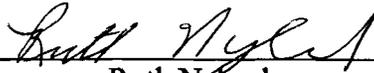Increasing Participation of Students with Special Needs

with an Interactive Whiteboard:

A Grant Proposal

by

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A Grant Proposal Project Report
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ABSTRACT

There are a growing number of students with special needs in general education

classrooms. These students often require additional resources to help them achieve

academic goals. Technology is a tool general education teachers can utilize to help all

students achieve their full potential. Learning can be enhanced through increased

engagement using an interactive whiteboard as an assistive technology device. Research

has shown the potential benefits of an interactive whiteboard for all students and

specifically for students with special needs. One noted benefit of an interactive

whiteboard is increased engagement due to the interactive nature of the technology.

Increased engagement is a leading factor in student participation. The focus of this paper

is to research increased participation of students with special needs through the use of an

interactive whiteboard. A submitted grant proposal would assist in the implementation of

an interactive whiteboard in an inclusive kindergarten classroom. The components of an

IWB system would address individual needs and promises improved educational results.

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I would like to thank my friends and family for the support they have offered. I especially want to extend my sincere gratitude to my husband and children who have supported me through this process.

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Chapter 1: Introduction

The Education for All Handicapped Children Act (P.L. 94-142) was enacted in 1975 to ensure students with disabilities had the same opportunity as other children to receive a free appropriate public education. The bill was renamed the Individuals with Disabilities Education Act (IDEA) in 1991. Since the inception of these acts, students with disabilities have gone from placement in residential homes to placement in the general education classroom depending on the severity of their disability. Students are to be placed in the least restrictive environment and an Individualized Education Program (IEP) implemented for each child with a disability. Recent updates to IDEA (2004) state research and experience has shown that the education of children with disabilities can be made more effective by having high expectations for children with disabilities and ensuring their access to the general education curriculum in the regular classroom, to the maximum extent possible. The inclusion of children with disabilities makes it essential for regular classroom teachers to meet the needs of a wide disparity of students.

Regular classroom teachers also include English Language Learners (ELLs) in the heterogeneous classroom. It is important to note that ELLs are not considered disabled unless identified as such according to IDEA. However, ELLs are students who have special needs in the regular classroom as recognized by the Wisconsin Department of Public Instruction. According to the U.S. Department of Education Office for Civil Rights, there has been a surge of immigrants with limited English language skills in recent years. These limited English language skills affect the student's ability to participate effectively in educational programs (2000). IDEA 2004 states that the Federal Government must be responsive to the rising needs of an increasingly diverse society.

Teachers are challenged to give specialized assistance to students with an IEP as well as to continue to provide the level of instruction necessary to meet the needs of those without disabilities. Alfred Basilicato restated the message put forth by Julie Wood, "Creative possibilities exist when instructional tools are adapted to meet the unique learning styles of students, permitting knowledge to be shared by all. Technology enables students to engage with subject materials in a way that focuses on their individual strengths" (as cited in Basilicato, 2005, p. 1). Technology is a tool general education teachers can utilize to help all students achieve their full potential.

Statement of the Problem

Increasing Participation of Students with Special Needs through the use of an Interactive Whiteboard. There are a growing number of students with special needs in general education classrooms. These students often require additional resources to help them achieve academic goals. IDEA requires school districts to provide a free and appropriate public education to students with a disability regardless of the nature or severity. The revisions made to IDEA in 1991 and 2004, broadened the definition of disabilities and added related services. The new definitions increased the amount of students with disabilities in the regular classroom. IDEA (2004) defines a child with a disability (Public Law 108-446, 118 Stat. 2652).

> The term 'child with a disability' means a child with mental retardation, hearing impairments (including deafness), speech or language impairments, visual impairments (including blindness), serious emotional disturbance (referred to in this title as 'emotional disturbance'), orthopedic impairments, autism, traumatic brain injury, other health impairments, or specific learning disabilities; and who, by

reason thereof, needs special education and related services. (p. 6)

A child aged 3 through 9 may also be "experiencing developmental delays, as defined by the State and as measured by appropriate diagnostic instruments and procedures, in one or more of the following areas: physical development; cognitive development; communication development; social or emotional development; or adaptive development" (IDEA, 2004). For the purposes of this paper, I will make reference to students with special needs to include English Language Learners (ELL) as students with special needs.

The U.S. Department of Education Office of Civil Rights does not require a school district to use a particular educational approach for the instruction of ELL students. Districts have flexibility when developing programs to meet the needs of ELL students (2005). The Medford Area School District had 45 ELL students enrolled in 2006-2007. The number has fluctuated during the 2007-2008 school year with a peak of 47 students. The National Association of Elementary School Principals (NAESP) offers recommendations for the Reauthorization of the Elementary and Secondary Education Act (1965), the latest version of which is the No Child Left Behind Act of 2002. NAESP suggests the guiding rationale for ELL students is to help them learn to understand, speak, and write in English with the support of adequate funds and other resources. Administrators and educators face the task of meeting the needs of all students especially those with special needs, which is proving more difficult as the range of needs increases.

The State Education Data Center (2006) reports that nationwide there are 13.6 % of students with special needs in public school. The same report shows Wisconsin having 14.8 % of students with special needs. This compares to a report by the Southeastern Wisconsin Schools Alliance (2006), which stated 9.56 % of children had disabilities in

1992-93. The broader guidelines of IDEA have increased the number of students requiring services and the severity of disabilities. More students with special needs are being placed in general education classrooms requiring teachers to find various methods to improve student-learning outcomes.

