TEACHER TECHNOLOGY USAGE TO STUDY STUDENTS WITH AUTISM

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ABSTRACT

The Kellar Instructional Handheld data (KIHd) System is a real time data collection tool to collect instructional data on students diagnosed with autism. This study measured the reliability of the KIHd System and investigated the usability of the device among special education teachers. Using an ABCD design, the study period ran between January and December 2007 at a school that serves students with autism. Visual data analyses revealed an overall increase in the reliability of data collection device and data tracking showed an overall increase in the system's usability among teachers during the period. Study results have implications in furthering technology usage among teachers in special education settings and in enabling data-based decision making for students' development and overall academic achievement.

Introduction

Autism is a developmental disorder that begins at birth or within the first three years of life (Autism Research Institute, n.d.). For many years, autism was rare—occurring in just five children per 10,000 live births. However, since the early 1990s, the rate of autism has increased exponentially around the world with figures as high as 60 per 10,000 with boys outnumbering girls by four to one (Centers for Disease Control, 2007). In 2007, it was reported that in the coming years, 1 in every 150 children will be diagnosed with autism (CDC, 2007). Given the magnitude of children being diagnosed with this disorder and its implications on a child's educational needs, it is vital that instructional decisions are made to enable a child's development. Additionally, in an academic setting, it is critical that special education teachers/paraeducators understand the nature of the disorder and receive adequate training to collect student data accurately and efficiently to make data-driven intervention decisions.

Importance

Typically, data collection by special educators/paraeducators is accomplished by paper and pencil. This method is not only time consuming but also involves non-standardization of data sheets, which often leaves data uncharted. Adding to this issue is increased data tabulation errors leading to delayed or even incorrect instructional decisions. For the past four years, researchers at the Kellar Institute for Human DisAbilities (KIHd), George Mason University, Fairfax (VA), have been conducting rigorous research and testing to develop a handheld data collection tool to enable real time data collection on students with disabilities.

Since year 2006-08, the researchers have been implementing a U.S. Department of Education Steppingstones (CFDA 84.327A, STEPPINGSTONES OF TECHNOLOGY, INNOVATIONS FOR STUDENTS WITH DISABILITIES/H327A060031) grant to study the progress of teacher training and data collection using the system in a classroom setting. The purpose of this study was twofold: 1) to measure the reliability of the KIHd System; and 2) to investigate the usability of the device among special education teachers. More specifically, we discuss the development and validation of the fidelity criteria; measurement of the reliability of the device, and examination of the usability of the system by special education teachers over a 12-month period in a Washington,

DC metropolitan school where discrete trial teaching (DTT) is employed with students on the autism spectrum.

About KIHd System

The KIHd system is a database-driven, handheld-based data collection and analysis system. Its functionality is based on the principles of Discrete Trial Teaching (DTT) under the Applied Behavior Analysis (ABA) and precision teaching methodologies. All the data collection and storage processes in the system are secured to ensure complete privacy and integrity. Data samples are stored either on handheld devices (e.g., PDA) or on the main database with Internet or wireless connections. Data stored on the handheld devices is automatically synchronized once the network to the remote database is enabled.

The KIHd System is designed for multi-users in an education system. These include—data collectors such as researchers, teachers, instructors, parents and/or caregivers to collect discrete performance data on children with autism. The system enables teachers to use a more accurate comparison using statistical probability from random assignment data rather than relying solely on visual differences in paper- and- pencil graphs. For instance, the KIHd System's statistical data can show performance/improvement trend in a student's learning that may/ not be easily discernable on a paper-pencil graph.

How the system works

The KIHd System consists of two platforms, a Personal Digital Assistant (PDA) and a Personal Computer (PC). When data are collected using the PDA, teachers/parents can see the interactive graph immediately. Additionally, its printable graphs can be observed on the PC for documentation of the student's progress. It provides the technology to have one touch based data collection and an immediate data analysis for teachers and parents. The KIHd System makes users (data collectors) and researchers collaborative in their data collection and analysis functions.

The KIHd system can be configured in several ways to meet different needs:

- Enterprise Edition – centralized system with one main database and several different data collection tasks. Example: A data analysis service provider or a school district.
- Corporate Edition – localized system that the administrators are able to manage data themselves over a local area network (LAN). Example: A school with local servers and data that solely belong to the school.
- Personal Edition – a user can perform data collection on the PDA and analyze the data on his/her own computer with Active Sync, Bluetooth, or other wireless connections.

The database for enterprise edition is based on the SQL server. Data from all applications is sent to the main database either in real-time or on sync. The corporate edition is also on the SQL server database. Data collected is sent to the database via LAN. The personal copy can be configured on either Access or SQL server databases. The system uses a XML-based Portal Dataset® and web services to enhance data protection and security.

