

## Electronic Performance Support Systems for Teachers and Young Children with Disabilities

### *Abstract for Presentation*

#### **Abstract** (50 words)

Presentation demonstrates an EPSS for young children, *PictureTools*, developed as part of a Steppingstones Technology of Innovation project. Using a recursive design process recommended for developers of children's software, ten new behavior tools with graphical interfaces providing visual models of behavior for primary-age children were developed and tested.

#### **Session Description**

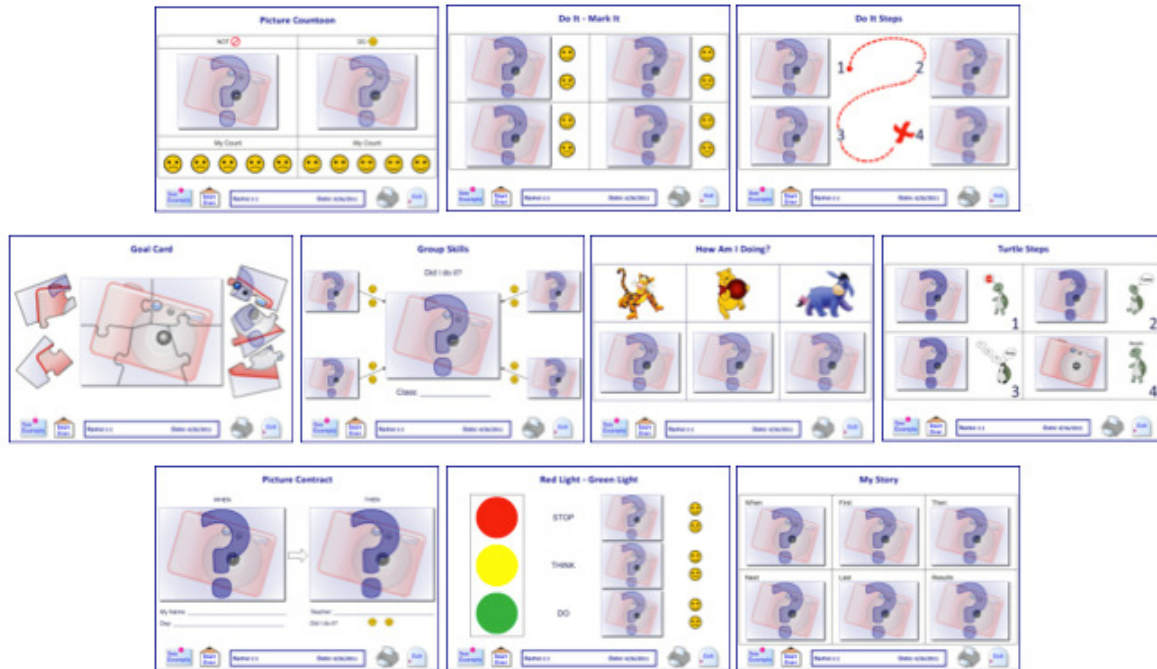
This session demonstrates an EPSS for young children, *PictureTools*, developed as part of a Steppingstones Technology of Innovation project. Ten new behavior tools with graphical interfaces for primary-age children in a program named *PictureTools* were developed and tested. *PictureTools* also contains a gallery of photos of children in typical school settings exhibiting a variety of behaviors that can be inserted into the tools as visual models of behavior for children; the photos reduce the need for written text in the tools. There is also the option to take and upload personalized photos of individual children in the classroom so teachers can integrate them into the EPSS.

Usability testing was undertaken with four students and two teachers. Students and teachers completed 92% of the steps independently on their second trials; had no difficulties with the interface; chose appropriate pictures; and were very positive about future tool use—except for one child who missed recess for the usability testing session.

Feasibility testing with four Kindergarten teachers in a low SES, inner city, diverse school district yielded positive results from teachers and students alike for ease of use, acceptability, and positive outcomes on children's behavior. Teachers used the tools with individual students and with groups of students to model and prompt appropriate social and task behaviors across situations. Findings suggested that teachers found the tools very practical and easy to use with individual students as well as with whole classes and reported that they were an excellent fit with the school's school-wide positive behavior support program. Teachers requested additional tools for social skills, bullying, and tattling. Ongoing development work is adding video modeling capabilities and tool use on mobile devices.

The ten tools are displayed in the following graphic. These tools are created on computers, printed, and used in classroom situations.

