Implementing Work Systems across the School Day: Increasing Engagement in Students with Autism Spectrum Disorders

Kara Hume and Beth Reynolds

ABSTRACT: Work systems provide visual information and organization for students with autism spectrum disorders (ASD) and assist in increasing on-task behavior and productivity while simultaneously decreasing adult prompting. Work systems are a core component of the Treatment and Education of Autistic and Related Communication-Handicapped Children comprehensive treatment model for individuals with ASD. Work systems are used in school settings to facilitate student understanding of adult expectations, promote task completion, help with organizational skills, sequencing abilities, and increase flexibility. Work systems also support skill generalization and have been implemented successfully across school and work settings. The authors provide a review of the research supporting the use of work systems, a rationale for implementation and a description of implementation steps, and examples of application with students across age ranges and ability levels.

KEYWORDS: autism spectrum disorders, on-task behavior and productivity, TEACCH treatment model, work systems

THE AMOUNT OF TIME THAT A STUDENT with autism is actively engaged in or attending to activities and interactions has been cited as one of the best predictors of long-term student outcomes (Iovannone, Dunlap, Huber, & Kincaid, 2003; Koegel, Koegel, & Mcnerney, 2001). However, characteristics related to a student’s autism often make active engagement in the school setting difficult. Deficits in joint attention and imitation may make it difficult for students with an autism spectrum disorder (ASD) to observe and replicate staff behavior, peer behavior, or the behavior of both (Thurm, Lord, Li-Ching, & Newschaffer, 2007). Difficulties in executive function (one’s ability to carry out purposeful, goal-directed behavior) may impair a student’s ability to organize himself or herself or materials to successfully engage in classroom tasks (Hill, 2004). In addition, difficulties in independent functioning make it less likely that students with ASD will appropriately engage with classroom materials without direct support from staff (Dunlap & Johnson, 1985). A student’s inability to function independently may result in poor long term outcomes for adults on the autism spectrum (Eaves & Ho, 2008).

To increase active engagement and improve independent functioning in students with ASD, instruction must be tailored to meet the needs of the student (Iovannone et al., 2003). Division Treatment and Education of Autistic and Related Communication-Handicapped Children (TEACCH), a comprehensive treatment model serving students with ASD, developed a set of teaching strategies that are designed around the characteristics of autism that affect learning (Mesibov, Shea, & Schopler, 2005). These combined strategies, referred to as structured teaching, modify the environment and instruction through an emphasis on visual information and external organizational support. The modifications—which include explicit organization of a student’s environment, materials, and learning experiences—assist in making the environment more meaningful for students and increase academic and adaptive skills (Mesibov et al.). The four major components of structured teaching are (a) physical structure, which refers to the organization of the classroom; (b) visual schedules, which refer to visual information depicting where and when the activity will take place; (c) work systems, which refer to visual information informing a student what to do; and (d) task organization, which refers to visual information describing how to complete an activity (Schopler, Mesibov, & Hearsey, 1995).

Address correspondence to Kara Hume, University of North Carolina at Chapel Hill, FPG Child Development Institute, 517 South Greensboro Road, Carrboro, NC 27510, hume@mail.fpg.unc.edu (e-mail).
A number of studies have shown the emerging efficacy of structured teaching strategies (e.g., Ozonoff & Cathcart, 1998; Panerai, Ferrante, & Caputo, 1997; Panerai, Ferrante, Caputo, & Impellizzeri, 1998; Probst & Leppert, 2008; Tsang, Shek, Lam, Tang, & Cheung, 2006). These strategies have been effective in reducing problem behavior in elementary-aged students with autism (Probst & Leppart). Specifically, Probst and Leppart found significant improvements in the areas of independent functioning, following directions, and responding to verbal cues after the implementation of structured teaching strategies. Additional studies have shown the effectiveness of structured teaching methods for promoting the independent performance of young children with autism during work sessions and transitions (Panerai et al., 1997; Panerai et al., 1998), reducing self-injurious behavior (Norgate, 1998), and increasing the vocational skills in individuals entering the job market (Keel, 1997).

