

Helping Overcome Learning Disabilities

What do Tom Cruise, Whoopi Goldberg, Walt Disney, Winston Churchill, and Alexander Graham Bell have in common?

Learning disability.

What Is Learning Disability

Learning disability is a life-long disorder that affects the manner in which individuals with average or above average intelligence select, retain, and express information. It reflects a difficulty in encoding and decoding information as it travels between the senses and the brain. Learning disabilities are also termed as 'learning differences,' based on the fact that certain individuals learn differently—they aren't unable to learn, but respond best to ways of learning that are different from traditional teaching methods. Learning disabilities vary in the level of severity and invariably interfere with the acquisition or use of one or more of the following important skills:

- **Oral language**
 - Listening
 - Speaking
 - Understanding
- **Reading**
 - Decoding
 - Comprehension
- **Written language**
 - Spelling
 - Written expression
- **Mathematics**
 - Computation
 - Problem solving

Types of Learning Disabilities

Learning disabilities fall into two major categories:

1. **Developmental speech and language disorders**
 - Articulation Disorder (difficulty in producing speech sounds)
 - Expressive Language Disorder (difficulty in communicating with spoken language)
 - Receptive Language Disorder (difficulty in understanding what other people say)
2. **Academic skills disorders**
 - Dyslexia—reading ability disorder (difficulty in understanding the written word)

- Dysgraphia—writing ability disorder (difficulty in forming written letters)
- Dyscalculia—computing ability disorder (difficulty in understanding Math)

Apart from these, there are certain disorders that affect the ability to learn but do not meet the criteria for a specific learning disability:

- **Motor Skills Disorders and Specific Developmental Disorders**
Lead to delays in acquiring language, academic, and motor skills
- **Coordination disorders**
Cause poor handwriting as well as certain spelling and memory disorders.
- **Attention Deficit Hyperactivity Disorder (ADHD)**
Caused by a biochemical problem, where the structure and/or function of the brain has been affected by some type of trauma. The learning process is therefore hindered due to inattention, impulsiveness, or activity level of the learner suffering from this.

Causes of Learning Disabilities

Learning disabilities are caused by abnormal brain structure and function. Different abnormalities cause different types of learning disabilities. These neurological abnormalities can result from a variety of sources:

- Genetics—abnormal brain structure and function can be inherited.
- Factors during pregnancy that impact brain development—drugs, alcohol, smoking, German measles, poor nutrition, or maternal stress.
- Factors during birth—premature delivery, low birth weight, or oxygen deprivation.
- Factors in early childhood—neonatal seizures, developmental or relational trauma, parental stress, poor nutrition, adequate learning environment, or toxins such as cadmium, lead, or chemotherapy.
- Brain trauma or tumors.

Effects of Learning Disabilities

Learning disabilities can affect individuals and others around them in many different ways throughout life:

- Students with learning disabilities often have to deal with failure, misunderstanding from teachers resulting in humiliation in the classroom and ridicule from other students, and low self esteem.
- Parents of such children often become stressed, and siblings may grow resentful or jealous of attention given to the learning disabled child.
- In the workplace, the individual may experience misunderstanding, ridicule, and self-esteem problems, while supervisors and peers may also suffer from stress and resentment in dealing with the person's learning disabilities.

Treatment of Learning Disabilities

A wide variety of programs have been developed to help kids with learning disabilities learn better. Teachers are specially trained to help learners with new ways to deal with the problem. Accommodation at school, work, and home settings can also be made to help the individual with a learning disability to achieve more success. Some of these may include:

- Classroom adjustments
Preferential seating, alternative assignments, or different approaches to teaching
- Specialized equipment
Word processors, voice synthesis and voice recognition programs, portable tape recorders, talking calculators, electronic spellers and dictionaries, and audio textbooks
- Classroom assistants
Tutors, note takers, readers, proofreaders, and transcribers
- Special education classes

Our Approach

Although several products are available for the identification and remediation of learning disabilities, most of these are either unable to sustain the progress of a disabled child or not aligned to government standards. To overcome this limitation, Tata Interactive Systems (TIS) develops end-to-end solutions that screen and identify children with learning disabilities, and offer remedial action as well as a tracking system to monitor their progress. TIS also administers tests that measure the child's progress and has created a system that tracks the child's development and improvement. The solution also allows teachers to view integrated class reports to view relative progress, requiring the involvement of the Education Board, special educators, teachers, and children.

