Preparing students with significant intellectual disabilities for work

EDITOR’S NOTE: This article was inspired by an edWeb.net webinar sponsored by STAR Autism Support (www.starautismsupport.com).

Temple Grandin, a woman diagnosed with autism who revolutionized the cattle handling industry, and who is the subject of the movie Temple Grandin, often says she could exist in the workforce because social skills were “pounded into her” during her “1950’s upbringing.”

Grandin’s success in the workforce is rare. National data shows an 81 percent unemployment rate among adults with autism. At least 500,000 children with autism will soon become adults, and will need jobs, homes, and a future, as will those with other disabilities.

How can schools help students with intellectual disabilities achieve success? Grandin’s observations about her upbringing jibe with the understanding that it’s important to give kids skills early on. Schools can do three things:

1. **Start early.** For example, as early as preschool, children can be taught to follow a schedule.
2. **Provide consistent instruction,** with each grade level building on previous skills learned.
3. **Use evidence-based practices.** Reports published by the National Autism Center, www.nationalautismcenter.org, list behavioral interventions proven helpful even for adults. These include:
   - Task analysis (identifying steps needed to perform an activity)
   - Changing antecedents and consequences (changing what happens prior to and after an expected behavior, to change the behavior)
   - Pre-teaching of target skills (isolating the skills needed, and teaching them one-on-one beforehand)
   - Prompting and fading of prompts
   - Positive reinforcement of the target behavior
   - Discrete trial training

Please see **Workforce** on page 6

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- Teaching K-3 to Cont. on page 2
Leveling Up, continued from page 1

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Register by June 7 for Learning Environments for ALL Summer Institute

You have until June 7 to register for a robust summer professional learning experience.

The 2015 Learning Environments for ALL Summer Institute will be held June 15 to 18 at the Hagerty Conference Center, 715 E. Front Street, Traverse City, Mich.

The Summer Institute will offer out-of-the-box thinking, creative solutions to persistent problems, dynamic speakers, and engaging learning opportunities designed to

• improve your ability to teach ALL students
• jumpstart your summer planning (after you relax in Traverse City!)
• improve outcomes and experiences for your students
• address the needs of a diverse range of learners
• inform content area instruction, including literacy, math, social studies, and science

The math strand is constructed to complement and continue the math learning which happens in the (Mi)2 initiatives, including building numeracy, visualization and mathematical modeling, and intervention lessons and strategies.

The conference is low cost. For registration and hotel details, see http://mi2.cenmi.org/professional-learning-opportunities/summer-institute.
Research shows that a Concrete-Representational-Abstract (CRA) approach to teaching students who are struggling and students with disabilities is an effective way to build mathematical understanding.

“Concrete” refers to using physical materials (often called “manipulatives” in the math classroom) that students can touch and move to model and build understanding of math concepts. Examples include using base-10 blocks to teach place value, two-color counters to teach integer operations, and 1-inch tiles to show perimeter and area. I prefer using manipulatives that can be used throughout a child’s education to provide consistency and structure, and to prevent the need for children to learn tools as well as concepts. For example, Algebra Tiles can be used to teach operations on everything from whole numbers through polynomials. Multilink cubes can be used to teach patterns, number, operations, and 3D geometry.

“Representational” refers to a drawing or pictorial version of the concrete. For example, once students understand how to use fraction tiles to add fractions, they can draw the tiles on a piece of paper to accomplish the same end. Representational versions of math concepts are important as students are not tied to having the physical manipulative with them, and can sometimes be more easily adapted to larger numbers, and used on tests.

“Abstract” refers to using numbers and symbols to model the mathematics. A student may use base-10 blocks by placing one ten block and two unit blocks on a mat, followed by three ten blocks and seven unit blocks on the same mat. When the student combines the blocks, he/she will see four ten blocks and nine unit blocks, and see that the answer is 49. Once a student is comfortable with that model, he/she may not need to use the blocks, but could draw the blocks on a piece of paper, and use arrows or circles to show how the quantities are being combined. When the student writes $12 + 37 = 49$ he/she is working at the abstract level – using only numbers and symbols to show what is happening.

Technological advances offer a 4th layer to the CRA model: virtual. Virtual manipulatives are available, often free, on a variety of websites and apps. Research shows that using concrete manipulatives is important, and using virtual manipulatives can also be important, but using both can have the most positive impact on student learning.

Teachers should not skip steps when presenting math using the CRA model. Virtual manipulatives are not a replacement for the concrete as they cannot be
picked up, handled, or used beyond the limitations of the app or website. However, virtual manipulatives, used in conjunction with the CRA model (usually in between concrete and representational) are a good addition to a math teacher’s toolbox.