Research also has been conducted on several of the individual components of structured teaching—primarily on physical structure (e.g., Rutter & Bartak, 1973; Schultheis, Boswell, & Decker, 2000) and visual schedules (e.g., Bryan & Gast, 2000; Kimball, Kinney, Taylor, & Stromer, 2004; Massey & Wheeler, 2000). Both components are widely used and have a large body of evidence supporting their use with students with ASD. Both strategies met the criteria of the National Professional Development Center on Autism Spectrum Disorders (PDA) to be deemed evidence-based practices (two high-quality experimental or quasiexperimental group design studies, five high-quality single-participant design studies, or a combination of the two types of high-quality evidence). Recent studies have focused on an additional component of structured teaching—the work system (Hume & Odom, 2007). Hume and Odom implemented work systems with two young students with ASD during independent play and one adolescent with ASD at his employment site. Hume and Odom found that all students increased productivity and engagement (measured by numbers of tasks completed and percentage of time on task), whereas adult prompts simultaneously decreased. The two young students increased appropriate use of materials and used a broader range of play materials, thus increasing flexible use of materials and decreasing student rigidity. In addition, after the implementation of a work system at his job site, the young adult with autism showed higher levels of on-task behavior independent of adult prompting.

In an extension of this study, Hume and Odom (2009) implemented a work system for three elementary-aged students with autism in their special education setting during independent work time. Hume and Odom used the work system to facilitate the academic skills of these students. They then measured how the students performed these same academic skills in their general education setting without having access to the work system. All three students showed improved generalization of skills across both settings after only using the work system in the special education setting. In addition, students increased their time on-task and ability to complete tasks independent of adult support (Hume & Odom).

What Are Work Systems?

A work system is an organizational system that provides students with visual information about what to do. Work systems are different from visual schedules because visual schedules primarily indicate location and instruct a student where to go. A work system answers questions about what is to be done once a student arrives at the scheduled location. Work systems try to provide students with ASD with a meaningful and organized strategy to help them start and complete a number of tasks or activities (Mesibov et al., 2005). Work systems visually answer four questions for students when they arrive at an assigned location—such as the mathematics table or cafeteria—or when they are expected to complete an assigned activity or routine, such as participating in a group project or turning in homework. The following are the four questions that work systems should answer for the student:

1. What task or activity is the student supposed to complete?
2. How much work (or how many tasks) is required during the specific work period or how long will the activity last?
3. How will the student know that progress is being made and that the activity is finished?
4. What happens next, after the work or activity is finished? (Mesibov et al., 2005).

Information in a work system is presented visually to students based on the developmental level of the child and can range from pictures or objects for those who are more concrete learners to written lists for individuals with strong reading and comprehension skills. This visual information assists students in understanding that they are making progress in activities, and helps emphasize a sense of competence and closure when an activity is complete (Mesibov et al., 2005). In addition, work systems can reduce anxiety by providing a predictable structure to activities and tasks across a variety of settings. Later in this article, we describe examples of a variety of work system formats and steps required for implementation.

Reported Benefits of Using Work Systems

Work systems assist in increasing independent performance, task completion, and on-task behavior among individuals with autism (Hume & Odom, 2007). Hume and Odom implemented work systems with two young students with ASD during independent play and one adolescent with ASD at his employment site. Hume and Odom found that all students increased productivity and engagement (measured by numbers of tasks completed and percentage of time on task), whereas adult prompts simultaneously decreased. The two young students increased appropriate use of materials and used a broader range of play materials, thus increasing flexible use of materials and decreasing student rigidity. In addition, after the implementation of a work system at his job site, the young adult with autism showed higher levels of on-task behavior independent of adult prompting.

