

Teaching Individuals with Severe Learning Deficiencies

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Effective methods for teaching individuals with severe learning disabilities are being evolved by universities and centers of excellence and are today spreading through the educational system. Through extensive research, researchers and educators are developing effective methods to teach individuals with some of the most severe learning difficulties. Once teaching methods have been shown to be effective for learners with severe learning difficulties, these teaching methods can also be incorporated into teaching software.

Severe learning deficiencies can be a combination of a poor ability to:

- imitate
- understand fundamental concepts
- acquire skills rapidly
- generalize skills
- retain and relate information
- communicate effectively or fluently

Depending on the degree of impairment with each characteristic and the learner's prior learning experiences, the learner may be cooperative, slightly uncooperative, to possibly even highly combative in a learning situation.

An individual with severe learning deficiencies generally has difficulty learning and maintaining skills. Additionally, it is often a great challenge to motivate these learners. The less an individual is able to be successful in learning, the more he is focused on a limited set of abilities and interests, no matter how strange, and the greater his ability to tolerate sameness. The individual that has had mostly failure in his learning will usually have a mild to an extreme resistance to trying anything new. He tends to want to stay with what is familiar and be uninterested in, to extremely fearful of anything new. He tends to have repetitious behaviors and limited interests.

The combination of non-compliant behavior toward learning and very poor learning skills generally makes an individual difficult to teach. In such cases, successful teaching of a skill includes the following:

- The skill must be developmentally appropriate for the individual.
- Start where he can not fail and build to where he is independently successful. Control the step size and amount of practice to support success.
- Contrive the learning situation to focus the individual on the critical information.
- Control the setting (stimulation) and the reinforcement to insure that inappropriate behaviors or incorrect responses are not inadvertently reinforced.
- Provide the reinforcement necessary to motivate the individual to do what he may not want to do and may find very difficult.
- Provide sufficient frequency and intensity to minimize relearning and time spent on inappropriate activities.

- Adapt the instructional technique to the individual and continue to make changes as necessary.
- Provide support to generalize the skill.
- Provide support to maintain the skill.

The most successful teaching with an individual with severe learning deficiencies is a long term intensive micro-management of the learning process. The greater the degree of poor learning skills, lack of motivation, and lack of cooperation, the greater the degree that we must micro manage the learning process to be significantly successful. Also the greater degree of poor learning skills the more we have to explicitly teach him/her everything we need him/her to know.

The individual can learn numerous skills and concepts in parallel, and we must know where s/he is on each item to appropriately move each skill along a learning path. We have to know the appropriate level and method of prompting, reinforcement, and instructional technique for each skill and concept we are teaching a learner. We must timely provide the support level and method for each task. Due to these extra teaching demands, it is difficult to significantly teach a very uncooperative learner in a group. The best outcome is with intensive instruction (often 1:1) that complies with behaviorally based teaching methods.

Fortunately, computers are great way of recording and tracking large amounts of data and are capable of providing a wide variety of reinforcers such as music, videos, visual effects, basic cause and effect, and even highly sophisticated games. Inexpensive computers and software could provide a portion of the educational needs of the student.

Unfortunately, commercially available software has little accommodation for an individual with very poor learning skills or for an individual that lacks the ability to cooperate. Here are some of the problems:

- Most software inadvertently reinforces incorrect answers and inappropriate behaviors by making a sound that may actually be reinforcing or a little visual effect that again may actually be reinforcing. Our learner should only receive a sound or visual effect when successful.
- Most software reinforces continuously or very frequently and never fades the reinforcement over time for that particular student. This opposes the fundamental principle of fading the reinforcement to the minimal level necessary to maintain the behavior. From a practical viewpoint, frequent reinforcement also decreases instructional time and thus slows learning. Another consequence of frequent reinforcement is that the reinforcers may more quickly lose their motivational value due to satiation. In fact, stimuli that were once reinforcing can become boring or even annoying over time if over-used and thus de-motivating to the student (Imagine a catchy tune you liked or a funny commercial. What happens after you have heard it about 50 times?) .
- Most software provides little to no ability to choose learner specific reinforcers. Some learners have very specific interests and we need to tap into these interests to gain instructional control and motivate them to learn.
- Most software does not provide an ability to change the reinforcer as needed to keep the reinforcer interesting and motivating. The learner that learns extremely slowly will generally tire of the same reinforcer before s/he learns much from the software.

- Most software does not start from where the learner can not fail (e.g., often the first level begins with a complex response that the learner will have great difficulty responding to). In software terms this means having the capability of presenting only one answer.
- Most software uses very limited prompting and prompt fading to support the student to independent success.
- Most software has limited or no ability to start the learner at an appropriate level in a sequence and provide a learner specific size of steps and amount of practice.
- Most software has limited ability to keep the learner from getting stuck. Exploratory environments usually do not work since our learner will tend to just do the same thing. Our target learner has limited ability to follow instructions and is not well self directed.
- Most software is not structured such that a low functioning learner can be taught to use it independently.
- Most software provides little or no ability to adapt the teaching method. Even with very careful control of the stimulation, some learners will be derailed by software features. If there are no options concerning these features, the software is of no or limited benefit for the student.
- Most software does not focus the learner on the critical concept. Some of the problems are: busy screens, use of drawings and icons instead of photo icons (i.e., photos with backgrounds removed), and lack of careful attention to minimizing or eliminating coincidental but unrelated information (for example the child thinks happy is the person with the red shirt).

Fortunately, software programs can be designed to accommodate the needs of individuals with severe learning deficiencies. A software package called the DT Trainer was designed to teach these individuals and handle the above problems. The DT Trainer:

- Controls the stimulation to insure that inappropriate behaviors or incorrect responses are not inadvertently reinforced.
- Provides complete control over the frequency of reinforcement.
- Contains a large variety of reinforcers and allows users to add reinforcers.
- Allows the user to change the number of and the specific reinforcers at any time.
- Can start by giving the learner only the correct answer to select.
- Combines two methods of prompting and prompt fading.
- Can start the learner at any point in the training sequence.
- Is structured to keep the student from getting stuck.
- Is designed for independent use by even very low functioning individuals.
- Provides defaults for teaching options but allows user to change as required.
- Uses a clean teaching environment and photo icons.

The incorporation of the above features into the DT Trainer allows most individuals, even individuals with very poor learning skills, to become independent learners on the product. A key component is to get the learner to want to do a large amount of work for the length of time necessary. The DT Trainer provides the learner intensity and duration with the most powerful commercially available reinforcement system.

The DT Trainer complies with the basic principles of behaviorally-based teaching methods, and by doing so it taps into what has been demonstrated as the most effective techniques with children with autism and other individuals with severe learning deficiencies. By offering the DT

Trainer affordably, the product is a relatively inexpensive virtual teaching assistant in the classroom or home.

For school use, the DT Trainer provides an extra “teacher” who always knows how to provide a prompt and reinforcer, and always collects data to document student progress.

For home use, the DT Trainer provides a child with more productive learning time which frequently replaces less appropriate activities. Parents are frequently torn between keeping a child with special needs productively engaged or attending to other important tasks. The DT Trainer can give the parents time to attend to some of these tasks while keeping a child engaged learning important skills.

Today, individuals with severe learning disabilities can benefit from the advances in teaching methods performed by human teachers and therapists, and also can benefit by software incorporating the same methods. Since most individuals do not receive the amount of human intervention needed, we need to look to technology to help deliver part of their education. As products like the DT Trainer become available for the range of issues that computers could teach, we will be able to help these individuals go further toward becoming productive members of society.

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