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The Contribution of Music to Student Focus and Time-On-Task Behavior for Students Identified
with Disabilities and Whole Class Computer-Use

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Abstract

The purpose of this study was to evaluate the effectiveness of music playing for students identified with disabilities and their typically developing peers, during computer-use. The purpose of this research was to determine if music contributes to student focus and time-on-task behavior for all students during computer-use. The 17 participants in the study were 7th graders from a language arts classroom, some identified with disabilities. Music was played during student computer-use while completing activities during 25 minute sessions. Student on-task behavior was identified as students actively engaged in appropriate assignments. Target behaviors were identified, and data was collected on daily behavior charts recording: student on-task behavior during four, five-minute sessions; percentage of on-task behavior by class during each session; number of student completed assignments; and percentage of assignment completion by class, per session. Results demonstrate that music played during student computer-use was most successful in controlling student off-task behavior, and resulted in an increase in assignment completions. While some students reported disliking wearing headphones and listening to the music provided, the intervention has positive implications for assignment completion rate, and on-task behavior during computer use.

The Contribution of Music to Student Focus and Time-On-Task Behavior for Students Identified with Disabilities and Whole Class Computer-Use

Student off-task behavior in the classroom can impede learning. Many students exhibit off-task behavior in class. According to Stahr, Lane, and Fox (2006) off-task is characterized as disruptive behavior “creating lost instructional time for all students” (p. 201). Off-task behavior involves student engaged in behaviors not related to those set by the teacher. Common problems in schools according to Ertesvåg and Vaaland (2007) include off-task behavior, disobedient pupils, and bullying. It is these behaviors that interfere with teaching, are distracting to classmates, create an unsafe learning environment, and challenge the staff.

Many quick, intense changes and transitions are occurring for middle grade adolescent students (LeCroy, 2004). It is fortunate that, “over the past decade, there has been growing concern among researchers, clinicians, and policy makers about the overall health status of adolescents” (p. 427). Middle grade students often distract other peers, are hesitant to self-monitor their own learning, and lack school work motivation due to the increased independence granted at this age. It is these problems that make adolescence, “an ideal age group for preventive interventions to avert or delay the onset of problem behaviors” (p. 428).

Teachers often use rubric guidelines and checklists to reduce potential off-task behaviors, however some learners require additional motivators. Music is one such motivator used to promote student on-task behavior. Frequently, early education teachers use music themes in the classroom to promote student learning. This type of motivator in the middle grades is proposed to result in student progress and on-task behavior as music is a popular media utilized by individuals in this age group.

Research supports the assertion that students exhibiting off-task behavior frequently have disabilities and are often characterized as unfocused, unable to stay on-task, or unable to participate (Cripe, 1986; Dalton, Martella, & Marchand-Martella, 1999; Dempsey & Foreman, 2001; Gallegos, 2006; Pellitteri, 2000; Jackson, 2003; Rose 2005; Samuels, 2005; Sausser & Waller, 2006). If a student's off-task behavior is attributed to his/her disability, then needs and interventions promoting success in the classroom is likely to be included in his/her Individualized Education Plan (IEP). For these students, the use of music therapy may help them achieve success in the classroom. These students' needs are often met in the general education classroom; however, music therapy is an intervention typically delivered outside of the general classroom. Inclusion in the general education classroom is often the recommended environment to deliver student learning according to each individual child's least restrictive environment. Therefore, pull-out intervention therapy conflicts with the child's least restrictive environment.

There is a fine line between students who exhibit a delay in the classroom (at-risk) and those served under criteria specified in the Individuals with Disabilities Education Act of 2004 (IDEA, 2004). Further research is needed to determine interventions that will best suit all learners in the whole-class learning environment especially in the area of on-task behavior.

Off-task behavior is often a result of distracting environments. Environments that are especially distracting often allow for student independence and creativity. Occasions when computer-use in the classroom is encouraged, often requires individual researching and completion of activities, given little guidance and few guidelines. The unstructured nature of the assignment requires a great deal of motivation and self-monitoring be done by the student. In today's classrooms, student computer-use is critical, as much learning is related to technology.

Music used as an intervention to increase students' on-task behavior, therefore, is highly relevant for motivating all middle-grade students during computer-use.

Music Across Grade-Levels

Music and Early Education

As an effective learning strategy and motivational technique, music has contributed to the early education classroom. Early education teachers have often been documented as bringing music themes to the classroom for the rote memorization of elementary concepts such as the alphabet, friendly letter elements, geographic placements, and math facts. For example, the alphabet song provides students a mnemonic device for remembering sequences; other songs may be used to make connections through a particular concept (Pellitteri, 2000). The popular Schoolhouse Rock series used visuals and audio to educate students of all ages the fundamentals of language arts, mathematics, science, and history (Amazon, 2008).

