professional expertise.

Providing equal access to technological resources for children with special needs requires proper planning, infrastructure, and support systems. Schools should ensure the availability of suitable hardware, assistive devices, and adaptive educational software to meet diverse learner needs.

The principles of Universal Design for Learning (UDL) should guide the development and selection of instructional materials so that all learners can access and benefit from technology-based education.

Research studies have consistently shown the positive impact of CAI on students with intellectual and developmental disabilities. Studies conducted by researchers such as Roble, Casteine, and King (1988) demonstrated improvements in instructional quality through computer use, while Sartorio (1993) reported enhanced language development among preschool children in special education settings.

These findings highlight the importance of CAI in improving educational opportunities, promoting independence, and supporting the inclusion of children with special needs in meaningful learning experiences.

Significance of the Study

In the present era, information and communication technology (ICT) has become an important part of education and daily life. Therefore, it is essential that children with special educational needs, especially those with intellectual disabilities, are provided equal opportunities to benefit from technological advancements in education. Inclusive education emphasizes equal access to learning resources, teaching methods, and educational opportunities for all learners, including those with disabilities.

With the increasing use of computers and digital tools in schools, special educators need to develop the skills required to use and create technology-based instructional materials. It is not sufficient to depend only on commercially available software; teachers should also be able to prepare instructional programs that are suitable for the individual learning needs, abilities, and developmental levels of children with intellectual disabilities.

The present study highlights the importance of developing a customized Computer-Assisted Instruction (CAI) package using simple and affordable software such as Microsoft PowerPoint. Such software allows the integration of pictures, text, sound, animations, and other multimedia elements to create attractive and interactive learning experiences. Multimedia presentation supports multisensory learning, which helps children with mild intellectual disability improve their attention, participation, understanding, and retention of concepts.

Through CAI, learners actively participate in the learning process by using devices such as keyboards and mice to interact with instructional materials. This interaction not only improves learning but also supports the development of psychomotor skills and independent exploration. Children with intellectual disabilities often respond positively to visual and auditory reinforcement, and the repetitive nature of CAI combined with immediate feedback helps strengthen learning and skill acquisition.

Another important aspect of CAI is its contribution to the development of confidence, self-esteem, and self-reliance among learners. When children are able to learn independently with reduced adult assistance, they develop a sense of achievement and motivation. This can positively influence their willingness to participate in educational and social activities.

The CAI package developed in this study also serves as a practical model for integrating technology into special education. Unlike many commercial software programs that may be costly and unsuitable for specific learner needs, the proposed instructional package is economical, adaptable, and easy to prepare by teachers with basic computer knowledge. This makes the program sustainable and easily replicable in different educational settings.

The usefulness of this study is not limited to special schools alone. The findings may benefit special educators, teacher educators, trainee teachers, parents, caregivers, and general classroom teachers who are involved in the education and support of children with intellectual disabilities. Once proven effective, the CAI package can be used in special schools, inclusive classrooms, resource rooms, and even home-based teaching programs.

Thus, the present study attempts to address an important educational need by combining technology with inclusive teaching practices. It provides a practical and research-based approach for improving the social skills and learning experiences of children with intellectual disabilities. The study also encourages educators to use simple and effective digital tools to promote quality, accessibility, and equality in education for children with special needs.

Social skills are essential for successful adjustment in family, school, and community environments. These skills help children communicate effectively, develop friendships, participate in group activities, and follow socially acceptable behaviors. Children with mild intellectual disability often experience difficulties in social interaction, communication, and understanding social situations, which may affect their adjustment and participation in daily life.

Traditionally, social skills are taught through direct classroom instruction, role play, group activities, and face-to-face interaction under the guidance of teachers. Although these methods are useful, children with intellectual disabilities often require repeated practice, immediate feedback, and individualized instruction to achieve meaningful learning outcomes.

Computer Assisted Instruction (CAI) provides an alternative and innovative approach for teaching social skills. Through the use of interactive activities, audio-visual materials, animations, and structured learning experiences, CAI creates an engaging and learner-friendly environment. It also allows children to learn at their own pace and receive instant feedback on their responses.

Therefore, the present study seeks to examine whether Computer Assisted Instruction can effectively improve the social skills of children with mild intellectual disability at the primary level. The study focuses on evaluating improvements in communication, cooperation, participation in social situations, understanding of social norms, and interaction with peers and others in everyday settings.