The Medford Area School District includes 12.6 % of students identified with special education needs (2006). Special education and related services are structured around the needs and services required by students identified with special education needs. Medford Area Elementary School (PK-4) provides special education and related services to students with disabilities through the following services: Early Childhood (4 1/2 day sessions), Emotional Behavioral Disability (K-4), Learning Disability (K-4), and Cognitive Disability Severe programming (K-4). Students are provided a free and appropriate public education in a least restrictive environment. Depending on a student's IEP, students may take part in pullout services and/or inclusion. Regular classroom teachers are often uncertain how to provide the most appropriate education possible for students with a disability.

The traditional method of presenting lessons through visual and auditory means is often not suited to learners with special needs. Students with special needs may have trouble with auditory lessons and often require more tactile lessons with increased visuals. They may also struggle with fine motor skills. The difficulty of providing needed curriculum in a modified manner is often aggravated by the lack of educational resources in regular classrooms. Additionally, the cost of providing services to comply with IEPs is increasing significantly according to the Southeastern Wisconsin Schools Alliance (2006). As the number of children requiring services increases, it is becoming more difficult for

teachers to accommodate the needs of students with a disability while continuing to meet the needs of the regular class.

Purpose of the Grant Proposal

The purpose of this proposal is to increase the amount of participation of students with special needs in the regular classroom through the use of an IWB. Learning can be enhanced through increased engagement using an IWB as an assistive technology device. Currently, in the Medford Area Elementary School there is no Interactive Whiteboard to show the benefits of this technology on student participation and learning. Additional research in the area of interactive whiteboards and the benefit to students with exceptionalities is needed.

Assumptions

It is assumed that an IWB can be a useful tool for all students in a kindergarten classroom. Other assumptions include a correlation between the use of IWB lessons and increased student engagement as well as participation. This paper will provide resources that describe how this type of technology can be used to assist students with special needs. At this time, there are no plans to submit the proposal for funding.

Definition of Terms

Terms included in this paper will be defined for those readers not familiar with the field of education and technology.

Disability. According to the Wisconsin Department of Instruction, a child with a disability means a child evaluated by an individualized education program (IEP) team as having mental retardation, a hearing impairment including deafness, a speech or language impairment, a visual impairment including blindness, serious emotional disturbance, an

orthopedic impairment, autism, traumatic brain injury, another health impairment, a specific learning disability, deaf-blindness, or multiple disabilities, and who needs special education and related services. (See also the definition provided by IDEA 2004 located in the *Statement of the Problem*).

ELL. English Language Learner used here is a term that refers to a person who has a first (home, primary, or native) language other than English and is in the process of acquiring English (The Education Alliance at Brown University).

Inclusion. Students with disabilities, or identified as needing individualized instruction, are served in their most least restrictive environment – the general education classroom.

Individual Education Program (IEP). A document prepared for any student, ages 3 through 21, who is eligible for special education services. IEPs are required by the Individuals with Disabilities Education Act (IDEA) of 1990. IEPs contain specific statements to include child's present educational performance level, the child's annual goals and objectives, special education and related services provided, the extent the child will participate in the general education program, method of progress measurement, and the date of initiation as well as the projected duration of services (National Dissemination Center for Children with Disabilities, 1999).

Interactive Whiteboard (IWB). An interactive whiteboard is a touch sensitive screen that works in conjunction with a computer and a projector (SMART Technologies, 2004).

Least restrictive environment (LRE). LRE means that a student with a disability should have the opportunity to be educated in the general curriculum with non-disabled

peers in the regular education environment, to the extent appropriate (Wisconsin Department of Public Instruction, 2008).

Pull-out Programs. "Programs that provide assistance (often remediation) to individual children by 'pulling them out' of regular classes" (Association for Supervision and Curriculum Development, 2002).

Tactile. Learning through the sense of touch.

Methodology

The paper is organized into four chapters. The first chapter includes an introduction, statement of the problem, purpose of the grant proposal, assumptions, definition of terms, and this statement of methodology. Chapter Two introduces research supporting the problem and summarizes the significance of the project. Chapter Three lists the goals and objectives of the proposed project. Chapter Four describes the project methodology to include an action plan and timeline. Also included in Chapter Four are an evaluation plan and tools, a dissemination plan, and a budget descriptive.

Chapter II: Literature Review

Background Information

"In recent years, demands have increased for serving all students with special needs within the regular classroom. This approach, called 'full inclusion', has placed more and more students with special needs in regular classrooms, requiring teachers to find ways to fully integrate their needs within the regular class without impacting negatively on the overall class structure" (Salinitri, Smith, & Clovis, 2002, p. 1). Creating inclusive environments, which are accessible to everyone, with or without disabilities, minimizes the need for individual accommodations (Thompson, Burgstahler, & Stewart, 2003). An

interactive whiteboard (IWB) would benefit all students and provide assistive technology (AT) to increase participation of students with special needs. The Assistive Technology Act of 1988 and IDEA 2004 define an AT device as any item, piece of equipment, or product system, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. An interactive whiteboard meets the definition of assistive technology.

An IWB is a presentation device that interfaces with a computer. An IWB system is comprised of the touch sensitive whiteboard, a digital projector, a computer, software, and the physical connection. The boards can be wall mounted or displayed on a separately purchased stand. The computer images are displayed on the whiteboard by a digital projector where they can be seen and manipulated. IWBs address the needs of visual, auditory, and tactile learners. The Medford Area Elementary School does not currently have this type of technology. An expansion of categories for special needs, an increase in the number of children requiring services, and an increase in the severity of disabilities are concerns facing schools (Southeastern Wisconsin Schools Alliance, 2006). Another concern is the increasing cost of providing services for students with IEPs. According to Wood, "Technology cannot address all the issues of teaching in an inclusive environment, but it does provide for new and innovative ways to learn (as cited in Basilicato, 2005, p. 1). There is a need for technology that would increase participation and therefore increase learning of special needs students.