The KIHd System has several advantages over the conventional paper-pencil method. First, the KIHd system collects real time data using the data types of frequency, accuracy, duration, and fluency; secondly, it instantly charts the data so that the data collectors can see the student's performance in a particular task or an observable behavior. Additionally, the

simultaneous use of the device by teachers and/or researchers promotes inter-rater reliability thus verifying a student's progress over time. The collected data and the graph provide evidence of consistent and reliable intervention that can be utilized for accurate and timely documentation of student's progress, promoting evidence-based practices and accountability. Furthermore, parents can also use the system with some training to enter information about their child's behavior at home so that teachers and therapists can have a more complete picture of the child's developmental and learning process outside the school environment.

Related to the study, the research questions were:

1) To what extent is the fidelity criteria developed for the study serving its purpose?
2) What is the difference in the levels of reliability of the device before and after teacher trainings?
3) To what extent is the level of usability (e.g., number of visitations to the program website, average time spent on the website, and number of pages visited per person) among teachers since using the device in the past year?

Literature Review

Discussion below reviews available literature on the issues of fidelity and reliability constructs. Additionally, this review provides background information necessary to provide a complete understanding of the rationale for the study.

Fidelity

Fidelity criteria, which are often used as manipulation checks in treatment effectiveness research, are necessary to ensure internal and external validity of an intervention (Hohmann & Shear, 2002). An often cited reason for assessing fidelity is to account for negative or ambiguous findings (Hohmann & Shear, 2002). Fidelity checks have been found to assist in documenting if a program is adhering to an intended model and also to check if there are any outcomes that reflect a discrepancy of the model (Chen, 1990). There is research evidence to show that failure to use fidelity checks can lead to inconsistent findings in replication studies, mainly in the area of psychotherapy (Bonds, et al 2000). In special education settings, it is even more important to use fidelity criteria to promote study quality.

In situations where experimental settings are not a viable option, such as program evaluations in health, education, and human services, fidelity checks help to provide relevance to evidence-based practices (Mowbray et al., 2003) and service delivery (Unrau, 2001). This extends to special education where it is not always possible to conduct experimental design with students. Thus, establishing fidelity criteria and being able to measure adherence enable interventions to be more standardized, consistently researched, and replicated (Mowbray et al., 2003). This ensures that the program is being implemented as proposed and facilitates progress monitoring to enable quality (Bond, et al., 2000).

Some of the ways in which fidelity can be quantified for comparison in clinical or programmatic interventions include: 1) scales, 2) semi-structured interviews with program staff who implement the program/intervention (Becker et al., 2001; Bond et al., 1997); 3) live or recorded sessions that are rated by supervisor or research staff (Clarke, 1998); 4) document

reviews and staff logs (Hernandez et al., 2001; Teague et al., 1995); 5) surveys (mail/telephone) to assess program implementation (Macias et al., 2001); 6) on-site observations of team, meetings and review of case files (Malysiak et al., 1996); 7) researcher developed checklists, or write-ups (Mills & Ragan, 2000); 8) reports from participants that received services or interventions (Orwin, 2000); 9) external reviewers; (Paulson et al., 2002) and 10) daily activity checklists (Umrau et al., 2001).

This study used a paper-based checklist developed by the study directors and principal investigators which were used by the researchers each time visited the school site to collect reliability data, record study-related activities, technical issues, if any, during the period, and notes on trouble-shooting. The checklists were collected at the end of each month by the study director to ensure consistency in study implementation and overall quality control. The fidelity checklist is attached in Appendix A.

Reliability

In measurement theory, lack of agreement among raters or instability within raters constitute an "error," where error refers to that part of the test takers' scores which deviates from the "true" score (Alberto & Troutman, 2006; Baer, 1977; Johnston & Pennypacker, 1993; Shohamy, Gordon, & Kraemer, 1992; Sidman, 1960; McMillan & Schumacher, 2006). Contributing factors to error in measurement are inadequate teacher/rater training, and erroneous rating scale (Shohamy, Gordon, & Kraemer, 1992). Information about the effects that these components have on rater reliability is vital because it indicates the accuracy of the test takers' scores, and reliability of the device used, thus assisting decision makers in selecting reliable raters and data collection tools in a cost-effective manner.

Kazdin (1977) suggested that there are sources of bias that can even influence interobserver agreement and affect the overall reliability of the study: reactivity, observer drift, complexity, and expectancy. Reactivity occurs when the presence of a researcher affects the behavior of both the students and of the teacher. Knowing another person is present to collect reliability data can increase the reliability of the data collection by 20 to 25%. Kazdin suggests that reactivity can be kept in check if reliability checks are done in an unobtrusive or covert manner or if the second observer collected data on several students including the target student, or that s/he were more familiar with the student or the paraprofessional who may influence the reliability otherwise. Observer drift occurs when observers/researchers change the stringency of applying the operational definitions; for instance, an observer may begin to record as "instances" behaviors that do no exactly conform to the operational definition. This can be avoided by referring to the definitions in use periodically. Complexity refers to how many types of behaviors or students are being observed at a given time that increases the level of details in a short period of time. Finally, expectancy refers to observers' pre-existing notions about students based on their past experiences with them or on information from parents and/or other sources. Furthermore, biases due to students' gender, race, appearance, or previous history may also affect reliability of data collection.