## PictureTools-at-a-Glance



### Supporting Literature

Challenging behavior is evident in even the youngest children served in special education. The NEILS study indicates that 10-40 % of children served in school classrooms have behavioral concerns (USDOE, 2001). Children with high incidence disabilities display a range of social deficits and challenging behaviors that often lead to isolation and peer rejection, and may lead to other more detrimental outcomes such as social failure and problems with learning, anxiety, depression, and substance abuse (Bellini, 2006; Fox & Smith, 2007). Interventions based on cognitive-behavioral approaches have been shown to improve social competence and behavior outcomes for students with a variety of different disabilities, and electronic performance support systems have potential to expand the flexibility, portability, and effectiveness of these interventions (Baker, Lang, & O'Reilly, 2009; Bellini & Akullian, 2007; Mitchem, Kight, Fitzgerald, Koury, 2007; Mitchem, Fitzgerald, Koury, Cepel, & Boonseng, 2009).

EPSS is a visual support system that may be helpful for many children with a wide range of developmental disabilities. Some of these children need to visualize positive consequences for appropriate behavior and often benefit from token systems. Other children need visual support for controlling behavior, and given such support, may select more appropriate, alternative behaviors. Social and behavioral competence in young children is of critical importance because this predicts their academic performance in the first grade over and above their cognitive skills and family backgrounds (Fox & Smith, 2007). With an increasing focus on academics in Kindergarten, this places those children who are unable to interact socially with peers and adults at risk for missing quality academic instructional time. Behavioral as well as cognitive-

behavioral strategies and social learning approaches may help these students to recognize cues, develop new responses, modify their thinking, and transfer these responses to new situations.

Self-regulation plays an important role in strategic performance. Research demonstrates positive effects on new learning as well as mastery and generalization from strategic self-regulation instruction (Reid, 1996). One group of EPSS tools to build self-regulation and use of learning strategies for students with mild EBD and/or LD is *KidTools* (Fitzgerald, Semrau & Young, 2000). A second EPSS software program, called *KidSkills* was developed to provide a system of organization tools and learning strategy tools (Fitzgerald & Koury, 2001-2002), and a related EPSS program for the secondary level, *StrategyTools* (Fitzgerald & Koury, 2004-2005). The latest EPSS software program to be developed is *PictureTools* designed for young, pre-reading children (Fitzgerald & Mitchem, 2008-2011).

The family of EPSS tool programs are designed to be “growable,” so children can move up or down the program levels depending on their needs, yet find consistency across all levels. These EPSS programs are accompanied by numerous parent and teacher supports and training materials. These parent and teacher infobase programs include explanations of the tools, examples, and tips for using the software tools successfully with students. Interactive websites for students and educators—called *Kid Coach* (<http://kidtools.org>) and *Strategy Coach* (<http://strategytools.org>)—provide descriptions, examples, practice simulations, and tool tips.

EPSS incorporate the principles of Universal Design for Learning (UDL) by providing multiple means of representation (text, images, audio), multiple means of acting on the information (anytime, anyplace, just-in-time scaffolding), and by addressing engagement of students through interaction, self-monitoring, and use of personalized visual media (CAST, 2011). EPSS systems have four basic components: 1) easily accessible information, 2) user guidance, 3) information/skills tutorials, and 4) tools to carry out the task (Gery, 1991). As more experience has been gained with the EPSS systems, tools have become more sophisticated and tutorials have incorporated multimedia instruction and contextualized practice (Gustafson, 2000; Wilson & Myers, 2000).

The software development process has been recursive, going through several phases of development, testing, and revision based on procedures recommended by designers of children’s software (Druin, 1999) and evaluators of interactive learning systems (Reeves & Hedberg, 2003; Shneiderman, 1998). The first formative evaluation phase—design testing—included three processes: 1) review of content and interface design by consumers or experts in children’s software design, 2) observations of adults working with the prototypes, and 3) in-house testing for functionality. The second formative evaluation phase—usability testing—included three steps: 4) observations of children using a sample of the tools while “thinking-aloud” (Smith & Wedman, 1988), 5) examining tool artifacts, and 6) interviewing usability testors. These six developmental steps lead to feasibility testing in classroom settings.

### **Relevance to Conference Theme and Audience**

Education/Instructional Pedagogies: Teachers of Young Children with Disabilities or Teacher Trainers in Higher Education

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