Potential Benefits of Interactive Whiteboard Technology for Students with Special Needs

The Medford Area Public School District has created a goal to address the needs of students with exceptionalities. The goal is to plan, develop, implement and evaluate a

system to promote effective and appropriate use of assistive technology (AT) by students, families, and professionals. The aim of the district is to ensure use of assistive technology to improve the learning outcomes of children with disabilities. Technology does not need to be designed specifically for students with disabilities to be beneficial (Wood, 2005). Because of limited funding, school districts are not obligated to purchase a specific computer technology, even if it is identified as potentially beneficial (Hasselbring & Williams Glaser, 2000).

A project, "Students with Disabilities in General Education Classrooms: Their Experiences and Impact", supported by the Wisconsin Department of Public Instruction, recognizes that school districts engage in a variety of activities in an effort to provide their students an appropriate education (2002). The report addresses the unique challenges presented when developing programs to meet the individual needs of students with disabilities. This is especially true as programs to include students with disabilities in the general education classroom and curricula have been initiated.

The Medford Area School District structures its special education program and related services around the needs and services required by students identified with special education needs. The services allow flexibility. Some services are provided in a categorical setting in some instances and other services may be provided in a multi-categorical setting based on student's needs. ELL students may be serviced in a number of ways including pull-out, content based tutoring, or through translating. The World-Class Instructional Design and Assessment (WIDA) Consortium addresses English language proficiency standards and resources in their latest published guide (2007). "Support is an instructional strategy or tool used to assist students in accessing content necessary for

classroom understanding or communication" (p. RG-20). Support may consist of teaching techniques, visuals or graphics, and interaction with others using their senses to construct meaning. An IWB would be an example of a support system for ELL students and other students with special needs. The WIDA Consortium believes that "support is important for all learners to gain access to meaning through multiple modalities, but it is absolutely essential for ELLs" (2007, p. RG-20).

Educating students with a variety of different disabilities in the general education classroom raises numerous questions as to the impact this practice has for students with disabilities, those without disabilities, and those responsible for teaching an increasingly diverse student population (2002). "Assistive technology, while designed to improve the lives of students and adults with disabilities or differing learning abilities, can go far beyond reaching just the students who have identified learning difficulties. It can reach all learners and learning styles" (Barfield, 2003, p. 3).

SMART Technologies research on interactive whiteboards and learning (2004) shows how IWB technology addresses multiple learning styles and the varying abilities of all students. "Understanding the benefits of technology and how technology can help students learn can assist educators in supporting all learners, especially those with additional needs" (Ivers, 2003, p. 41). "Teachers who investigate the options of assistive technology...have found greater participation, involvement, and success for all of their students and a renewed feeling of power and possibilities for those who struggle" (Barfield, 2003, p. 3). According to Neal Starkman, in an article written for T.H.E. Journal, interactive whiteboards can be of enormous significance in the realm of assistive technology. Starkman describes how IWB's enable students with motor disabilities to

write on the IWB using their fingers or other instruments with touches that do not need to be precise. This feature reduces the stress of touching pencils for students with autism who have sensory perception difficulties (Barfield, 2003). Specially designed pens would allow students to draw, write, or highlight information if desired. The touch-sensitive surface allows access and the ability to control any computer application projected on the whiteboard (Ivers, 2003). "Primary students are drawn to interactive whiteboards where they can trace or create numbers and shapes, rearrange letters to make words, or work their way through a story, tapping a word to hear it read out loud" (Maloney & Haugen, 2006, p. 1). Learning can be reinforced through exercises using touch, movement, and space (SMART Technologies, 2006).

Additionally, English language learners (ELLs) can benefit from increased visuals compared to a verbally given lesson. Difficult or abstract concepts can be demonstrated or practiced with an IWB. According to Ted S. Hasselbring and Candyce H. Williams Glaser, multi-media can help deepen students' conceptual understanding by linking visual imagery with sound to information that is difficult to understand when presented solely by text (2000). The authors state research shows learning environments that incorporate dynamic images and sound are especially helpful for students with limited background knowledge. An e-interview with Kathleen Fay and Suzanne Whaley offers additional thoughts on ELL students, "Often English language learners are thought of as having limited background knowledge. In fact, they have background knowledge; it's just that it may be very different from some of their peers and teachers" (Delisio, 2006, p. 4). "Connected, organized and relevant information supports students learning of knowledge but also helps them develop higher-order thinking skills" (Lopez, 2006, p. 3). Dr. Lopez goes on

to say that ELL teachers need to use tools such as graphic organizers that support ELLs' development of higher-order thinking and skills. ELLs can assist memory skills through multimedia presentations that combine visual, audio, and text.

Using lessons that combine visual, audio, and interaction can be beneficial to all students. Active classrooms can appeal to three senses simultaneously through a variety of visual representations, sounds and the capacity to touch and interact with the board (Lopez, 2006). The visual aspect of an IWB is a common theme among the research literature. Visual learners can see the lesson components as it is taught, whereas those with poor visual skills benefit from the large display (Maloney & Haugen, 2006). The colorful technology and large screen would help students with attention issues as well as poor vision. Children with behavior disorders (BD) or attention deficit/ hyperactivity disorder (ADHD) can benefit from adapted color schemes that assist in capturing their attention (Barfield, 2003). Those same students have a platform that is visual, interactive and challenging (Starkman). Students with autism spectrum disorders may benefit from increased visuals as well. The large display makes it easier to see words, pictures, and objects compared to traditional lessons using books or large group activities. Students with some vision can manipulate the large displayed objects and use large text. Words can also be converted into typewritten text using the integrated handwriting recognition feature (Starkman). Students are engaged by the interactive nature and colorful visuals. All students become active participants in the lesson.