Register's (2004) study investigated the connection between music, reading, and language in a study with kindergarten classes viewing televised episodes with and without live music. Findings indicated that live music interactions led to much higher rates of on-task behavior, allowing for longer periods of sustained student participation. In addition, teachers rated live music's effectiveness in student learning "excellent rating." According to Pellitteri, (2000), cognitive development, especially in the area of problem-solving that includes creative processing is engaged during musical activities. Activities requiring a child to create or mimic a sound or body movement "provide the motivation, affective stimulation, and structure to assist with these cognitive processes" (p. 384). Harris adds that educational tasks, other than problem-solving will benefit from the cognitive development supported by music therapy.

Since learning and music collaboration are shown to be successful for students in early education, it is reasonable to propose that other settings would also benefit from musical strategies. Pellitteri generalizes cognitive development to other educational tasks. Music therapy also supports cognitive development in the acquisition of initial skills. Teachers utilize Bloom's taxonomy to enhance knowledge at different degrees. Pellitteri's generalization provides support that middle grades would benefit from music-use, although there is little documentation of middle childhood grade level educators infusing music elements into the daily curriculum.

Music therapy improves student time on-task or increased attention span however; few researchers have examined music-use for middle-grade students (Cripe, 1986; Dempsey & Foreman, 2001; Eidson 1989; Gallegos, 2006; Pellitteri, 2000; Sausser & Waller, 2007) Music's impact on student success in class and on-task behavior has been found to be beneficial.

Although it is apparent that all middle grade students exhibit off-task behavior, not just students with disabilities; there is little research about typically developing students' off-task behavior. The lack of research greater signifies why research in this area is necessary. Since one long-term goal for all music therapy sessions is to increase on-task appropriate behavior across classroom settings, it is reasonable that music therapy techniques are brought directly to every general-education classroom to improve student on-task behavior and facilitate whole-class success.

Meeting Adolescent-Aged Student Needs

Music therapy programs are successful in enhancing self-expression, self-esteem, motor skills, coordination, and socialization (CEC, 1995; Cripe 1986; Eidson 1989; Gallegos, 2006; Pellitteri, 2000; Krout, 2007; Rose, 2005; Sausser & Waller, 2006). Adolescence-aged students need reassurance in these areas as they are critical skills required in one of the toughest social

scenes children will encounter. In Eidson's (1989) research generalizing desired behaviors from group music therapy to the home environment, it is suggested that, "making the adjustment to middle school is often difficult, even for emotionally well-balanced students" (p. 206). Sausser and Waller (2005) suggest that music also contributes to individual growth in creativity, inventiveness, independence, and success among participants. These are certainly areas teachers of the 21st century must expand on to offer students an authentic classroom learning experience.

Adolescent-Aged Students' Computer-Use Implications

Emphasis on technology-use in the classroom has been infused across all grade-levels, but it is in the middle grades where computer-use might possibly provoke off-task behavior. When students are participating in activities that often provoke off-task behavior, music might be especially beneficial in contributing to their classroom success. Computer-use encourages student independence, which offers a variety of self-selecting options and outlets for individual learning. This independence can sometimes lead students to be distracted and participate in off-task behaviors. A student's life outside of school includes video simulation games and social networking via the web.

Given access to the vast possibilities available on the World Wide Web, students are likely to exhibit off-task behaviors while exploring computer environments at school. According to Simpson and Clem (2008) commonly observed off-task behaviors in the classroom consist of peer chatting, alternative web searching, day dreaming, and computer game playing. To eliminate the urge to engage in this off-task behavior, immediate teacher feedback-informing students this is not the place for these activities, needs to be in place. It is unrealistic to assume that a teacher can sufficiently monitor all students' computers to provide this type of feedback.

Clem's (2008) study investigating *Video Games in the Middle School Classroom*, reported that, "Due to the individualized nature of the game play, students need to know and understand goals and objectives before they begin, which means that the teacher must have all activities lined up, with the relevant standards and assessments determined"(p. 10) to support students staying on-task. However, Dalton and Marchand-Martella's (1999) identified that providing self-management tools through assignment goals and objectives doesn't ensure student success and on-task behavior. Their research suggests that "while self-management procedures have found to be successful in increasing on-task behavior, academic productivity, and performance in special education settings, the generalization of treatment gains to the general education has not been consistently achieved" (p. 158).