Relatively few studies have examined methods of training staff to implement DTT (e.g., Koegel, Russo, & Rincover, 1997; Sarokoff & Sturmey, 2004), although behavioral skills training packages have been used to teach and modify a range of behavioral and other skills such as implementing functional analyses (e.g., Iwata et al., 2000; Petscher & Bailey, 2006), stimulus preference assessments (e.g., Lavie & Sturmey, 2002) and analyzing visual data using dual-

criteria (DC) method (Fisher, Kelley, & Lomas, 2003). One study measured the effects of raters' professional background and training on their ability to assess written proficiency (Shohamy, Gordon, & Kraemer, 1992).

In general, findings from these studies have indicated that through training, careful planning, implementation and constant feedback, several aspects of reliability biasness can be minimized and behavioral technology can be taught to non-specialist staff (Iwata et al, 2000; Lavie & Sturmey, 2002). Research evidence also shows that technology training has enabled staff to perform specific tasks such as paired-stimulus preference assessments with children (Lavie & Sturmey, 2002), functional analysis (Petscher & Bailey, 2006), and interpretation of visual data (Fisher, Kelley, & Lomas, 2003).

Using assessment procedures correctly and reliably are paramount to successful to implementing behavior-modification procedures. Findings have increasingly suggested that when teachers do not use the training procedures correctly, efforts to teach and modify children's behavior have produced no measurable change (Koegel, Russo, & Rincover, 1977). Furthermore, clear instructions, constant feedback, rehearsal, and modeling helped increase teachers' performance in implementing discreet trial teaching (Sarakoff & Sturmey, 2004) and increased the inter-rate reliability from 43% pre-training to 99% post-training (Sarakoff & Sturmey, 2004).

The current study examined if teacher training on the use of the KIHd System and the hand held device can increase the accuracy rates of data collection to decrease the error rates in measurement. Additionally, the study investigated if training enabled the teachers to use the KIHd System more frequently.

Method

This study employed a single subject research methodology to examine the technology reliability and usage at a school that serves students with autism. This study also included data from other sources such as Click Tracking to record data usage (e.g., number of visitations, time spent, and number of pages viewed).

Setting and Materials

Data on reliability and usability were collected from January- December 2007 over a 25-weeks period at a school that specializes in serving students on the autism spectrum. Usability data using a click tracking system were collected at the end of each month by the researchers. A fidelity checklist was used each time researchers went to the site to collect data. The site was visited three times a week. There were fewer site visits during the months of June- August when the school was closed due to summer vacation or the days when staff training or other meetings were held at the school. A copy of the fidelity sheet is in Appendix A.

The study employed an ABCDE design. The baselines phase (A) included data collection by teachers using paper and pencil before the training sessions. The next session (B) was when teachers and researchers collected data after the first training session was completed using the device. C and D were training sessions 2 and 3 followed by maintenance (E). Accuracy was calculated as a percentage as the number of correct divided by number of data points multiplied by 100. A total of three- fifteen minute training sessions were conducted for three weeks during the study period. The first training focused on the data collected with the KIHd System. The second session highlighted the process of data entry. The last week discussed the data analysis

process using the graphing tool. Ongoing feedback on data collection procedures and graph interpretation was provided by researchers and when needed by the teachers. The study supervisor was in contact with school staff on a monthly basis to gather overall feedback on the trainings and study implementation. Correspondence took place via emails, phones and occasional in-person meetings on site.

During each data collection session, there was one researcher, and a note taker. Data were collected on each student task at a time, and any other secondary behavior/s of the student was noted in the KIHd system. A fidelity checklist was used each time (three times a week) a researcher visited the site for data collection. The fidelity sheet ensured that data were collected as planned and that no procedural changes were made during the data collection period.

A training document was prepared by the KIHd researchers. This document provided a step-by-step approach to collecting data at the school site using a secure username and password unique to each teacher/user. A copy of the training document is presented in Appendix B.

Data were collected from various sources. The sources included: 1) fidelity checklist; 2) reliability data collected by two researchers; 3) usability data—number of visitors per month, average time spent on the site; and page views per visitor. The fidelity checklist was completed on each site visit. It consisted of questions related to the type of data being collected; number of correct and incorrect recordings during the session, nature of technical help required by the teacher/s during the session and how it was resolved by the researchers on/off site. Data from fidelity sheets were aggregated at the end of the data collection period. The fidelity checklist ensured that there were no procedural changes made during each site visit and the data collection process was being followed as planned by the study researchers. The study supervisor, based at the university, collected the fidelity sheets on a monthly basis to ensure consistency and quality of data collection process.