In an extension of this study, Hume and Odom (2009) implemented a work system for three elementary-aged students with autism in their special education setting during independent work time. Hume and Odom used the work system to facilitate the academic skills of these students. They then measured how the students performed these same academic skills in their general education setting without having access to the work system. All three students showed improved generalization of skills across both settings after only using the work system in the special education setting. In addition, students increased their time on-task and ability to complete tasks independent of adult support (Hume & Odom).
Rationale for Reported Benefits of Work Systems

The literature identifies several potential reasons for the increases in on-task behavior and decreases in adult prompting after the introduction of the work system into the student’s classroom routine. Heflin and Alberto (2001) asserted that providing elements of temporal structure to students with ASD assists in increasing attention to task. Thus, visually presenting a sequence of activities (by setting the student’s tasks out for them to see) allows the students to see upcoming activities and provides a consistent routine for gathering information about what is coming next. The visual information provided through the work system also may increase on-task behavior by capitalizing on the often apparent visual-spatial processing strengths of many students with ASD (Garrettson, Fein, & Waterhouse, 1990). Studies have indicated that students with autism are likely to attend only to select parts of a verbal message and often fail to process multisensory stimuli (Burke & Cerniglia, 1990). This processing difficulty may explain why students may have difficulty responding to multiple verbal cues by staff members, but may respond more favorably to the visual cues of a work system. In addition, the work system was designed specifically to address the organizational limitations of students on the autism spectrum as well as to reduce competing information that may be distracting (Mesibov et al., 2005).

Steps for Implementation

The following recommended steps for implementing work systems in the school setting are based on the work of Hume and Carnahan (2008) and the National Professional Development Center on ASD.

Step 1 (“What Work?”)

First, staff must choose an activity or series of activities that a student with ASD is having difficulty attending to, engaging with, or completing. This may be activities during an academic group, a choice period, lunch time, an independent work session, or a social activity such as games or gross motor play. The following questions may help staff decide if a work system could be an effective intervention to implement:

Off-task behavior

- Does the student get stuck during the activity or sequence of activities and appear not to know how to move on?
- Does the student require an adult to walk him or her through each step of the activity?
- Is the student off task or unengaged throughout much of the activity?

Disorganization

- Is the student disorganized during the activity?
- Does the student have difficulty understanding when he or she is finished with an activity (e.g., turns in assignments with portions missing, or continues to work on a task when it is clearly finished)?

Anxiety, rigidity, or both

- Does the student ask repeated questions about upcoming activities?
- Does the student have difficulty being flexible with materials or activity expectations? For example, does the student expect to read the same book every time he or she attends reading group?

Step 2 (“How Much Work?”)

Next, the teacher should assess the student to determine the type of work system that may be appropriate for the child. The most concrete type of work system for students with ASD is a basic left-to-right work system. The left-to-right format is used to reinforce the direction in which one reads and this left-to-right routine is used across several structured teaching strategies. The actual tasks the student is to complete, or a visual representation of those tasks, are placed to the student’s left and to the right of the student is a place to put completed or finished tasks. If the activity involves multiple steps, then it can be visually arranged in a way that would help the child complete a sequence of steps. For example, if the selected activity is to complete an art project in an elementary setting, a left-to-right work system may include a pair of scissors in a small basket on the student’s left, followed by a small basket with glue, and another small basket with crayons indicating the steps needed for completion (see Figure 1).

Students who have mastered matching and sequencing may respond best to a matching work system. In a matching work system, students match a sequence of visual symbols to containers holding required tasks that are to be completed. For example, a student may use a matching work system to complete art activities. The work system may include
sequence of three-colored circles placed on the student’s table in front of his or her work area. The student then matches the first colored circle to a basket on the shelf that has the corresponding colored circle. The scissors, paper, and glue required to complete the first activity would be located in this basket. Additional materials to complete the other two projects are located in the second and third baskets with corresponding circles (see Figure 2).

Students who are able to follow visual or written sequences may benefit from using a list work system. The list is a top-to-bottom sequence of activities presented in a picture or written format. For example, during an art activity the sequence of steps required for completion may be written on a small dry erase board (see Figure 3).

Step 3 (“How Do I Know when I’m Finished?”)