Operational Definitions of Terms

Computer Assisted Instruction (CAI)

Computer Assisted Instruction refers to the use of computer-based educational programs for teaching and learning purposes. In the present study, CAI involves the use of multimedia instructional materials prepared through Microsoft PowerPoint to develop social skills among children with mild intellectual disability. The instructional package includes pictures, sound, animations, and interactive activities that help children learn social behaviors such as greeting others, sharing, cooperating, initiating conversation, and responding appropriately in social situations. The program provides step-by-step guidance along with immediate feedback to reinforce correct responses.

Conventional Method

Conventional method refers to the traditional mode of teaching social skills through direct classroom interaction between teacher and students. In this method, the special educator teaches social behaviors using verbal instruction, demonstrations, role play, group activities, and peer interaction. Feedback and reinforcement are provided directly by the teacher during face-to-face learning activities.

Development

Development in the present study refers to the improvement and progress in social skills shown by children over a period of instruction. It includes the acquisition, practice, and effective use of social behaviors in different situations. Social skill development is measured through the child's ability to communicate appropriately, participate in group activities, follow social rules, express feelings properly, and interact positively with others.

Children with Mild Intellectual Disability

Children with mild intellectual disability refer to children whose intelligence quotient (IQ) generally ranges between 50 and 70 according to standardized intelligence assessments. These children experience limitations in intellectual functioning and adaptive behavior, particularly in areas such as communication, learning, reasoning, and social adjustment. They usually require structured instruction, repetition, and supportive teaching methods for effective learning and skill development.

Primary Level Children

Primary level children refer to children between the age group of 7 to 10 years who are studying in the primary classes of special schools or inclusive educational settings. At this stage, the development of communication and social interaction skills is considered highly important for overall adjustment and learning.

Social Skills

Social skills refer to the abilities that help an individual interact effectively and appropriately with others in different social situations. These skills include verbal and non-verbal communication, cooperation, sharing, empathy, turn-taking, understanding social cues, following social rules, and maintaining interpersonal relationships. In the present study, social skills include:

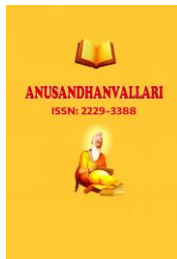
1. Greeting others
2. Making eye contact during interaction
3. Using polite word "Thank You"
4. Expressing needs
5. Identifying Emotion: Happy
6. Taking permission
7. Taking turn in play
8. Participation in group activity
9. Participation in social functions

Objectives of the Study:

- To assess the development of social skills in children having mild intellectual disability belonging to experimental group and control group before intervention.
- To assess the development of social skills in children having mild intellectual disability who will be taught through Computer Assisted Instruction.

Hypotheses

- There will be no significant difference between the pre-test and post-test scores of social skills among children with mild intellectual disability taught through Computer Assisted Instruction.
- There will be no significant difference between the pre-test and post-test scores of social skills among children with mild intellectual disability taught through the conventional method.



Variables

Variables are the fundamental elements of any research study. They represent the characteristics or factors that can differ from one individual, group, or situation to another. Researchers identify and study variables to understand patterns, relationships, and changes that occur within a particular phenomenon.

Characteristics of Variables

The important characteristics of variables are:

- A variable possesses the ability to vary across individuals or situations.
- It can be observed, measured, or manipulated according to the purpose of the study.
- It must be clearly defined to avoid ambiguity in interpretation.
- A variable should be directly related to the objectives of the investigation.
- It should allow the collection of meaningful and analyzable data.
- The measurement of a variable should be consistent and accurate.

Importance of Variables in Research Paper

Variables form the basis of the research process and guide the entire investigation. Their importance lies in the following aspects:

- They help in defining the focus and direction of the study.
- They provide a foundation for developing research questions and hypotheses.
- Variables make it possible to collect, classify, and analyze data systematically.
- They assist in determining the effect of one factor on another.
- They facilitate the interpretation of findings and the drawing of conclusions.
- Variables contribute to the scientific and objective nature of research.

Therefore, the proper identification and description of variables are essential for ensuring the validity, reliability, and overall quality of a research study.

Independent Variable

The independent variable is the factor that is deliberately introduced or controlled by the researcher in order to study its effect on another variable. It is considered the cause or influencing factor in an experimental study.

Independent Variable: Computer Assisted Instruction (CAI)

Dependent Variable

The dependent variable is the outcome or result that is observed and measured in the study. It changes according to the effect of the independent variable.

