

***BI Capture*[™] in the Classroom:**

An easy-to-use video solution for behavior observation and analysis

(Including research results from a five month study)

I. OVERVIEW

Behavior Imaging Capture (BI Capture) is a new and effective tool that enables teachers to use video technology to record and review problem behavior events and, more importantly, what precedes these events. With an increasing number of children with special needs and disabilities entering the educational system, this unique *BI Capture* system empowers teachers and behavior professionals to analyze and correct problem behavior.

The *BI Capture* system, along with its accompanying software, will provide a platform for secure and comprehensive behavior analysis by professionals who seek to understand why a specific problem behavior event occurs. For the first time ever, they will be able to look back in time and review the antecedent of a behavior event that may disrupt the productive routine of a classroom.

The activation of the *BI Capture* system is as simple as pushing a button on a remote, wireless device much like an automatic car door opener. The teacher can then attend to the behavior event with the confidence that whatever preceded that event has been video captured, stored and may be shared for later review with behavior specialists, parents, or other interested parties.

The components of the *BI Capture* system have been specifically designed for ease-of-use and low profile installation. Early deployment and testing of the *BI Capture* technology has been met with enthusiastic acceptance, short learning curve and impressive results. Chief among these results is the reduction of teacher workload both directly and

indirectly in the completion of functional behavior assessments (FBA).

II. BI CAPTURE AND BETTER FBAs

Functional behavior assessments (FBAs) are reports that are often required from teachers to document the problem behavior of a specific child to facilitate the process of expert analysis and corrective steps. FBAs can be very effective if they are accurate, complete and consistent. However, even the most conscientious and observant teacher will encounter these three drawbacks to traditional 'pen and paper' FBAs:

- They rely on the teacher's direct observation of spontaneous, and sometimes fleeting, behavior events.
- They rely on the accurate recall of the event and the communication skills of the teacher writing the report.
- There is no way to determine exactly what caused the behavior event.

The specific detail leading up to a behavior event is even more essential, for corrective measures, than the event itself or the consequences of the event. The ability to capture the cause, and not just the effect, of disruptive problem behavior is resonating with teachers and behaviorists across the nation. Autism educators are especially interested in the ability to capture, store and view the trigger of behavior events. The potential of *BI Capture* includes other innovative applications in the health and special needs communities.

III. *BI CAPTURE COMPONENTS, INSTALLATION AND OPERATION*

There are three major components of the *BI Capture* system: (see figure 1)



Figure 1: The *BI Capture* system uses small cameras and remote control units to allow teachers to capture and store behavior events easily and unobtrusively.

- **The camera** can be any small, low-profile, unit, either corner ceiling-mounted unit, or as a web-based camera.
- **The remote control unit**, activates the system, is the size of an ordinary remote car door opener remote.
- **The proprietary software** which allows for annotation of behavior events, upon later review and analysis, also comes with an installation wizard for quick download and secure data sharing.

The video recording capabilities of the system are always on and available to capture a behavior event. However, it takes the direct action by the teacher to push the button on the remote unit to capture and store the event. This action automatically captures the video of the events prior to the button's press, the actual event that triggered system activation and, finally, the intervention and consequences of the event. The behavior event is now ready for review and annotation by the teacher, on her computer and at her convenience, by accessing the video through the *BI Capture* software. She can also share this remotely with a designated autism consultant or behaviorist, and the technology should facilitate the school's current policies regarding HIPAA and FERPA compliance.

BI Capture's proprietary software program is designed to allow the teacher to process and prepare the captured video for later review and analysis in two important ways:

- Video tagging and annotation for contextual consideration (see figure 2)
- Automatic graphing capabilities to support quick evaluation/ analysis by qualified experts (see figure 3)



Figure 2 : Video gallery allowing 'tagging', annotation, time stamping

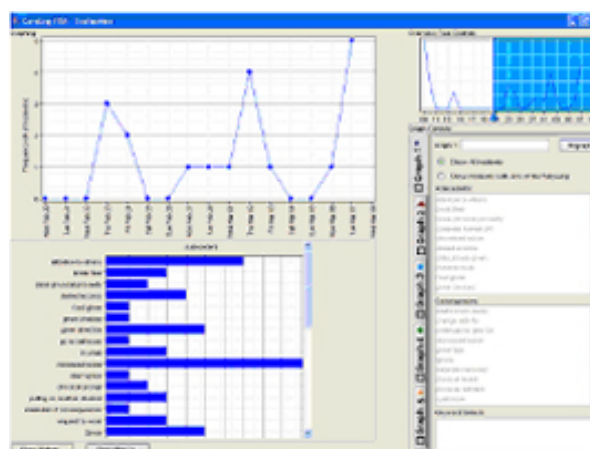


Figure 3: Automatic graphical capabilities (offered within BI Capture, and through 3rd party software solutions)