Solution Components

Pre-Assessment

This step tests the children enrolling into various grades in a school. This helps separate the regular performers from the children who have special needs. At this point, the attempt is not to decipher the extent and the nature of the special needs but just to identify the children lagging behind.

This test can be made fully online with questions drafted in such a manner that facilitates identification. TIS uses Subject Matter Experts (SMEs) to formalize the questions keeping in mind the Grades to which the children belong and the corresponding state standards.

Screening

Here, the children who are identified as lagging behind through the pre-assessment need to undertake a series of Screening Tests. They aim to analyze the type and extent of every child's learning disability, based on a combination of online and offline tasks. The online component of the screening comprises objective questions such as Math, identifying objects, or listening to conversations, and answering questions based on the same.

This process also includes an element of subjective evaluation on the part of the special educator who would administer the test. There are also a series of physical tasks (administered offline) such as placing blocks in slots, which the child is expected to accomplish.

TIS has, in the past, created screening solutions such as Dyscalculia Screener, which is a unique computer-based assessment that indicates dyscalculic tendencies by measuring pupils' response timing as well as the accuracy of their answers. Similar solutions can also be created for Dyslexia and other learning disabilities.

Individualized Education Plan (IEP)

An IEP is a prescribed program for children with special needs. After evaluating the type and extent of the child's special needs, a special educator suggests a plan which ensures that the child understands the objectives and keeps pace with the rest of the class. The advantage of an IEP is that it is unique to every child and is an extremely elaborate document that defines the objectives the child is expected to achieve as well as the assignments therein.

Learning Object (LO) repository

This is a database of customized courseware created by TIS, which meets governmental standards. The courseware is created keeping in mind the applicable standards and the varying proficiency levels of learners, and especially to cater for children with special needs. The repository is either a giant database for all grades or a modular repository especially for a grade, school, district, county, or an educational region.

Post Assessment

According to the research, a child with special needs can be assessed for improvement only after two years of teaching. The children require this period to understand and retain the nuances of the subject matter that they have been taught. Hence, the post assessment is held two years after the IEP is prescribed. This is an online test replete with questions drafted with inputs from the SMEs. It is also observed that children with special needs mostly do not completely recover from their learning problems. As a result, the requirement of constant tracking becomes imperative. The performance of all the children with special needs are therefore tracked vis-à-vis that of an average learner to decide whether they need to be given special attention.

Reportage

While tracking is a part of the post assessment stage, it is critical that the system provides data, which helps in analyzing the program's effectiveness. The reportage tool provides reports, which indicate important trends. The data so obtained help in analysis of the reasons behind improvement or decline in the process (such as setting of precise objectives, effective learning objects, or dearth of special educators).

Teacher Training

Research and expert opinion are unanimous that, in most cases, learners with special needs are highly disadvantaged due to their teachers' inability to recognize their unique problems, which are identified too late to be rectified. To address this issue, TIS has designed a "Train the Teacher" program, which can help increase the number of special educators who can work with children facing learning disabilities.

The program has a two-pronged approach wherein:

- The existing teaching staff is introduced to courses that sensitize them to the prevailing special needs problems and enable them to identify children with such problems.
- Nominated teachers are taken through a Special Educator training course, which enables them to analyze the individual problems of children with special needs, counsel them, and prescribe remedial courseware.

TIS is currently working on courses targeting the regular teaching staff from grades K, 1, and 2. The courses are used to create awareness amongst teachers to the unique learning disabilities problems with children. They are also taught classroom management techniques and remedial exercises that equip them to look after the children in a more effective manner. This also helps them benchmark their procedures vis-à-vis the required standards.