Motivation, Engagement, and Participation

"Motivation is best described as a student's drive to participate in the learning process" (SMART Technologies, 2004, p. 7). The sources of motivation differ. Some

students are motivated intrinsically to demonstrate knowledge. Intrinsic motivation can be thought of as learning for its own reward. Other students need an outside force to entice them in the learning process. Extrinsic learners are motivated by rewards. These extrinsic students are motivated by the "wow factor" of an IWB (SMART Technologies, 2004, p. 7).

"What The Research Says About Interactive Whiteboards" is a report that discusses the emerging literature on IWB's and their effective use in teaching and learning (Becta, 2003). It is important to note there is limited literature available in academic journals about the relatively recent interactive whiteboard technology. This statement still holds true today. Many research projects, undertaken by schools and local education authorities, provide research with information on IWB studies. According to the report, the research indicates increased motivation is seen as a key benefit due to presentational capabilities and interaction capabilities. Interactive whiteboards engage students to a greater extent than traditional whole-class teaching, which can increase enjoyment and motivation (2003).

Using technology to open a unit of study has been shown to stimulate interest and motivate students more than a traditional lecture or book approach (Barfield, 2003). Students enjoy the multimedia features and interactivity of an IWB (Gatlin, 2004). Gatlin also reports, that students pay closer attention and become more involved and motivated to learn. Other research noted student motivation and attention was the most significant attribute when using an IWB (Salinitri et al., 2002). Comments by a special needs teacher in the study noted students were more willing to attempt communication with the teacher and peers when using an IWB. Additionally, the IWB reduced anxiety of making errors

and increased participation. "Those with the most initial problems showed the most improvement in achievement and confidence, ergo increasing participation in their regular classroom" (p. 4). The "wow factor" of an IWB can capture student's attention and encourage motivation. When students are motivated, they are apt to be engaged in the lesson.

"Student engagement is critical to student motivation during the learning process" (Beeland, 2002, p. 2). Webster's Ninth New Collegiate Dictionary (1986) describes the act of being engaged as being involved in an activity or showing great interest. It is this type of engagement and active participation for which teachers strive. An IWB can motivate students to become engaged in learning due to its interactive nature. Intrinsically motivated learners enjoy demonstrating knowledge on the IWB as a means of showing individual achievement (SMART Technologies, 2004). Extrinsically motivated learners are enticed by the wow factor of technology and can become motivated learners as a result of the enjoyment they experience when using an IWB. "The more students are motivated to learn, the more likely it is that they will be successful in their efforts" (Beeland, 2002, p. 2).

Research observations, presented in a white paper, "Interactive Whiteboards and Learning: A Review of Classroom Case Studies and Research Literature", note the importance of student engagement (SMART Technologies, 2004). "Current learning theories promote student engagement and consider it to be a key component of knowledge construction" (p. 5). Students who are engaged have opportunities to be active participants in lessons presented with an IWB.

Interactive whiteboards facilitate student participation through the opportunity to

interact with materials on the board (Becta, 2003). Often, in a traditional lesson, students are sitting passively as a teacher instructs from a centralized position. Mobility may be limited by the proximity to a computer, chalkboard, or lesson materials. Proximity to students is important in creating an environment of working together as a community of learners (Solvie, 2004). Large group lessons using manipulatives may be difficult for students to view because there are just too many children gathered around a small area. "Having a space large enough for everyone to see opens a channel to higher student interaction in both teacher-directed and group-based exchanges" (SMART Technologies, 2004, p. 5). "Instead of a classroom setting where students passively receive information, the shared use of the whiteboard offers an environment where students and teacher can interact and communicate as a topic is explored" (Bell, 1998, p. 6). An IWB would permit the teacher to move around the room assisting where needed. Students would be able to see the screen easily and be able to view demonstrations. Students who are manipulating objects would be able to do so easily without having to use a computer mouse. An IWB allows more freedom in lessons previously constrained by traditional methods or individual computers. Interactive whiteboards allow computer-based learning without isolating students in front of individual computer screens (SMART Technologies, 2004).

"Interactive Whiteboards and Learning: Improving Student Learning Outcomes and Streamlining Lesson Planning", a white paper, expands on the hands-on approach of IWBs. Students can see and feel the shapes of letters as they write with their fingers. They can say the sounds that accompany the letters under teacher guidance. The use of multiple senses leads to increased engagement and greater understanding (Solvie, 2004). Hasselbring and Williams Glaser describe how technological devices can "make it possible

for students with disabilities to be educated in a regular classroom alongside their

nondisabled peers" (2000, p. 103).

Alfred N. Basilicato, in his article "Interactive Whiteboards: Assistive Technology

for Every Classroom", mentions studies showing favorable results for IWBs used as

assistive technology. "Educators are particularly happy with the improvement in

classroom participation" (2005, p. 2). An action research study by William D. Beeland,

Jr. indicates that the use of an IWB in the classroom leads to increased student

engagement. He goes on to say that the primary reason for increased student engagement

seems to be the visual aspects of the whiteboard (2002).