The next phase of the assessment is to determine how the student will best understand that progress is being made in an activity or series of activities and the concept of finished. Concrete learners may best understand the abstract concept of finished by placing pieces or parts of an activity or the completed activity in a designated finished location, such as on a shelf or basket placed to the student’s right, as shown in Figure 1. Other students with a greater understanding of abstract concepts may “return the materials to their designated location when finished,” as shown in Figure 2, whereas others may find it meaningful to “cross items off or remove items” from their work system list, as shown in Figure 3.

Step 4 (“What’s Next?”)

The final phase of the assessment is for staff to determine how the what’s next information will be conveyed to students. Visual information (e.g., photograph, object, written word) must be provided to a student to inform him or her of the next activity. This could be a preferred activity or may simply be the next activity on the student’s schedule. Depending on the comprehension level of the student, the visual information could be presented using objects, photos, icons, or written words (see Figures 1–3).

Step 5

Step 5 is to teach the student how to use the work system. It may be most beneficial to teach work system usage in a structured 1:1 teaching setting before implementing the work system in a group activity (e.g., group art project). Students should be taught how to manipulate the system, where to place materials when finished, and how to move to the next scheduled activity. Teaching the work system involves a combination of hand-over-hand assistance, visual prompts, simple verbal cues, and a desired activity as the what’s next component (Mesibov et al., 2005). This combination must be individualized depending on the needs of the student. The eventual goal is that the student can manipulate the work system independently, though they still may require instruction about the tasks or activities that will occur within the work system. To facilitate this independence, we recommended primarily nonverbal prompting. We also recommend the staff member stand behind the student to prompt—out of the student’s visual field—so that prompts can be more easily faded over time. Once a student understands the work system and is able to manipulate it independently, the work system can be implemented across settings and activities.

Step 6

The final step is to begin implementing the work system across a student’s day. Ideally, whenever a student arrives at a designated location or activity, the four questions should be answered visually for the student. As students become adept in the usage of work systems and master additional skills such as matching or sequencing, the formats can change (as previously described). Work systems can also easily become portable to support students in the
community or across the school environment (e.g., a written list of locations that will be visited during a community based outing, a left-to-right work system used at a job site). Last, data collection on student use of work systems, as well as student behavior while using the work system, is also an essential component of implementation. Collecting data on the level of adult prompting is recommended, as adult prompting should decrease over time (moving from physical prompts, if needed, to independence). Collecting data is useful because it indicates whether adjustments need to be made to the implementation of the work system. Adjustments in format and type of work system may be necessary if changes in student behavior are not observed, or if students are not gaining independence in the manipulation of the work system components. Examples of implementation across setting and skill area can be found in the case examples and in Figures 4–6 and in the Appendix.

Conclusion

The use of work systems is supported both by the research findings previously described as well as by shifts in the broader autism literature. Current literature calls for supports such as work systems that modify or alter environments to match the behavioral needs of students with autism, rather than changing the students to fit the environment (Horner, Carr, Strain, Todd, & Reed, 2002). Recent literature also has indicated that students with autism require a comprehensible, structured learning environment (Heflin & Alberto, 2001; Iovannone et al., 2003), and has emphasized positive and proactive approaches that reduce reliance on extrinsic reinforcers (National Research Council, 2001). The work system responds to this call. It is an antecedent-based preventative intervention, which means that work systems use the visual-spatial strengths of children with autism to intrinsically motivate them to complete academic or work tasks, and it uses natural contingencies (the what’s next component of work systems). Last, the National Research Council identified the development of independent organizational skills for students with autism—described as the ability to complete tasks independently and follow group directions—as one of six recommended areas for intervention and instruction. Beyond the empirical evidence highlighting the efficacy of work systems, educators who have implemented them have also strongly supported their use. Several studies have indicated that for special and general educators who have implemented work systems, the procedures were favorable and that work systems continued to be used in classrooms beyond the scope of the studies (Hume & Odom, 2007, 2009). The steps provided in the current article, along with the troubleshooting section below, the case examples, and figures should allow for successful implementation and in turn, an increase in student engagement and independence for students with ASD.