III. BI CAPTURE RESEARCHED IN THE CLASSROOM

A research study was conducted in a real school setting over a five month period with an early prototype that eventually became *BI Capture* (Hayes, 2007, Hayes, et al, 2007). All participants were teachers and students at a single school site for children with dual disabilities, autism and other severe emotional and behavior disorders. The researchers considered the success of the assessments, the efficiency of data collection, the cognitive, emotional, and physical workload perceived by the teachers, and the effect on teacher and staff experiences in their daily activities.

During this study, four teachers conducted FBAs for eight different students. Each teacher assessed one student using the traditional 'pen and paper' method and the other student using the prototype *BI Capture* system. The conditions were counterbalanced, with two teachers using *BI Capture* technologies first and the other two using 'pen and paper' first. Overall, 245 behavior events were used as part of their assessments, with an average of 30.6 events per student assessment (min=15, max=64). All of the assessments prepared by the teachers were experimentally verified using functional behavior analysis in a controlled setting. A variety of instruments were used to measure our assumptions regarding the technology's ability to augment and enhance behavior management practices (Hayes *et al*, 2007). considered the success of the assessments, the efficiency of data collection, the cognitive, emotional, and physical workload perceived by the teachers, and the effect on teacher and staff experiences in their daily activities.

Hayes *et al*. hypothesized that classroom staff could capture more incidents in less time with less stress by using the *BI Capture* system. FBAs, although valuable, are often not used in classroom settings because the workload on the part of the teacher (and sometimes the teacher's aides) is simply too high to regularly maintain and thoroughly analyze

records while performing at a high level in terms of instruction and classroom management. Over the five month period, the use of *BI Capture* technologies reduced the workload of classroom staff both *directly* in terms of their perceived load and *indirectly* in terms of redistribution of work in terms of time and staff. This improvement can be attributed to many factors. First, the technology itself inherently provides benefits such as automated organization of information and automatic graphing capabilities that support quick evaluations. The automatic graphing and calculations in particular were cited repeatedly by teachers as huge timesavers. Second, work could be redistributed to times more convenient for the teachers. Finally, due to the presence of simple-to-use *BI Capture* technology, the teachers were more likely to entrust other staff members to take data when they were out of the room.

One important aim of this study was to determine if technologies like *BI Capture* could result in fewer missed incidents by the staff, faster diagnoses, and less time spent in data recording and analysis. Use of the video capture technology in this study resulted in a significant 43.37% reduction of errors in recording incidents ($p= 0.0025$). In terms of time spent, the most time reported by the participants using the traditional pen and paper technique was simply doing the mathematical calculations. These calculations are performed automatically by the system resulting in significant time savings for classroom staff.

Teachers also reported some benefits of using *BI Capture*'s features to quality of life experiences in the classroom. Teachers reported that use of the captured videos allowed them greater access to the activities in their classrooms. They specifically commented that they were able to use the system to gather data even when they were not present. Finally, teachers commented about the ability to see what other students were doing during those times that they are

occupied with the students who were the targets of the assessments.

CONCLUSION

BI Capture technologies have the potential to transform current methods of documenting, analyzing and treating problem behavior in the classroom. Many education and clinical experts, who have become familiar with the *BI Capture* system, predict that using video-capture technology could soon become the standard method for behavior analysis. In fact, any application or caregiver environment that depends on behavior observation and assessment can greatly benefit from this unique and easy-to-use technology. These other potential applications include staff training, student assessment and common area monitoring.

Because of regulatory concerns, the *BI Capture* technology is designed to facilitate a school's strict adherence to HIPAA and FERPA regulations, while maintaining system flexibility and extensibility. Schools, healthcare facilities and families can confidently install the *BI Capture* system with the assurance of secure protection of video data communication and sharing.

Citations:

Hayes, G.R., Heflin, J., Abowd, G.D., Gardere, L.M., DeFazio, C., Pittman, C., Pirouz, N, and Hooda, S. *Evaluating a Selectively Archived Video Recording System for Functional Behavior Assessment in Schools*. Applied Behavior Analysis International - Autism (February, 2007, Boston, MA, USA), 2007.

Hayes, G.R. *Documenting and Understanding Everyday Activities through the Selective Archiving of Live Experiences*, Georgia Institute of Technology, August 2007

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