Students are not only engaged with the interactive nature of the whiteboard, but

also are encouraged to interact with peers. According to Hasselbring and Williams Glaser,

"The ability to collaborate on meaningful projects is especially beneficial for students

with learning disabilities because they often have both academic and social needs to be

addressed" (2000, p. 107). Students have the opportunity to learn from others, which is

especially beneficial to students with a limited knowledge base. "This interaction and

collaboration not only aids the learning process but also develops a child's personal and

social skills" (Boran, 2006, p. 1). Children with disabilities or limited English benefit from

the social aspect of the IWB. "Learning has typically been a social activity for the simple

reason that most human beings need to reinforce their beliefs and understandings by

asking questions of others" (SMART Technologies, 2004, p. 5). Collaborative efforts can

provide knowledge construction activities and actively engage students with learning

disabilities in the learning process (Hasselbring & Williams Glaser, 2000). The teacher,

when using an IWB, can easily facilitate large group lessons that showcase students'

sharing ideas and knowledge. Each student can be given opportunities to ask questions of others, show their strengths, and also to express themselves (2000).

The benefits to student learning through increased engagement and increased collaboration would also benefit teachers. Student passivity may be greatly reduced due to the interactive nature of the whiteboard (Cuthell, 2003). Other advantages to educators include the ease of use and the ability to move about the classroom during a computerized lesson. Teachers need not be stationed behind a computer monitor. Additionally, the software can be downloaded onto a Personal Computer (PC) so lessons can be prepared at home. Resource banks and lessons can be re-used and distributed through school networks for colleagues, students, and families (Cuthell, 2003).

Incorporating Interactive Whiteboards

A paper by John Cradler and Elizabeth Bridgforth discusses research findings regarding the effects of technology on teaching and learning (1996). They describe a review by Far West Laboratory (1994), which determined that the integration of technology into education had several student outcomes. The outcomes included increased performance when interactivity is prominent as well as improved attitude and confidence for 'at risk' students (1996).

Currently, there are wonderful interactive websites and learning software that help students learn the skills necessary to achieve academically. Kindergarten students can use computers to practice many of the pre-reading skills taught in the classroom. Students can click on matching rhyming pictures or fill in missing letter sounds for example. Computer technology offers students with different learning styles multiple methods of delivery. "For example, multimedia can help deepen students' conceptual understandings by linking

visual imagery and sound effects to information that is difficult to understand when presented in text alone" (Hasselbring & Williams-Glaser, 2000, p. 109). The Internet and various software programs allow students to view and manipulate digital objects on a computer screen.

The downside to using one-on-one computer technology with very young students is the limited availability of teacher guidance. One of the biggest challenges of computer-integrated learning has been maintaining dynamic interaction with students while they sit in front of computer screens (SMART Technologies, 2004). When students are being instructed in a whole group setting, the teacher is able to assist many students at once as the lesson progresses. Small group activities moderately divide the amount of help a teacher can offer, but children benefit from peer discussion and often solve their own problems. However, when students are at individual computer stations it is difficult to interact with peers who may be wearing headphones. The teacher not only is attempting to help students with academic questions, but also is often helping young students navigate the complexities of the computer. One classroom teacher struggles to assist individual children due to the isolated nature of the task. Teachers often find it difficult to spend significant amounts of time giving students with disabilities individual attention (Salinitri et al., 2002).

An IWB would help alleviate the constraints of individual computers. The instructor could use software or connect to a website which would be displayed on the large screen for all to see. The lesson could be demonstrated and students could take turns completing tasks that needed teacher guidance. With an IWB, students can "participate in computer-based learning in ways that would not be possible on a smaller computer

screen" (SMART Technologies, 2006, p. 9). Students with special needs would benefit not only from the undivided teacher attention, but also from their classmates who could model the task. Teachers see students interacting with the lesson presentations, while peer support has become more apparent with the use of an IWB (Cuthell, 2003).

When designing technological lessons, a teacher should take certain criteria into account. Access for students with special needs should be considered. IDEA (2004) supports the use of assistive technology to maximize accessibility to the general education curriculum for children with disabilities. Using an IWB in the classroom enables access to digital resources for the benefit of the whole class (Lopez, 2006). The lesson should also be engaging and encourage children to explore further. Teachers should also consider if the interactive potential is used to the best effect and if it helps create a sense of community (Wartella & Jennings, 2000). An article by Sarah A. Mulligan, lists recommendations from the Division for Early Childhood (DEC) when using assistive technology to enhance and improve the lives of children (2003). Assistive technology should be used to "help all children develop independence" in interacting with others, developing social and adaptive skills, and accessing the environment (p. 2).

Summary

As stated earlier, creating inclusive environments, which are accessible to everyone, with or without disabilities, minimizes the need for individual accommodations (Thompson et al., 2003). "More widespread use of technology would meet both the legal requirements and the spirit of the laws calling for students with special needs to be educated in the least restrictive environment" (Hasselbring & Williams Glaser, 2000, p. 119). IDEA (2004), declares one of the purposes of the amendment title is to ensure that

educators have the "necessary tools to improve educational results for children with disabilities by supporting system improvement activities" as well as "technology development".

The potential contribution of an IWB to students with special needs is significant. Inclusive classroom environments can be improved by offering engaging, interactive lessons to students with varying abilities. Such lessons would not only benefit students with disabilities, it would also support ELL students as well as the general education students. When discussing the benefits of an IWB to students with special needs, Matthew Pugh is quoted "to participate in the learning process helps students engage in a way that would not normally be possible in a classroom situation, adding to the richness of the learning experience" (SMART Technologies, 2006, p. 9). The components of an IWB system would address individual needs and promises improved educational results. Students would not be isolated in learning nor have the opportunity to sit passively. Both teachers and researchers alike record increased motivation or the student's drive to participate in the learning process. Technology can be a tremendous aid for a busy teacher trying to ensure that curriculum content reaches special needs students (Wood, 2005). Research supports the benefits of an IWB for students with special needs.