Dependent Variable: Social Skills

Delimitations of the Study

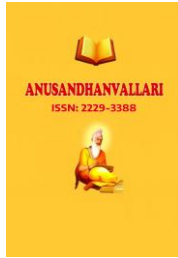
- The study is limited to selected special schools located in Dausa, Rajasthan .
- Only children with mild intellectual disability are included as participants in the present investigation.
- The study is confined to children between 7 to 10 years of age studying at the primary level in special education settings.

- The investigation focuses only on the development of social skills among children with mild intellectual disability.

Conclusion. The social skills selected for the present study are based on the daily functional needs of children with mild intellectual disability. These skills are essential for developing positive relationships, participating in classroom and community activities, and achieving social adjustment. The selected skills include greeting others, initiating and maintaining conversations, sharing, turn-taking, cooperation, understanding social cues, and following social norms. Children with intellectual disabilities often face challenges in these areas, which may lead to social isolation and difficulty in peer interaction. Therefore, systematic teaching of these skills is necessary for promoting social inclusion and improving quality of life. The present study uses Computer Assisted Instruction as a medium for teaching these social skills in an engaging and structured manner. Through repeated practice, visual support, and immediate reinforcement, the study aims to provide children with meaningful learning experiences that can improve their social competence and help them function more effectively in society.

References:

- [1] Ahmed, A. A. (2015). The Effectiveness of Using Computer-Assisted Instruction for Reading Intervention on Reading Comprehension and On-task Behaviour of Students with Attention Deficit Hyperactivity Disorders in a Second Language Classroom. (Doctoral Dissertation). Ohio University.
- [2] Anderson, m. B. (2003). Features of Plato, a computer-assisted instruction learning system, that promote students' mathematics achievement: a literature review. (Master's Thesis). North Carolina State University.
- [3] Anto, Asha Rani (2015). An application of computer assisted language learning in English subject of international baccalaureate of standard VIII of English medium schools. PhD thesis. Gujrat University.
- [4] Ashwal, Thukral S. (2001). A comparative study of the effectiveness of computer assisted instruction CAI and computer managed instruction CMI on pupil's achievement in science their self-concept and study involvement. P. HD Thesis. Maharshi Dayanand University.
- [5] Bhagirath, M. (2017). Effectiveness of multimedia package in teaching of English grammar at undergraduate level. P. HD Thesis. Saurashtra University.
- [6] Bostian, A. (2011). Effects of Computer Assisted Intervention in Second Graders with Attention and Literacy Problems. (Thesis). East Carolina University.
- [7] Chachane, H. (2025). Corruption, Institutions, and Development: A Political Economy Perspective, ShodhSamajik: Journal of Social Studies, 2(2), 84–88. <https://shodhsamajik.com/shodhsamajik/article/view/44>
- [8] Channabasappa, Doddamani G. (2011). Effectiveness of computer multimedia interactive strategy on achievement in geography of secondary school students. P. HD Thesis. Karnatak University.
- [9] S. Gajula, "AI-Powered Forecasting Models, Optimizing Working Capital, Supply Chain Financing," 2025 IEEE 1st International Conference on Recent Trends in Computing and Smart Mobility (RCSM), Bhopal, India, 2025, pp. 1-6, doi: 10.1109/RCSM67767.2025.11507813.
- [10] Devi, Sharmila (2013). Diagnosis of difficulties in Mathematics of VII class Students of Haryana and their Remediation through CAI Computer Assisted Instruction. P. HD Thesis. Maharshi Dayanand University.
- [11] Sunkara, S. P. (2025). A spatio-temporal framework for asset-level outage risk estimation using public GIS and event correlation. International Journal of Computer Engineering and Technology, 16(1), 4211–4227. https://doi.org/10.34218/IJCET_16_01_286.
- [12] Hazeena, V. (1995). Comparison of modular approach and traditional text book approach in teaching Physics. Unpublished M.Ed. thesis, Mahatma Gandhi University, Kottayam.



-
- [13] Nagwanshee, R. and Kumar, A. (2025). Traditional Economic Practices of Birhor Tribe of Chhattisgarh and its Relevance for Sustainable Development, *ShodhSamajik: Journal of Social Studies*, 2(2), 1–11. <https://doi.org/10.29121/ShodhSamajik.v2.i2.2025.22>
- [14] Singh, R.K. (2024). The Role of the Teacher in Developing Communication Skills and Self-Confidence in Students, *ShodhSamajik: Journal of Social Studies*, 1(1), 104–109. <https://doi.org/10.29121/ShodhSamajik.v1.i1.2024.97>