Participants

Eight teachers and three students participated in the study during the study period. They were in the age range of 25-29. They had an average of 4 years of experience as special education teachers in the current school. A majority of them were White/Caucasians (6), one of them was African American and one Asian Indian. All the students were Caucasians, in the age range of 10-12 years. They were all diagnosed with autism. They were selected on the basis of their scores on The Childhood Autism Rating Scale (CARS), and Vineland scales by their head teachers and two other teachers at the school which was confirmed by the researcher using the tests.

There were two study researchers who alternated their site visits over the week; accompanied by a student researcher who took notes by hand at all occasions. The study researchers, principal investigator and co-principal investigator of the study had advanced degrees in education and were a part of the KIHd system since the inception of the research grant to the department. The student researcher was a master's level graduate who had extensive training in ABA and teaching students with special needs. The student researcher received a full day's training on how to use the PDA before going to the school site. Additionally, the two study researchers visited the school before the pilot test to acclimate themselves with the school environment, teachers and the students. This process helped reduce researcher reactivity. They also became a 'part' of the regular school day, which allowed the teachers to go about their day-

to-day instruction without hindrance from an 'outsider observer.' More importantly, the students became more comfortable seeing the researchers on a regular basis during the pilot study period.

Data were collected on each student task at a time and any other secondary behavior/s of the student was also noted in the KIHd system. A fidelity checklist was used each time (three times a week). The fidelity sheet ensured that data were collected as planned and that no procedural changes were made during the data collection period.

Data Analysis

Data from the fidelity sheets related to the number of times the teachers viewed the graph and needed any technical assistance during the data collection period were aggregated at the end of each month and examined over the 12-month period. Additionally, reliability and usability data are presented for the study period.

Fidelity

There was an increase in the number of times the teachers looked at the graph (Figure 1), between January and April, followed by a decrease from May to August, and again an increase in the months of October and December. There was a decrease in the number of times teachers viewed the graph in the month of November. Technical assistance held steady under 50% throughout the study period. The average decrease during the months of April, June, August and November was under 5%. The double lines indicate the site moving from collecting back-up paper-pencil data to relying solely in the KIHd System technology and graphs.

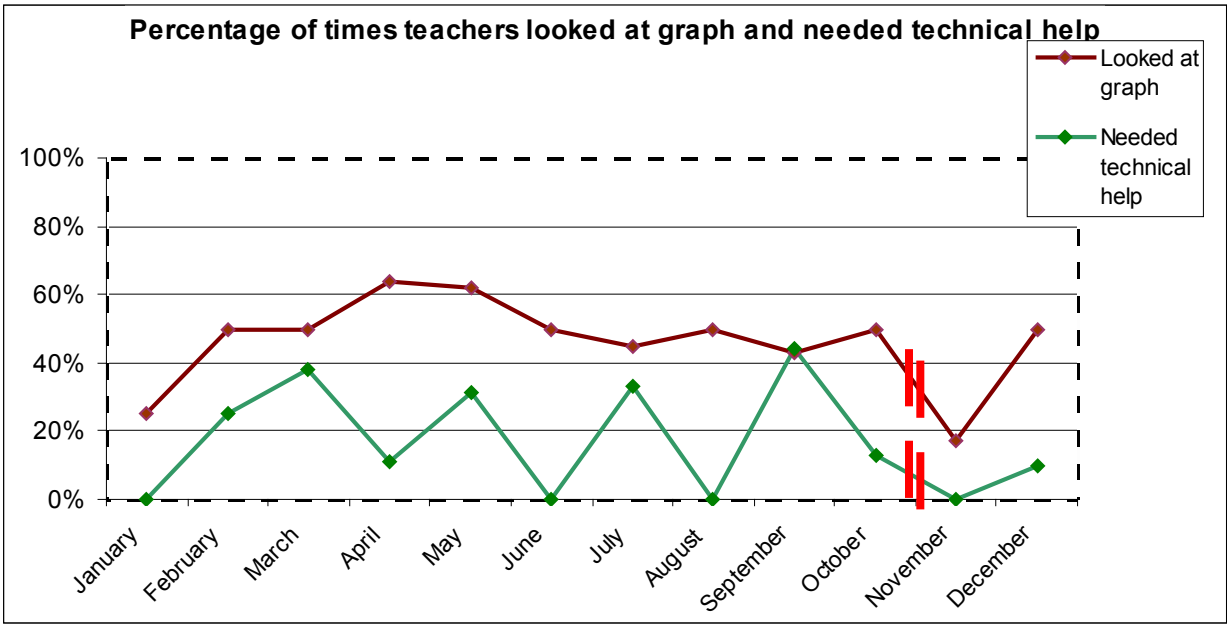

Figure 1: Fidelity of data collection

Reliability

Results indicated that the three training sessions with the teachers helped to increase the reliability of the data collection process. This was confirmed by the visual analysis of the averaged scores of the reliability data. During baseline (BL), data were collected using paper and pencil methods with no use of technology. Then, data were collected after providing training (TS1, weeks 5-7) using the technology. There was little to no consensus on what they considered as a 'correct' or an 'incorrect' response. The reliability ranged between 33% and 60%. After training session 2 (TS 2, weeks 7-15), there was an increase in the accuracy rates, which ranged between 78% and 100%. Lastly, training session 3 (TS 3, weeks 15-21), yielded a tremendous increase in the accuracy rates which ranged between 92 and 100%. Finally, the data collection sessions in the maintenance phase showed a relatively steady accuracy rate between 97 and 100% (weeks 21-25). See Figure 1.

