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Empowering Transitions for Youth With Cognitive Disabilities

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Family Experience Spurs Real-World Innovation

Tom Keating discusses assistive technology and computing to set the stage for the purposes of Picture Planner™, software that allows persons with developmental and cognitive disabilities to conceptualize and manage their own planning and scheduling:

The potential for [assistive technology] is huge, but of course you're speaking to a true believer. What computers do for all of us is augment our cognition in different ways. They give us the capacity to consume information in amounts we wouldn't otherwise be able to do. The irony is, of course, that these devices are the least accessible to people who have the greatest need for cognitive augmentation — people with disabilities. I think people with cognitive disabilities are pretty much last in line in terms of accessibility progress in this digital world.

Tom was sensitized by growing up with his brother James, who lives with autism. This spurred Tom's graduate work in special education and rehabilitation as well as early work in the 70's with "experimental programs the University of Oregon was developing to provide community living opportunities for people with really significant cognitive disabilities." An even stronger education ensued when James moved to Oregon and Tom assumed full responsibility for his daily living needs.

James had significant problems with planning in general and, Tom adds with retrospective humor, especially with budgeting: "James was a real 'shop till you drop' kind of guy, and wanted to spend lots of money he didn't have." Tom applied principles from his graduate work, but the paper and pencil process was too abstract, and Tom realized that it forced him to drive the process. This created unavoidable tensions, as many parents have discovered when attempting to tutor their own children. Tom believed he could establish a different relational dynamic in human-technology interaction, and concrete programming on an early spreadsheet proved successful for James to manage decrementing expenditures from an initial weekly amount:

*It provided a graphic hook for him to see how much money he was spending, and it totally transformed what we were doing in two ways. It made it **understandable** to him, and the other thing is that it was the*

computer telling him whether he had money left to spend or not rather than me. The computer became the ‘bad guy’. It’s been reiterated to me over and over that we would rather be told what to do by machines than other people, especially if you have some control over the machine that **you**, in turn, program or tell what to do. It turns out that’s really true about people in general and certainly people with disabilities with whom I have worked — you gain a lot by getting control over a machine.

Designing Picture Planner™

In creating Picture Planner™, “a visual calendaring program and personal organizer,” the primary principle was simplicity and transparency for maximum independence. Although the system can be operated by various input devices, Tom optimized the design for touch screens, which he has found is the most direct and clear way of interacting with technology for his target users.

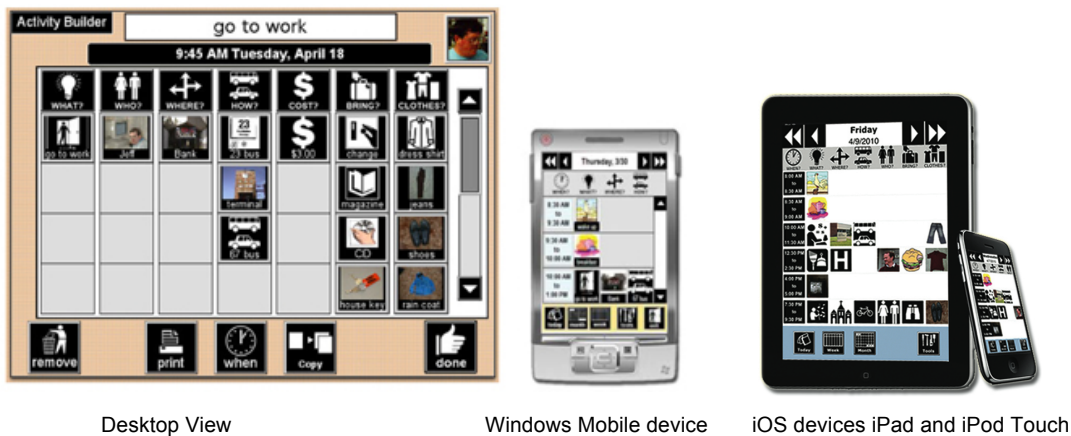


Figure 1: Picture Planner™ Desktop and Handheld Device Views

Further, he was aware that his users would be a “very heterogeneous group with no ‘one size fits all’ kind of solution,” so he also designed it with specific features to more easily allow family members, teachers, or attendants to be a part of the interaction at various stages as needed. He continues,

Figure 2: Activity Builder

Picture Planner™ users set up a schedule that they can then follow, either through a printed page or a handheld device and everything in the program is ‘tri-modal’ with a graphic image, a text label, and text-to-speech output, so that’s a huge accessibility avenue. The entire program is also single click without any need to double or right click. You can add images, photos, or symbols — whatever the user finds most meaningful — into the program. That’s huge because some people want to use personal pictures or prefer one symbol system over



[View Picture Planner™ Tutorials](#)

another to describe their activities. It's easier to just click on a picture of something and schedule it rather than typing in the text label and it takes less time.