Chapter III: Project Goals and Objectives

The goals of this project are to increase focused attention and therefore, participation of students with special needs through the use of an IWB in a regular kindergarten classroom. Interactive whiteboards, used as assistive technology, can reach students with disabilities or varying learning abilities. It also provides visual and interactive support to ELL students. The combination of verbal, auditory, and tactile

learning will encourage participation and motivate students to learn.

The Medford Area Public School District has created a goal to address the needs of students with exceptionalities. The goal is to plan, develop, implement and evaluate a system to promote effective and appropriate use of assistive technology (AT) by students, families, and professionals. The aim of the district is to ensure use of assistive technology to improve the learning outcomes of children with disabilities. This research would address the goal of the Medford Area School District. The grant cycles of SMARTer Kids Foundation are not compatible with this paper and its timeline. This chapter will include the proposed goals of the project followed by the objectives to help achieve those goals.

Goal 1: Increase Attention Of Students With Special Needs Through The Use Of An Interactive Whiteboard In The Kindergarten Classroom

Students who are engaged in the lesson will be more apt to focus their attention on the lesson. It is assumed that increased attention will lead to increased participation. Research shows students are engaged by the visuals displayed on the IWB and the interactive nature of the technology.

Develop tactile lessons using an IWB. Lessons utilizing an IWB will need to be created. The lessons will be similar in nature to currently used traditional lessons. For example, both lessons might introduce a letter of the alphabet with pictures of items that begin with the letter. The IWB lessons and the traditional lessons will employ techniques to capture student attention.

Create a rubric to record student attention. The rubric will be used to record the amount of time students with special needs focus attention on traditional lessons and

similar lessons using an IWB. The rubric will also include a space for brief teacher comments that may be included at the conclusion of the lesson.

Goal 2: Increase Participation Of Students With Special Needs Through The Use Of An Interactive Whiteboard in the Kindergarten Classroom

Increased attention will presumably lead to increased participation of all students and specifically students with special needs. Students will be given opportunities to participate using the interactive whiteboard screen. Differing abilities will be considered to help all students achieve success.

Determine occurrences of participation of students with special needs. Students will be encouraged to participate in traditional lessons by the use of visuals and some manipulatives. All students will have a turn to answer a question, join the discussion, or move manipulatives if there is sufficient quantity of supplies. Amount of participation occurrences will be recorded on the rubric.

Students will be encouraged to participate in IWB lessons by the use of visuals and manipulatives located on the screen. All students will have a turn to answer a question, join the discussion, or move manipulatives. Amount of occurrences will be recorded on the rubric.

Goal 3: Analyze and Compare Data

A comparison of data will show a benefit regarding attention and participation, if any, for students with special needs (to include ELL students) when an IWB is used as assistive technology.

Compare data recorded on the rubric to show attention and participation. Data will be compared to analyze the number of times students focused attention for the various

lessons. Data on participation occurrences will also be analyzed by comparing number of times students with special needs participated in lessons that use an IWB versus lessons that do not use an IWB.

Goal 4: Project Goals And Outcomes Will Be Assessed By The Principal Investigator At The Completion Of The Project

Goals of the project will be reviewed in order to determine if a benefit is shown for students with special needs. Additional resources such as a student survey and teacher reflection journal will be used to assist in determining benefits of an IWB. Any benefits will be identified.

Create and distribute a survey to collect student perception of IWB lessons. A survey will ask students various questions to determine student perception. The teacher will read the questions and students will mark the choice that best describes their perception.

Teacher reflection journal will contain teacher perception of IWB lessons. A record of thoughts concerning what went well during IWB lessons will document teacher perception regarding the IWB. Concerns and future suggestions will be recorded.

Analyze rubric data, survey, and reflection journal. All documentation will be assessed and analyzed to determine IWB benefits when used as assistive technology. Particular attention will be given to data showing increased participation of students with special needs through the use of an interactive whiteboard.

Chapter IV: Project Methodology

Action Plan

The goal of this project is to increase participation of students with special needs

through the use of an IWB in a regular kindergarten classroom. The term special needs has been used in this paper to include students with disabilities as well as ELL students who have their own unique needs in a general education classroom. This paper has reviewed various sources to research benefits for students with special needs.

Research will be conducted to determine whether or not an IWB increases engagement of students with special needs. Student attention and participation will be measured using two instruments. The amount of time students' focus on a lesson will be documented on a rubric to determine student engagement. The amount of time students participate in a lesson will be marked on a similar rubric. A student survey will be given to determine student perception on the use of an IWB.

In addition, teacher reflection will be recorded to document the types of lessons presented, ease of delivery using traditional methods, ease of delivery using an IWB, teacher perception, and teacher observation of students.

Data will be analyzed to compare the rubric results of traditional lessons and IWB lessons similar in nature. The results will be used to determine any increase in student engagement and participation with the use of an IWB.

Timeline

Table 1: Projected Timeline

Organization & Planning Phase Activities	Beginning Date	Ending Date
• Contact district technology supervisor to install whiteboard	Aug. 2008	Aug. 2008
• Create rubric to record student attention and participation	Sept. 2008	Sept. 2008
• Begin teacher reflection journal	Sept. 2008	Jan. 2009
• Record amount of time students with special needs focus attention during *traditional lesson* of 15 minutes (collect data twice weekly)	Sept. 2008	Oct. 2008
• Record amount of time students with special needs focus attention during *interactive whiteboard lesson* of 15 minutes (collect data twice weekly)	Oct. 2008	Nov. 2008
• Record participation occurrences of students with special needs during *tactile lesson* of 15 minutes	Sept. 2008	Oct. 2008
• Develop 8 tactile lessons for the interactive whiteboard	Sept. 2008	Oct. 2008
• Record participation occurrences of students with special needs during *interactive whiteboard tactile lesson* of 15 minutes	Oct. 2008	Nov. 2008
• Analyze data by comparing amount of time students with special needs focused attention on traditional lessons vs. interactive whiteboard lessons	Jan. 2009	Jan. 2009
• Analyze data by comparing number of times students with special needs participated in traditional tactile lessons vs. interactive whiteboard lessons	Jan. 2009	Jan. 2009
• Identify benefits for students with special needs based on data	Jan. 2009	Jan. 2009
• Survey students to determine benefits	Jan. 2009	Jan. 2009
• Review teacher reflection journal to determine benefits	Jan. 2009	Jan. 2009
• Analyze data, survey, reflection journal to determine future use of interactive whiteboard	Jan. 2009	Feb. 2009
• Evaluate project goals in connection with writing a final grant report	Jan. 2009	Feb. 2009