Troubleshooting

The following are several questions that may arise when developing and implementing work systems with students with ASD:

![FIGURE 4. A left-to-right work system with a finished location and a “what’s next” object.](image)

![FIGURE 5. A matching work system in which students put back the materials when they are finished and a “what’s next” picture.](image)

![FIGURE 6. A picture list work system in which students remove pictures when student is finished and a “what’s next” picture.](image)
1. “How do I decide what type of work system to implement with a student?”

Making decisions about work system format requires careful consideration of student characteristics. An understanding of the student’s developmental level and his or her comprehension of abstract concepts such as written language or two-dimensional representations (photographs or line drawings) is required. In addition, an assessment of cognitive skills (e.g., matching, sequencing), ability to attend to task, behavioral challenges, and independent functioning is necessary. Once this information is gathered, staff members can make decisions about how to answer the four questions for students (e.g., left-to-right system, crossing items off when finished, matching pictures). The key concept that teachers should remember is that independent use of the work system is the goal. When developing the work system it is important to choose components that will be best understood by students. For example, if a student responds most favorably to objects, it is best to choose a left-to-right work system which would allow for independence quickly, rather than choosing a written format which will require a great deal of staff facilitation. Staff members should select a work system format that can be used by the student independently (after some initial instruction) on his or her worst day. For example, if reading is a new and fragile skill, and comprehension is questionable, it is best to choose a left-to-right or matching format rather than a written format. The case examples, Figures 4–6, and the Appendix can also assist in answering this question.

2. “How do I make decisions about moving students from one type of work system to another?”

Data collected on student performance and adult prompting level during work system use guides the decision-making process when changing work system formats. If the data indicate that students are consistently independent in the manipulation of the work system components (e.g., moving items to the finished location, beginning the next task, moving to the next activity) and that students have gained the required skills to understand a more abstract format (e.g., matching, sequencing, reading), it may be appropriate to introduce a new format. The benefit of introducing a new format (e.g., moving from a matching work system to a written work system or moving from a finished basket to putting things back on a shelf when finished) is that the more advanced systems replicate organizational systems that are more likely to be used in general education and community-based settings. This shift increases the ease of implementation for program staff members and the likelihood of generalization to a variety of settings. For example, it may be easier for a general education teacher to provide a written to-do list for a student with ASD rather than setting up a left-to-right work system. Further, it is more typical for students to put materials back where they found them rather than placing them in a finished basket. However, because the goal is independent use as previously described, it is vital that decisions about moving students from one format to another are carefully made. When a new system is developed and implemented, it is important that it is explicitly taught to the student as described in the text.

3. “How can I increase student interest in using the work system?”

Incorporating student interests into the work system is recommended to increase student interest and motivation if necessary. For example, if a student uses a matching work system during a reading group, the student may match pictures of interest (e.g., photos of favorite television characters) that indicate the sequence of activities to be completed. Or, if a student uses a written work system during an independent work period, his or her what’s next activity may incorporate a special interest, such as looking through sports cards or bus schedules. However, when embedding student interests in the work system, it is essential to determine how distracting this high-interest item or character may be for the student. If its presence disrupts the student’s ability to work independently, then it will be necessary to reevaluate. Perhaps another preferred item that is not as distracting for the student should be incorporated by staff into the work system.

**AUTHOR NOTES**

Kara Hume is an investigator at the Frank Porter Graham Child Development Institute at the University of North Carolina at Chapel Hill. Her research interests are efficacy of structured teaching strategies, implementation practices of classroom teachers serving children with autism spectrum disorders. Beth Reynolds is a Psychoeducational Therapist at Division TEACCH at the University of North Carolina at Chapel Hill. Her research interests are the use of structured teaching to increase joint attention and play skills in young children with autism spectrum disorders.