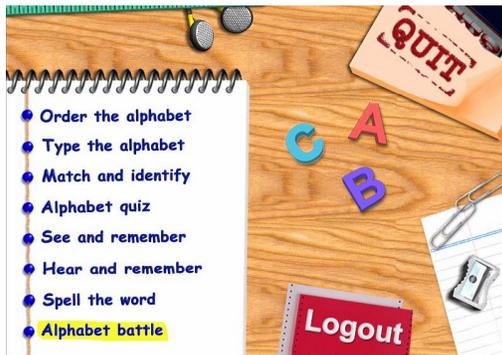
Expertise and Experience

TIS has a specialized team dedicated to the development of accessible e-learning programs catering for the needs of learners across the world. It works with the teams comprising child psychologists and certified Instructional Designers (IDs) in the Senior Specialist Group (SSG) who ensure that its programs adhere to global standards. The development teams work closely with the international SME network, which enables them to model the content according to specific requirements of learners across a wide range of age groups and backgrounds.

TIS' products have not only been endorsed by names like Department of Defense Education Activity (DoDEA) – US, Granada Learning, Nelson Thornes, and Steck Vaughn, but have also won international recognition by the way of prestigious awards including Best Product Award at British Educational Training and Technology (BETT) Show 2004, in the Special Needs category, for nferNELSON's Dyscalculia Screener. TIS has designed, developed, and deployed solutions spanning the entire spectrum of requirements special needs education:

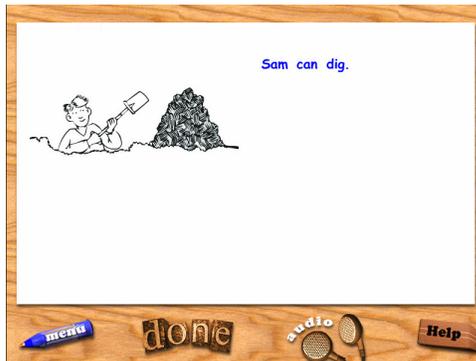
- **Dyslexia**

TIS has developed remedial courseware for children as well as professional development programs for teachers.



Alphabet Track, an interactive CD-ROM for Granada Learning

It was developed as a remedial solution for sequencing problems, e.g., alphabet order, months of the year, and understanding the direction of letters. It targeted pre-schoolers via eight activities, which helped in understanding the sequence of alphabet, vowels, and word spellings.



Word Track, an interactive CD-ROM for Granada Learning

It was developed as a remedial solution for problems in tracking correct spelling of individual words, correct use of capital letters, punctuation, and writing long words.

- **Below Level Readers**

TIS experience includes programs for High School and adult learners and Reading Cards for Grade 4-6

These programs empowered struggling readers to:

- Read at grade level
- Improve test scores
- Recognize vocabulary faster
- Improve reading speed
- Build critical thinking skills
- Improve semantic and phonological recognition



Learning 100 Developmental Reading Program for Steck Vaughn

Tata Interactive Systems helped overhaul Steck Vaughn's Learning 100 Developmental Reading Program with a cross-platform, Web-based solution that was future-proof; it covered 225 cycles across 10 reading levels.

- **Dyscalculia**

TIS developed an assessment program to determine whether a learner was dyscalculic.

**nerNELSON's Dyscalculia Screener**

A unique, award-winning, computer-based assessment that indicates dyscalculic tendencies. This test helps to separate children who genuinely suffer from dyscalculia from those that face similar difficulties for other reasons.

Winner of the Best Product Award in the "Special Needs" category at the British Educational Training and Technology (BETT) Show 2004.

Fostering Special Needs Education Programs

Apart from developing e-learning solutions for learners with special needs, TIS has also been actively associated with initiatives to promote education for children with learning disabilities. In India, TIS mentors the Learning Disability Center at Sion Hospital—the only center in the State of Maharashtra, approved by the State Government to certify students with learning disabilities. More than a sponsor, TIS has been a partner in the phenomenal growth of the clinic. Beyond the salaries and the stationery, TIS helps the clinic with a hands-on approach—whether it's by streamlining the day-to-day functioning or finding solutions to the scores of issues that crop up from time to time. TIS has shared its reservoir of educational software, including the award-winning *Jojo in Numberland*, to help the children discover the joys of learning.

Sources:

1. www.ldonline.org/abcs_info/ld_types.html
2. www.helpguide.org/mental/learning_disabilities.htm