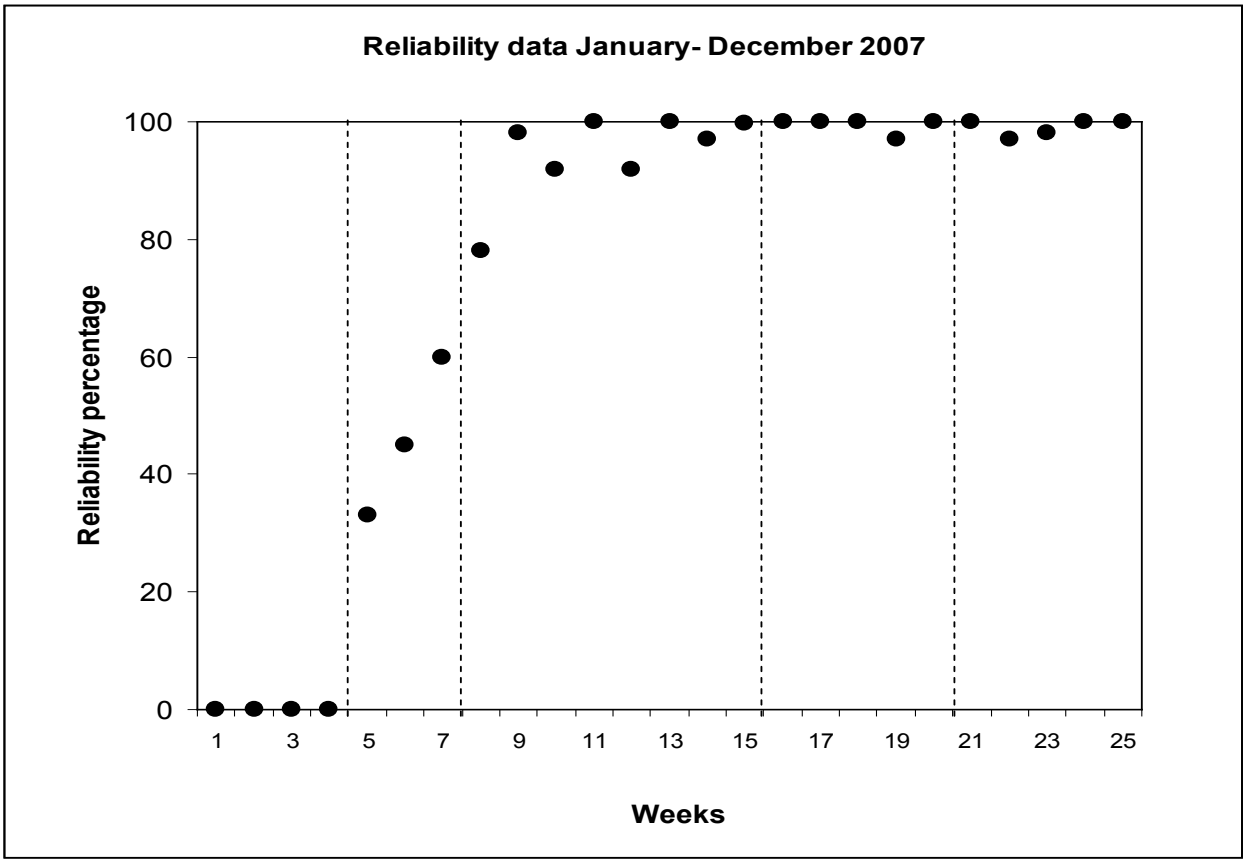

Figure 1: Reliability of data collection

Usability

Usability of the KIHd System by various users was tracked monthly through a software program called Click Tracking (www.clicktracking.com). This software has the capability to analyze not only the data, but also the users' behaviors through the web interface. All data entries

through web interface is logged including user IP, number of visits to the site, average time spent, and number of pages viewed.

As indicated from figure 2, traffic to the KIHd system ranged from 22 to107 visits in the span of 12-months. On an average the number of visitations to the system was 66 visits. There was a decrease in the number of visits during the month of June.