Evaluation Plan

Several tools have been created to assess the benefits of interactive whiteboards in a regular kindergarten classroom. A rubric would record the number of times students with special needs focused attention during traditional lessons and IWB lessons. The rubric would also be used to record the number of times students with special needs participated in traditional lessons and IWB lessons. Data from the rubric would show if there were a trend toward increased student participation.

A student survey would indicate student perception regarding interactive IWBs. The survey addresses attention and participation regarding an IWB. Students can record perceptions on listening and concentrating during IWB lessons. Students can also share feelings about using the interactive whiteboard.

A teacher reflection journal would be the final article to assist in evaluating data. The reflection journal would be used to document the process, record areas of concern, and to reflect on student participation and any benefits observed.

Dissemination Plan

This proposal directly impacts students with special needs in the regular classroom. It also potentially benefits the families of those students. The project director will create and distribute a newsletter that will be mailed to the families of the students with special needs upon completion of the proposed project in February 2009. The newsletter will include data, student survey results, and reflective thoughts to summarize the use of an interactive SMART Board to improve student participation and attention to task. A translation of the letter will be provided to families of ELL students.

Copies of the newsletter may be sent to the Medford Elementary Principal, the

Special Education Administrator, and the District Administrator. A newsletter will also

be placed in the certified staff school mailboxes in August 2009. Data will be shared and

discussed in meetings with special education teachers in September 2009.

Project research has the potential to benefit regular classroom teachers, assisting

special needs teachers, and other educators of students with IEP's. Most importantly, the

research findings can be beneficial to many students with special needs in all grade levels.

At the completion of the proposed project, the project director would be responsible for

creating and presenting a report on the research findings. An informal meeting to inform

any staff interested in the research data and further implications could be held after

project completion. A presentation of IWB capabilities would be presented to various

grade levels as advised by administration.

If funding is provided, a written summary of the research will be sent to the

funding source June 2009. The summary will include data, student survey results, and

teacher reflection. Expected results will be compared with actual results according to the

analyzed data.

Budget

Table 2: Budget Request

Direct Costs	Description	Price
1. Equipment (purchase)	48" SMART Board 640	$999.00
	Mobile Floor Stand	$429.00
2. Other	Printing, copying, etc.	$25.00
Total Costs		$1,453.00

Budget Narrative

The increasing number of students with special needs in the public school system

requires additional resources to help them achieve academic goals. There are also an increasing amount of ELL students as reported in referenced research data. A SMART Board used as an assistive technology device can meet the needs of students with an IEP. An IWB is technology that can be used to meet the needs of all students as it is not specifically designed for students with a disability. The SMART Board can be used with an existing projector and computer to present interactive lessons for students. No additional funds will be necessary to continue this project beyond the timeline.

Equipment

An amount of $1,428.00 is requested for equipment expenses. These funds will provide a 48" SMART Board 640 ($999.00) and a mobile floor stand ($429.00). This equipment will be used to increase participation of students with special needs. The SMART Board will act as assistive technology to address the needs of visual, auditory, and kinesthetic learners.

Other

An amount of $25.00 is requested for other expenses such as paper, printing and copying. These funds will provide paper for individual rubrics that will determine attention focus and participation of students with special needs. Paper will also be used to survey students regarding lessons using a SMART Board. These funds will also provide printing and copying costs.

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Appendix A: Cover Letter

December 11, 2007

Program manager, SMARTer Kids Research
SMARTer Kids Foundation
1207–11 Avenue SW, Suite 300
Calgary, AB T3C 0M5
CANADA

Dear Program Manager:

I am pleased to submit a proposal to the SMARTer Kids Foundation requesting $1,453.00 in equipment and funds to support a special project, "Increasing participation of inclusion students with special needs through the use of an interactive whiteboard." The goal of this project is to enhance learning through increased engagement using a SMART Board as an assistive technology device.

The Medford Area Public School District has created a goal to address the needs of students with exceptionalities. The aim of the district is to ensure the use of assistive technology to improve the learning outcomes of children with disabilities. The issue of technology in education is important because of the benefits to all students and specifically to those students with special needs.

Additional research in the area of interactive whiteboards and the benefit to students with exceptionalities is needed. The result of this study would add to the limited research done with very young students. The cost of providing services to students with special needs in the regular classroom is increasing. If support is granted for this proposal, this study will assist to investigate the benefits of an interactive whiteboard on student participation and student learning.

Thank you for your consideration of this proposal. Please contact Kristin Anderson, kindergarten teacher, to answer questions or provide further information. I can be reached by phone: (715) 748-2316; or email: anderkr@medford.k12.wi.us. I look forward to working with you on this important initiative.