**REFERENCES**


Hume, K., & Odom, S. (forthcoming). Effects of an individual work system on the independent demonstration of task fluency and generalization in students with autism. Manuscript under review.


APPENDIX
Student Profiles

Student: Chris, age 3
Setting: Early childhood classroom
Activity: Preacademic activities
Teacher concerns: Chris had great difficulty attending to task; aggressive behavior during work activities
Student interests: Letters and numbers
Comprehension level: Print/photos are not yet meaningful to Chris

How 4 questions are answered:
How much work?: Chris could see how many tasks were on the shelf to his left.
What work?: Chris could see the specific tasks on the shelf to his left.
Progress: Chris knew he was making progress when the tasks on his left were completed and put in the finished basket to his right. The shelf was emptying and the finished basket was filling.
What’s next? An object directed Chris to his next activity—a small plastic fish which directed him to the water table.

It was important that Chris knew how long his work session would last, and if he was making progress toward being finished. Staff began using a left-to-right work system with him for short periods of time during adult instruction. The activities he needed to complete were placed on a shelf to his left and a large finished basket was placed to his right. The first few times Chris used his work system, he did two very short activities related to letters and numbers with just a few pieces so that he could be successful. Staff did the activities together either hand over hand or modeled them and then Chris put them in the finished basket. Chris began to understand the once activities were placed in the finished basket that he would not be expected to do them again at that work session.

After Chris completed the tasks and placed them in the finished basket he was taught to look back on the shelf to his left. At the end of his task sequence was an object that helped him transition to the next activity. Often it was a small plastic fish which he used in the water table, a highly preferred location in the classroom (see Figure 4).

After 8 work sessions using the left-to-right work system, the staff’s data indicated that Chris had increased his time of task and reduced his challenging behavior during work time by 85%. Staff noted that Chris began to trust the work system and could anticipate before sitting down how much work was expected and what activity would be occurring next.

Student: Brooks, age 14
Setting: High school classroom
Activity: Academic activities
Teacher concerns: Brooks was disorganized in class; disruptive when assignments were finished; rarely turned in homework
Student interests: History and drawing
Comprehension Level: Reads and comprehends on 7th grade level

How 4 questions are answered:
How much work?: A written list in his folder outlined the number of activities
What work?: A written list clarified what activities will be completed.
Progress: Brooks crossed off activities as they were finished and put completed work in the right side of his folder.
What’s next? The next activity was written on his list.

The resource teacher that supported Brooks in his general-education class decided to provide him with a written list work system inside his folder for each class. On the left side of the folder was a “To-Do” list that gave him information about what activities would be completed. As each activity was finished, he would cross it off, and place completed materials in the right side of the folder. In addition, the staff created a folder of activities that Brooks could complete when his activities were finished, primarily activities related to history and drawing.

The steps on his written list work systems were typically as follows:

<table>
<thead>
<tr>
<th>To Do in Math:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turn in your homework</td>
</tr>
<tr>
<td>Review questions</td>
</tr>
<tr>
<td>Teacher’s time—</td>
</tr>
<tr>
<td>take notes</td>
</tr>
<tr>
<td>Class work: Page 49</td>
</tr>
<tr>
<td>Write down homework</td>
</tr>
<tr>
<td>Drawing activity if time</td>
</tr>
<tr>
<td>Go to English class</td>
</tr>
</tbody>
</table>

Brooks’ math teacher was the first to remark how much more engaged Brooks was and how his participation had increased. The teachers liked this system so much that they started putting his list on a dry erase board so they could easily adapt it each day in class. He turned in homework more often and disrupted the class far less while using his work system.

(Continued on next page)
APPENDIX
Student Profiles (Continued)

Student: Ella, age 10
Setting: Elementary school classroom
Activity: Academic activities
Teacher concerns: Ella often ran from classroom; asked repetitive questions about leaving classroom
Student interests: Science
Comprehension Level: Understands pictures, can sequence

How 4 questions are answered:
How much work?: The number of photos indicated the number of activities to complete in class.
What work?: Photos represented the activities to be completed.
Progress: When each task was finished, Ella took it out of the flip book and placed it in a finished pocket.
What’s next? Ella’s final photo directed her to the computer in her classroom.