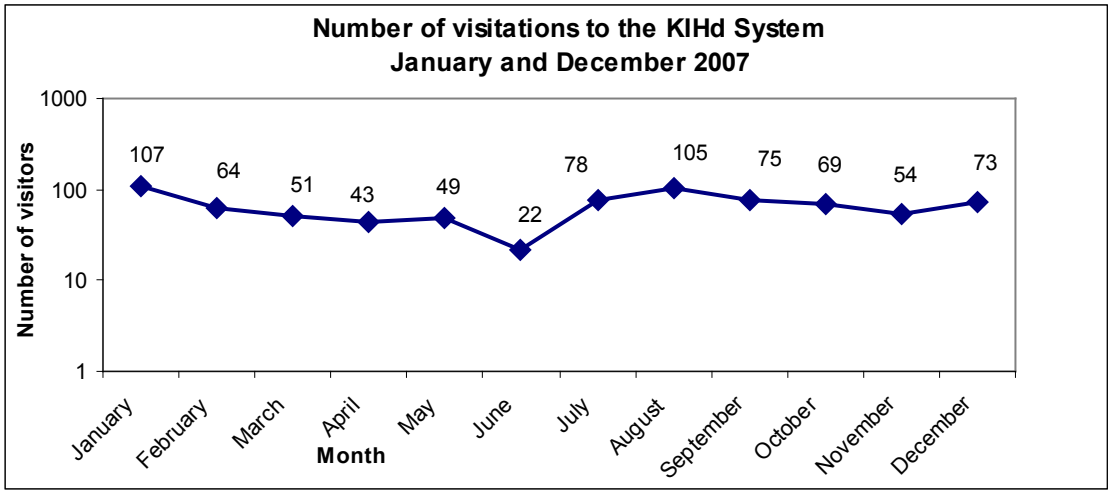

Figure 2: Number of visitations to the KIHd System

The click track system recorded the time spent on the site by the visitors during the period January to December 2007. On an average, 6 minutes were spent on site. The peak periods were during the months of August and November.

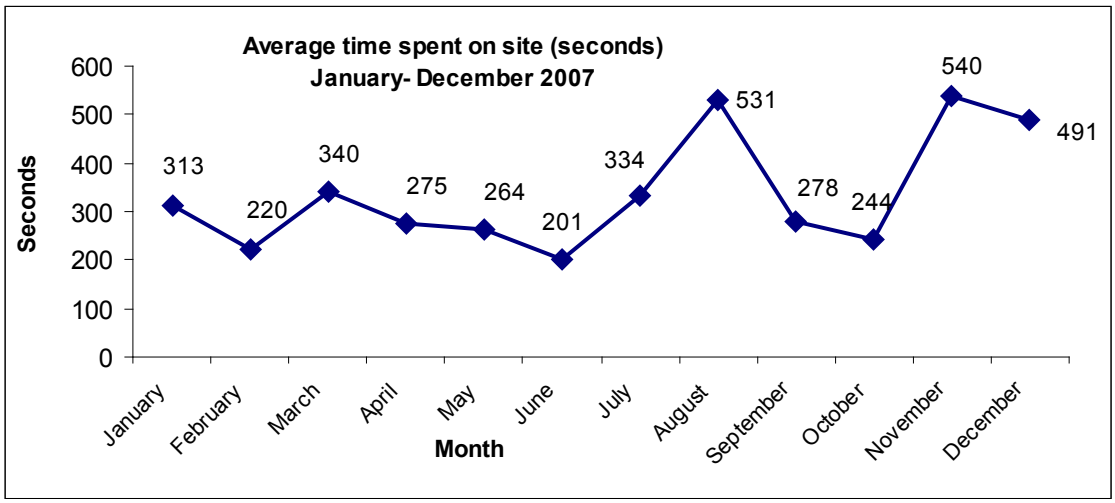

Figure 3: Average time spent on site (seconds)

Finally, the average number of pages viewed for the entire study period was 12. It ranged

from 7.6 to 17 pages. The high month being October and the low month being March 2007. The number of pages viewed remained almost constant during the months of April to July.