Virtual manipulatives may also address learning needs beyond the conceptual. For students with fine motor control challenges, virtual manipulatives remove the need to physically manipulate small items. For learners with limited spatial skills, virtual manipulatives may help keep the objects aligned and proportionate (especially important for objects such as fraction tiles or area models).

Glencoe offers a free, user-friendly set of online virtual manipulatives. Users may use the menus on the left of the screen to choose different types of commonly used manipulatives that are easy to place, move, and delete from the mat. Virtual tools at the bottom of the screen allow students to annotate and interact with the manipulatives on the mat. There are multiple choices for work mats (under “backgrounds”) allowing users to use the same manipulative in different ways. For users unsure where to begin, resources are also filtered by grade level.

The National Library of Virtual Manipulatives (NLVM) has been around for a long time and is a common go-to site for applets of many types of manipulatives. Depending on the tool, the NLVM offers virtual manipulatives as simply manipulatives (drag, drop, and move), as applets, or as more active workspaces for users.

Finally, one teacher has figured out how to use Google Draw to make virtual manipulatives in a collaborative, online environment, working seamlessly with her Google-tool classroom.

A variety of options exist for those ready to explore virtual manipulatives. These are just a few. For those with access to technology, looking for ways to engage and teach students who struggle, virtual manipulatives can address a variety of learning needs.

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At a glance
Game: Ratio Rancher
Cost: Free
Platform: Google Chrome
Topic: Ratios for grades 6-12
How to get: Go to http://www.glasslabgames.org/

Ratio Rancher
Created by GlassLab Games
Reviewed by Becky Palmer-Scott

It’s always a pleasure to find truly good educational games, and we have discovered a treasure trove. GlassLab Games, a relatively new learning game development house associated with the Institute of Play, brings together team members from the worlds of commercial games, educational technology, and academic research in learning and assessment. The result: games that are both engaging and educational.

GlassLab’s most recent offering, Ratio Rancher, is designed to teach the fundamentals of ratios to 6th- to 12th-graders. Pre-release field testing of the game showed that in a matter of days, players learned concepts that normally take months for students to grasp. Understanding ratios is important, because they are integral to 42 percent of middle school and high school math. Yet most students score poorly on ratio and proportion questions in the National Assessment of Educational Progress (NAEP) exam. When more than 400 students played Ratio Rancher for three 40-minute sessions, the students showed significant learning gains.

The premise of the game is that the player is a rancher taking care of creatures with precise food needs. As more creatures are cared for, the food need increases proportionately. And as creatures get older, their food needs become more complex, gradually increasing the difficulty of the game.

The game itself is attractive and funny. The animals, which look both cute and disturbing, poop after being fed, and will vomit if fed too much. Although the game includes an animal care manual, at times the player must experiment with feeding, adding a sense of discovery and exploration.

Ratio Rancher includes real-time reports that track student learning and progress, a feature it has in common with all GlassLab games.

If there is a drawback to Ratio Rancher, it is that you may have trouble getting it to work on browsers other than Google Chrome. In addition, it doesn’t play well with older systems such as Windows XP.

Do you know of good learning games you would like to tell others about? Write to our editor at SpecialEdTechEditor@gmail.com.

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In other words, the answer is to teach routines and related lessons. Routines are the activities students do throughout the day so they can be more independent, such as the routine for behavior in a cafeteria, or routine for changing classes.

Lessons teach the foundational skills needed to perform routines, such as purchasing an item and telling the difference between a dollar and a quarter.

For example, to help students learn how to gather and sort recyclables from each schoolroom at a certain time of day, a recycling routine was broken down into four lessons:

1) identifying the location of the rooms,
2) sorting items into categories,
3) the social skills of being part of a recycling team, and
4) identifying the associated time and schedule.

The children were given a written checkoff schedule to see which room to go to. Pre-teaching was given to help students match words to pictures -- this included a lot of positive feedback during instruction. To help them along, children were given verbal cues (telling them what to do), and modeled cues (Watch me!).

Teaching more complicated skills, such as how to go on a job interview or perform a job, can also be broken down into routines, lessons, cues, and expected behavior. To this end, the LINKS Curriculum is a useful tool. In addition to ready-made curriculum, it provides templates for teachers to document the cues and expected behavior which comprise a routine.

The screen shot below shows the LINKS template for documenting a routine.