The system allows users to [pictorially connect a time on a calendar grid](#), persons an activity will involve, what activities will occur and where. Users can even plan what clothes will be worn in what Tom calls a true “*task analytic approach.*”

Referring to the tandem design for users and assistants, Val Stilwell adds that transitions to new contexts and personnel is also built in, a key benefit in the educational environment for transferability:

It's easy for a new person to get into the program and see what's been done historically for an individual or a group and then be able to move forward from that point. This is technology development that meets the needs of not just the consumers, but also the people who need to teach it.

Tom believes persons with cognitive disabilities are capable of far more than our society has recognized, and that inclusion is essential to helping to breakdown the stereotyping and isolation they can experience. Picture Planner™ 3.0, with expected release in September 2010, adds the iPhone and iPad as usable platforms, as well as the capacity to sync Picture Planner™ schedules to Google calendar, allowing additional communication, social networking, and co-scheduling to occur. Future plans include potential connections with Facebook and Twitter.



“Picture Planner™ will help me remember so much. And I can add my medication times too,” said Eddie.

Eddie learning about Picture Planner™ reminders and prompts and how to reschedule and review the reminder elements.

Eddie creating an activity in Picture Planner™. Eddie's goals were to use his iPod Touch as his pocket reminder to remember to complete his tasks, take his medication, and remember his meetings

Validating Picture Planner™

Assistive technology conferences, which Val indicates are critical for marketing despite their start-up company status and the state of the economy, offer important feedback for a small company:

We're finding we have an opportunity to speak to groups and present what we're developing. The conferences are unique in that we can observe the intuitive tools Picture Planner™ provides. Elsewhere we can set up a demonstration, but for us to be able to see someone come up and just automatically start using it — because it makes sense to them — provides

the feedback that we're on the right track.

Through large-scale school district implementations, Tom is also pleasantly surprised to find that it has proven effective for various other aspects of community based skills instruction, including general task engagement, computer use training, and following sequential verbal instructions, all of which generalize as abilities for other learning activities.

Mobile Computing as a Game Changer

Cognitopia's design for Picture Planner™ accounts for the absolute importance of [teachers, family members, and assistants](#) in the incorporation of assistive technology into authentic daily use. In an interesting twist on the downside of their importance 'in the loop', Tom continues,

I hope we're a little ahead of the game here in some respects at Cognitopia, but I think a reason that [assistive technology] hasn't yet met its promise is that, in general, it can be too complicated. For example, anyone who has tried to program a complex augmentative communication (AAC) device understands why a number of those devices sit in closets. If you lose that one instructional aide or single person in your world who 'can do that', then all of a sudden the value goes down.

Tom believes that there is a positive, basic expectation for the development of accessible technologies that is a favorable driver, but also fears that unrealistic conceptions may also have been instilled, continuing,

To some extent [assistive technology] may have been overpromised, if you want my opinion. I think people see Stephen Hawking on TV and think if they get an AAC device they're going to be able to do what he does and be a great conversationalist, without realizing the best users in the world often can't use those devices at a real conversational level. It's a false promise, though by no means a malicious one, and there are any number of software applications that could be similarly critiqued. However the [assistive technology] field is relatively young and the devices and applications developed to date have limitations. Again, overall, the simpler the better – most people don't have access to technical support on a regular basis.

Val also adds that many critical personnel in the lives of youth with disabilities lack technical skills and awareness, indicating, *"One of the biggest challenges we see, and we spend a lot of time on this at conferences, is teaching the people who are going to assist the individuals that need help about what's available.* Tom concurs, adding that staff also suffer from not having time to set technology up and implement it without sufficient tech support.

Cognitopia is responding by building a range of tutorial types that, in addition to the transparency of their design, include a curriculum for how teachers and others can incorporate Picture Planner™ into basic daily organization, communication, planning for personnel turnover, and even meeting specific IEP goals.

Tom is ultimately optimistic, seeing relations and opportunities for unifying assistive technology design with the proliferation of portable and intuitively designed electronics:

Putting aside technology abandonment for a second, what's going on right now with mobile platforms is a real game changer. These are important

tools for educators with the low cost and availability of all the 'apps'. There's enormous power there that gives people a serious alternative to very expensive equipment.

Importance of Funding for Research

Cognitopia can proudly call itself a “research-based product,” having been developed in part through competitive grant funding by the OSEP Steppingstones Program. “We are enormously grateful for the support we’ve received from the Department of Education, which has played an important role in funding our work in cognitive accessibility,” Tom says. This designation is critical as a marketing lever with school district, which are mandated to purchase products and services that show a research base.