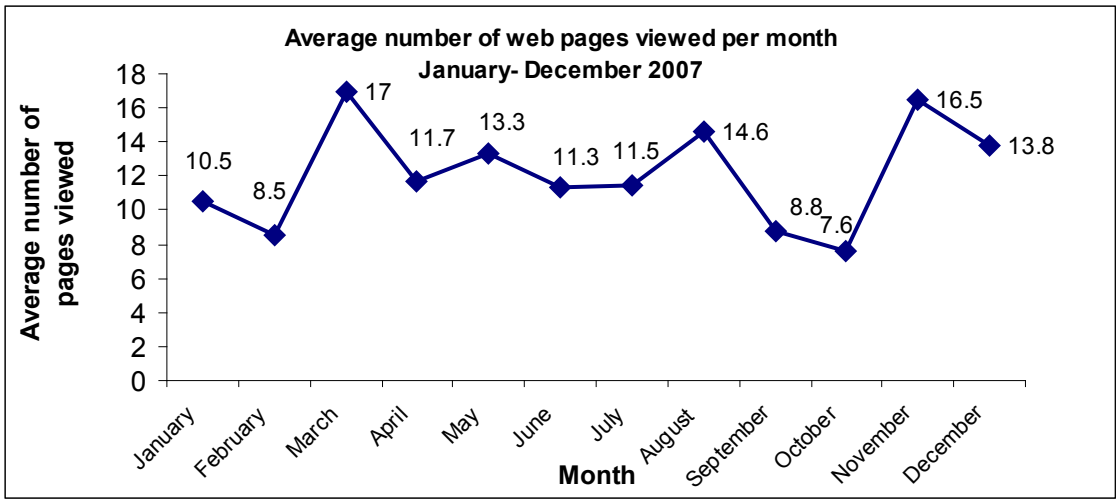

Figure 4: Average number of pages viewed per viewer per month

DISCUSSION

Autism Spectrum Disorders (ASD) is the clinical term for specific pervasive developmental disorders (PDD) that have a substantial and functionally restrictive effect on the individual and their family, in particular with regard to social interaction and communication. Autism is the fastest-growing developmental disability with a 10-17% annual growth rate. At this rate, it is estimated that its prevalence could reach 4 million Americans in the next decade (CDC, 2007).

An issue which has demanded significant public attention and is a point of considerable debate is that how parents of children with autism access special education for their children and how teachers and public education at large respond to best meet the instructional needs of the increasing number of students diagnosed with autism. Specially, for students with autism, teachers are required to keep careful records of their daily progress in order to provide adequate instruction. Therefore, data collection and the subsequent visual analysis of the data are critical for teachers who provide intervention to students with autism. Some schools collect the data, yet do not chart the information. This often happens because the current practice of using graph paper and pencil is cumbersome, and time consuming that often times leads to calculation errors. Additionally, some other schools demand that their teacher complete this rigorous task of hand charting daily, resulting in lesser time for classroom preparation and instruction.

The current study measured the fidelity of the study, reliability of the KIHd System and investigated the usability of the device among special education teachers. The KIHd system is based upon the principles of DTT under the Applied Behavior Analysis (ABA) and precision

teaching methodologies which are documented to be effective for students with autism. Given the magnitude of the problem, technological applications such as the KIHd System provide the tools necessary for data collection and analysis quickly and accurately.

Some issues of biasness that could affect the overall results were taken into careful consideration during the planning process of the study. First, study researchers acclimated themselves with the school, teachers and the students by observing for several weeks before the study began. This process allowed the students to behave in their typical manner when data collection began. The probability that the researcher/s and the teachers had pre-conceived notions of the students was minimized by the change in their tasks/activities being performed on a rotation basis. Reliability of data collection was ensured The school site chosen for the study had not used any technology to collect data prior to the study. Also, the teachers who participated in the study noted that it was their first experience using the hand-held device to collect any data. Although, they were technology savvy and had their personal PDAs. This ensured data accuracy for the study.

Visual analysis of reliability data clearly indicated that teacher trainings increased the reliability of the system. Data from the usability graphs indicated an uneven trend. The main reason for the trend, especially in the months of May through August, could be due to school closures in summer.

Certain study limitations are recognized. There were school-based and university-based server related problems throughout the study period which accentuated the situation at the classroom level. Data collection activities were either suspended or postponed during these periods. In spite of technological glitches, it is anticipated that as the teachers get more comfortable using the system, the amount of time spent on learning to the system and troubleshooting will gradually decrease. It is also expected that teachers will visit the KIHd System more often as they get comfortable using the device during the school year.

Relatively few studies have examined methods of training staff to implement DTT, although behavioral skills training packages have been used to teach a wide variety of behavioral and other skills. This study attempted to fill this gap by demonstrating that training can increase the accuracy rates of data collection tremendously and decrease the error rates in measurement. Additionally, the KIHd System enabled real time data collection using the data types of accuracy and instantly charted the data. The KIHd interactive graph provided evidence of consistent reliable intervention and the system's print graphs was used for documentation of student's progress, promoting evidence-based practices and accountability. Over time, multiple users can take advantage of the technology to save time and effort in recording and graphing their data accurately and eliminate the paper-and-pencil method completely. The results of the study have provided new ways to think about the amount and type of training support needed to sustain technology usage at a classroom level and quick and accurate data collection on students with autism.

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Appendix A

Fidelity checklist

Researcher's name_____ Room no. _____ Date _____Time _____

Instructor/s name/s_____ Student/s name/s _____

Target ☐ Phase ☐ Program ☐

Accuracy Frequency Duration Fluency

Number of correct ☐ Number of incorrect ☐ Percentage, If known ☐

Instructor/s looked at graph Y N

Technical help requested Y N Number of times ☐ Duration ☐

Reason for technical help _____

_____

Any decision/s made during technical help Y N

Explain _____

Secondary behavior observed/tracked Y N

Appendix B

1. Go to http://kids01.gmu.edu

2. Database: STEPSTONE (default)

3. Put Password - Trainer(s) will tell you what the password is.

How To collect Data

1. Click the "**Data Collection**" tab

2. Find your name, then click "**Login**"

3. Select **Student**

   A. For practice, you need to select "Student1".
   B. For real trial, select your student who you are working on.

4. Select **Target**, then click **Continue**

5. Make sure you are in the right place.

   A. If you find error, click **Back** button **in Internet Explorer**.
   B. If it is ok, click **Continue**.

6. Choose Phase

   A. View Chart – First, you need to initiate the session in order to view chart correctly. In order to initiate the session, click **Start Session**, then click **Cancel**. Then click **View Chart**. You will need to view the chart again after your session is completed. Click "**Back to data collection**"