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Please see *Workforce* on next page.
**Workforce, continued from previous page**

The LINKS Curriculum is a systematic progression of routines and lessons designed to give students the skills for independence. Circled on the chart below are skills associated with job interviews, as identified by LINKS.

<table>
<thead>
<tr>
<th>Learning Level</th>
<th>Embedded Lessons</th>
<th>Responding to Language</th>
<th>Communicating with Others</th>
<th>Functional Academics</th>
<th>Learning How to Engage in Diverse Activities</th>
</tr>
</thead>
</table>
| **Essential**  | • Using Reinforcement Systems  
• Appropriate Behavior  | • Modeling Motor Skills  
• Object Use  
• Matching Concepts  
• Following Simple Directions  | • Verbal and Augmentative Communication  
• Making Requests  | • Identifying Survival Signs  
• Colors and Shapes  
• Numbers  
• Writing  | • Safety Commands  
• Using Visuals to Obtain Objects and Find Locations  
• Following Sequences  |
| **Intermediate**  | • Using Intermediate Reinforcement Systems  | • Following 1 and 2 Step Directions  
• Identifying Nouns, Verbs, and People  
• Grouping  
• Understanding Intermediate Level  | • Describing Sequences  
• Functions  
• Nouns, Verbs, and People  
• Answering and Asking Simple Questions  | • Reading  
• Counting and Differentiating Between Numbers  
• Money  
• Intermediate Level Writing  | • Social Interaction  
• Identify Options  
• Simple Projects  
• Using Intermediate Level Schedules  |
| **Advanced**  | • Using Advanced Reinforcement Systems  
• Nonverbal Behavior  | • Following Multiple-Step Directions  
• Identifying Prepositions, Adjectives, and Possessives  
• Understanding Emotions  
• Understanding Advanced Level Schedules  | • Describing Content in a Book  
• Using Prepositions and Adjectives  
• Answering and Asking Personal Questions  
• Describing 4 Part Sequences  | • Reading  
• Counting Groups  
• Understanding the Value of Money  
• Advanced Level Writing  | • Community Activities  
• Multiple-Step Projects  
• Using Advanced Level Schedules  |
| **Traditional**  | • Using Social Reinforcement  | • Understanding Environmental Cues  
• Responding to Unexpected Events  
• Understanding Complex Directions  | • Using Various Phrases to Make Requests  
• Communicating in Response to Environmental Cues  | • Refer to General Education Curriculum  | • Demonstrating Positive Behavior  
• Solving Unexpected Events  
• Solving Problems  
• Creating and Using a Traditional Schedule  |

*Please see Workforce on next page*
**Workforce, continued from previous page**

LINKS translates the job interview routine into cues and behaviors, as shown on the chart below. Related lessons are also identified.

### Routine: Interviewing for a Job

#### Observed Routine Assessment
- **Angle:** Job Interview
- **Cue Set Number:** 1

Observe Angie performing the Job Interview routine in the natural environment. Cue the student with the previously selected cues and score the student using the Links Independence Scoring Scale. When you are finished observing the student performing the routine, you may return to Links online and enter data for this routine. Use this data to identify steps for instruction and teach the corresponding lessons (bolded lessons are priority lessons).

<table>
<thead>
<tr>
<th>#</th>
<th>Cue</th>
<th>Expected Behavior</th>
<th>Date:</th>
<th>Date:</th>
<th>Date:</th>
<th>Date:</th>
<th>Cue Level Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Practice interviewer says &quot;hello.&quot;</td>
<td>Student greets practice interviewer.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Practice interviewer extends hand.</td>
<td>Student shakes hand of practice interviewer.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Practice interviewer asks simple questions about previous experience with visual reminder strip present.</td>
<td>Student answers simple interview questions about previous job experience using a &quot;reminder visual strip.&quot;</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4</td>
<td>Practice interviewer asks simple question about job preference(e.g., Do you prefer to work outside or at a desk?).</td>
<td>Student answers questions about preferred type of job.</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>Practice interviewer says &quot;do you have any questions&quot; and show visual question template.</td>
<td>Student asks a question about the job using a &quot;question template.&quot;</td>
<td></td>
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<tr>
<td>6</td>
<td>Practice interviewer says &quot;are you interested in this job?&quot;</td>
<td>Student indicates interest in the job.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Practice interviewer says &quot;goodbye.&quot;</td>
<td>Student says &quot;thank you&quot; and shakes hand.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Interview is over.</td>
<td>Student leaves interview location.</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>

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LINKS also provides social stories in visual format, as a teaching aid.

To learn more about the LINKS Curriculum tool and training, visit [www.linkscurriculum.com](http://www.linkscurriculum.com).

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