The special education teacher met with the general education science teacher and reviewed the upcoming lesson plans. She then took photos of each area and activity that the students would be visiting or doing during science class. These included a photo of her desk, the group table, the white-board area, the discussion rug, the listening center, and the lab tools. She then assembled them into a flip book (a photo list work system) which provided visual information for Ella about the tasks and activities that would occur in science class. As Ella completed each activity, she removed the picture from the flip book and placed it in a small “Finished pocket” attached to the back of the book. At the end of the flip book was a picture of a computer in the special education class, which indicated where she was to go next.

Student: Max, age 12
Setting: Middle school gym
Activity: Physical education (PE)
Teacher concerns: Max had great difficulty when PE was over; often appeared anxious during class; wanted to complete activities in the same order every week
Student interests: Movement activities
Comprehension level: Nonreader, can sequence

How 4 questions are answered:
How much work?: The number of colored squares on his work system indicated how many activities he would complete in gym class.
What work?: Max could scan the gym and see what stations had his matching squares next to them.
Progress: When each square was removed from the work system and matched to the station, Max could see he was making progress and how many were left until he was finished.
What’s next? A photo at the end of his work system indicated where he was to go next (back to his classroom).

The physical education teacher decided to implement a matching work system for Max to help him to better understand when the class would be finished. She made a cardboard strip that had 6 colored squares attached to it with Velcro. At each station Max was going to visit in the gym, such as weight lifting, basketball, or bowling, there was a corresponding matching square. When it was time for Max to rotate to a new center, he would take the next colored square off of his work system and match it to the corresponding square at each station. He would then put his materials away from that station and go back to his work system for more information. Max could see how many activities he would complete in PE when he entered the gym, and he could see the squares disappearing from the board as each activity was finished. At the end of the sequence of squares was a photo of his classroom which indicated it was time to transition back to the room.

The PE teacher was pleasantly surprised at the reduction of off-task and disruptive behavior, and encouraged by Max’s increased flexibility. As long as the work system was available, Max was to be able to follow the given sequence of activities rather than his own routine (see Figure 5).
Student: Amber, age 5
Setting: Early childhood classroom
Activity: Dramatic play center
Teacher concerns: Amber was very rigid in her play; demonstrated aggression when other students were using her preferred play materials
Student interests: Playing dress-up
Comprehension Level: Understood icons (drawings or illustrations that represented an activity)

How 4 questions are answered:
How much work?: The number of icons on her work system represented the number of activities she would be completing in the center
What work?: The icons represented what play schemes she would be using while in the center
Progress: As Amber finished each play scheme she would turn over the icon and place it back on the work system. When all of the icons were turned over, she knew she was finished.
What’s next? An icon representing the next activity was placed at the end of the work system.

Amber’s teacher taught her a number of dramatic play schemes, such as baker, teacher, and magician, in a 1:1 teaching setting and Amber enjoyed all of them. When she went to the dramatic play center, however, she chose the doctor materials every time and became extremely agitated and aggressive if other children were using those materials. Her routine was so strong that she was not able to access the materials for the other play schemes she seemed to enjoy so much when playing with the teacher.

To expand her play routines and to assist in sharing materials with other children, her teacher implemented a picture list work system in the dramatic play area, similar to the one used in the 1:1 teaching sessions. All of the materials needed for each play scheme were placed in boxes and labeled. When Amber arrived in the dramatic play center, she was directed to her work system which had several icons guiding her to different play schemes. After she was finished with each play material she would place it back in the box and turn the icon over on her work system. An icon at the end of her work system represented what she was to do when she was finished.

These icons were consistently placed in different orders and rotated frequently to teach Amber greater flexibility in her play. The work system also assisted in reducing aggression, as Amber could see when it would be her turn to use the doctor materials by looking at her work system (see Figure 6).