   B. To start to collect data, click "**Start Session**"
      1. Y – Correct
      2. N – Incorrect
      3. When you make a mistake, simply click **Back** button in **Internet Explorer**.
      4. When you want to start session all over again, click "**cancel**" button, then click "**Start Session**" again.

   C. When finishing data collection, click "**End Session**"

7. **View Chart** again to see what you just collected. Then click "**Back to data collection**"

8. Make sure you end the KIHd system (**End data sample** > **Log Out** > **Exit**)

IMPORTANT: Make sure you connect PDA to the charger after you use

To define targets, add students/parameters, view graphs and/or reports

Click the "**Administration**" tab

The **Administration page** can bring you to pages that define targets/tasks, add a child, add parameters, view graphs and/or reports. Furthermore, Help may be selected to view the video and manual or you may press **Exit** to leave the system.

1. To define targets, click "**Define Targets**" in Administration page

The **Add New Targets page** selects the target name and selects data that defines your target from the drop down menus. Additionally, prompts and datatype are selected from this page. **Prompts** are checked or novel prompts are typed in under **Optional Prompt**s. **Datatype** is selected from the drop down menu with the choice of frequency, fluency, duration or accuracy.

When you put all the information about the target, click "**Add Target**" button.

Current targets may be edited; their files can be made active or inactive.
To edit current targets, click "**Edit**" button

2. To add students, click "**Add A Student**" in Administration page

On the **Add Students page**, subjects and associated secondary behaviors may be added. Secondary behaviors can be collected with the datatype of frequency or duration.

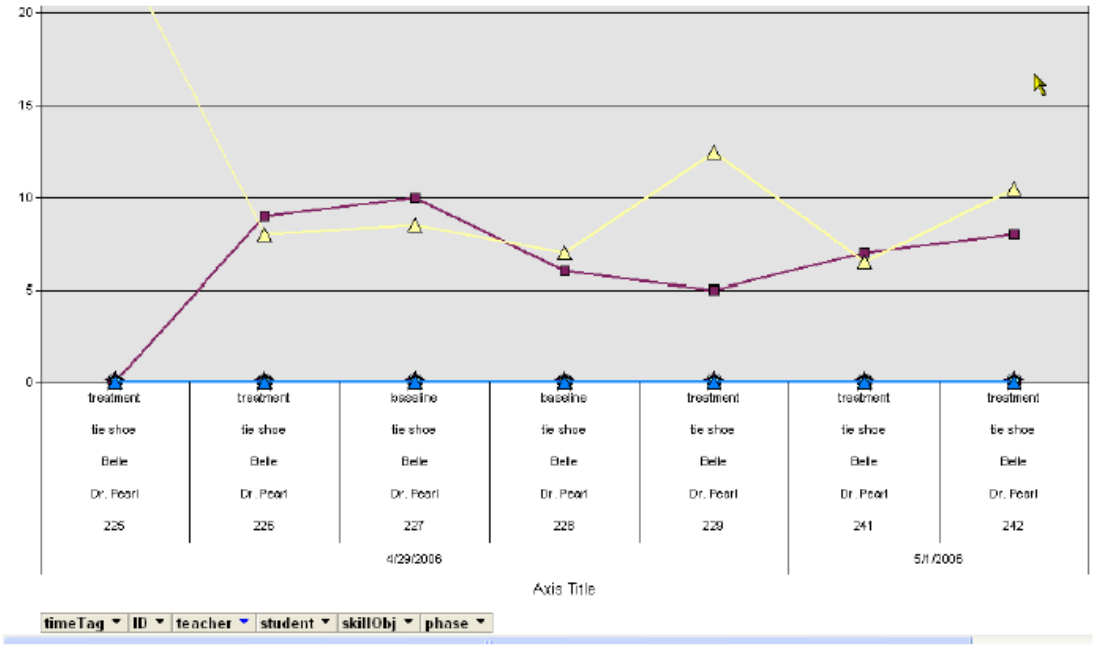
When you put all the information about the student, click "**Add Student**" button.

Current students may be edited; their files can be made active or inactive.
To edit current students, click "Edit" button

3. To add parameters such as teachers, skill areas, programs and content areas, etc., click "**Add Parameters**" in Administration page

View Graphs, Reports

The interactive **Graph** can be created by limiting the data from the drop-up menus of teachers, students, skill objective, or phase. In fact, one student can be viewed across many teachers or one teacher across many students.



Reports can be generated to reflect various sessions and anecdotal information.