Sincerely,

Kristin A. Anderson
Kindergarten Teacher
Medford Area Elementary School
1065 West Broadway Avenue
Medford, WI 54451-1311

United States
Phone: (715) 748-2316
Email: anderkr@medford.k12.wi.us

Appendix B: Grant Foundation Proposal Request

Program overview
 The SMARTer Kids Research program supports action-based research projects conducted by educators. Action-based research allows educators to assess the effects of technology on teaching and learning, explore and test new ideas in the classroom, and investigate and practice new teaching styles. Completed studies may be published on the research page of SMARTer Kids Foundation of Canada's website.

Project duration
 Over a minimum of six months, each participant conducts a study of a learning environment that uses either the SMART Board interactive whiteboard, a Senteo interactive response system or a combination of the two. The project concludes with a final research paper detailing the study's findings.

Call for proposals
 Educators are invited to submit a two- to three-page proposal indicating their research question, projected timeline and research strategy, and the project's objective and detailed methodology. Potential areas of study include, but are not limited to, the following:

Curriculum development	Coaching
Students with disabilities	Collaboration
Gender and technology	Teacher training
Distance learning	Learning theories
Literacy programs	Students' participation in class

While the use of a SMART Board interactive whiteboard or Senteo interactive response system must be a component of the project, technology should not be the primary focus of the research. Instead, applicants should investigate the learning environment, learning outcomes or changes in students' behavior and attitudes.

To be successful, proposals will include the following:
 -A specific research goal
 -A description of technology as a tool, not a subject
 -A sound, rigorous research methodology
 -A focus on learning, teaching or professional development outcomes

Proposal requirements
 Please submit one copy of your proposal by mail or e-mail. Electronic submissions will be accepted in Word, Word Perfect or Text/ASCII formats only. All files must be uncompressed – please do not send files in ZIP, ZOO or SIT or other compressed formats.

Structure
The cover page of the proposal should include the following information:
<div align="center">

Project title
First and last name, and job title
Associated school name
Address, city, state/province, zip/postal code, country
Workplace phone number and e-mail address
</div>

The body of the proposal should meet the following requirements:
-Maximum of two to three pages in length
-Double-spaced
-Titles – bold 12-point Arial font
-Body text – 10-point Arial font

Please use the following categories below as subtitles and ensure the proposal addresses all questions.
Purpose
    What specific learning outcome is your research addressing? What is the objective of your project?
Background
    Why is this project important from a pedagogical perspective? What previous education experience or published research is relevant?
Research methodology
    What is your research strategy? How will it help you test your hypothesis? How will you control variables? How will you collect data? You may want to refer to other researchers who have used similar research methodologies.
Results and evaluation
    What results do you expect your project to produce? How will you evaluate your results? Please reference your institution's standardized testing or evaluation criteria as part of your evaluative process.

All proposals must fulfill the above requirements and address the category questions in order to be considered by the committee.

Research background
 Research information is available online from several education research organizations. Some examples are listed below.

No Child Left Behind website
www.nclb.gov/start/facts/whatworks.html

What Works Clearinghouse (supported by the U.S. Department of Education)
www.w-w-c.org

Provincial departments of education in Canada
www.edu.gov.on.ca/eng/relsites/oth_prov.html

Eligibility
North American pre-service and in-service teachers, graduate students, college

and university instructors and professors are eligible to apply. Applicants may apply as individuals or as teams. Teams must designate a team leader.

Applicants must have a computer and digital projector.

Deadline
Submission deadlines are as follows:

Submission deadline	Evaluation period
April 1, 2008	April 14-25, 2008
July 1, 2008	July 14-25, 2008

Applicants will be notified within two weeks of the corresponding evaluation period.

Successful proposals
The SMARTer Kids Foundation will loan successful applicants a *Front Projection* SMART Board interactive whiteboard and floor stand and, if it's appropriate to their research, a Senteo interactive response system to enable them to conduct their studies.

Participants will submit the following three reports during their research period:
-A detailed, step-by-step outline of their research strategy (two to three pages)
-A progress update, which may include preliminary findings (one to two pages)
-A final paper summarizing their research conclusions (not less than 10 double-spaced pages)

When all program requirements have been completed, the loaned product will be donated to the participating school at no charge. Participants' names, topics and final papers may be posted on the SMARTer Kids Foundation's website or SMART's website, or used or referenced in other SMART materials.

For more information and to submit a proposal, contact
Program manager, SMARTer Kids Research
SMARTer Kids Foundation
1207 - 11 Avenue SW, Suite 300
Calgary, AB T3C 0M5
CANADA
Phone 403.228.8565
Fax 403.228.2500
E-mail: info@smarterkids.org

Medford Area Elementary School
Kindergarten Student Survey: Interactive Whiteboards

Please put an **X** on the face below each sentence to show how you feel about Interactive Whiteboards.

1. I like when my teacher uses a whiteboard.

☺   ☹   😐

2. I listen better when my teacher uses a whiteboard.

☺   ☹   😐

3. I concentrate better when my teacher uses a whiteboard.

☺   ☹   😐

4. I like using a whiteboard.

☺   ☹   😐

*Teacher will write student answers to questions 5 and 6.

5. What do you like best about a whiteboard?

6. What don't you like about a whiteboard?

Appendix D: Attention Recording Chart

Record of Student Attention   **Date:** _____

Name	3 minutes	6 minutes	9 minutes	12 minutes	15 minutes
Teacher Comments:					

*Student attention is identified as listening to the teacher (not talking with peers), looking at the teacher, and looking at visual components of the lesson.

Appendix E: Participation Recording Chart

Record of Student Participation   **Date:** _____

Name	3 minutes	6 minutes	9 minutes	12 minutes	15 minutes
Teacher Comments:					

*Student participation is identified as responding appropriately when called upon and joining in the lesson by manipulating materials or demonstrating/copying lesson components through active movement.