Therefore, in addition to providing student expectations, an additional motivator is needed to influence student on-task behavior, especially for learning of students with disabilities who are often provided a variety of accommodations for their areas of need. All students need motivators to stay on-task during computer-use, in addition to task guidelines.

Music Therapy for Students Identified with Disabilities

Music therapy lends itself to assist in meeting the needs of students identified with special needs. According to the Council for Exceptional Children (CEC, 1994) since, "children will be educated alongside regular education children, and every child will have an opportunity for an appropriate and equal education," we must deliver direction that help students become productive and contributing members of society" (p.55) that may include a simple and easily integrated accommodation such as music.

Cripe (1986) suggests music therapy as an approach for students with special needs as it is a, "noninvasive, easily administered approach to assist these children through periods when

regular therapy cannot be applied is imperative” (p. 32). Research combining music therapy and education is often reported as being part of the music classroom or used independent of learning in the general education classroom, which can be a downfall to providing student learning in the inclusive classroom. Music could not only be provided outside the classroom but also be included in the general education classroom. Jellison, a music therapist asserts that all children “find joy in music and making music together” (Gallegos, 2006). When offering this intervention only in a pull-out setting, typically-developing students will not benefit from music exposure. Also without the inclusion of music therapy, neither typically-developing nor their peers with disabilities will be engaged in social interactions with children having abilities different from their own. Simply listening to music will not improve student social skills; however, the music exposure will create a social situation for all students to connect in, thus promoting peer relationships. In hopes of developing well-informed citizens who are respectful of others, an educator can use music to facilitate development of social skills involving students of all abilities. Jellison suggests there are many music activities teachers can create that are “purposefully structured for social interactions,” between all classroom students (Gallegos, p.47). Both students with disabilities and their typically developing peers will reap the benefits of music exposure when music is delivered in the general education classroom.

Music offers a great many benefits to students. The American Music Therapy Association (2003) suggests that music therapy utilized in conjunction with special education positively develops cognitive, behavioral, physical, emotional, and social skills. Often times according to students’ Individualized Education Plans (IEPs), students are removed from the general education setting to receive music therapy in an individualized or group setting to alleviate the effects of disorders such as Autism Spectrum Disorders(ASD), Emotional or

Behavioral Disorders(EBD), Attention Deficit Hyperactivity Disorder (ADHD), and Specific Learning Disabilities (SLD). The following presents research on the benefits of music therapy, and how these benefits contribute to student learning and development.

Everyone in Need of Relaxed State for Learning

Research suggests benefits of music include focusing students to the task at hand and relaxing them into a state of calmness. Forsythe (1977) suggests “attending behavior (concentration on or participation in surrounding activity) is a type of social behavior often regarded as prerequisite to academic learning” (p. 229). A lack of attention to academic learning in school may contribute to an inability to learn the task at hand. If academic learning requires concentration and participation, it is likely there are benefits to music intervention because music masks unwanted environment stimuli, thereby producing an environment conducive to concentration. As a state of concentration is needed for academic learning, a state of relaxation may be necessary for learning to take place in the classroom.

Music Acts to Relax

Because music reacts with various areas of the brain, its benefits are seen in several areas of the body. Heart rate, respiration, oxygen consumption, and blood pressure may all be effected by slowed or meditative music that “may induce these relaxing effects via interactions with the autonomic nervous system” (Krout, 2007, p. 138). Music that is perceived as relaxing is slow and has a stable tempo, volume must be low with soft dynamics and consistent texture and overall smooth progressions and rhythms. Smith (2004) identifies fifteen relaxation state (R-states) including: Sleepiness, Disengagement, Rested/Refreshed, Energized, Physical Relaxation, At Ease/Peace, Joy, Mental Quiet, Childlike Innocence, Thankfulness And Love,

Mystery, Awe And Wonder, Prayerfulness, And Timeless/Boundless/Infinite. However, how realistic is it for adolescents to identify with any one of these categories?

Another factor in achieving a desired state of relaxation is self-selection of music. Listener-preferred music has shown to have the greatest results in producing a desired state of relaxation according to activity. Smith's (2004) research involving 63 college students utilized a R-States Inventory self-report of students' state of relaxation while listening to either self-selected New Age music or classical Mozart music, practiced once a day for three consecutive days. New Age and classical music are often identified as containing the mixture of elements that often result in a state of relaxation. Half the participants were assigned to the control group by declining to listen to the suggested music. Reasons for declining were not specified by participants; however it can be assumed that participants' preferences were not substantially considered when the study was designed. Those who chose to listen to either Mozart or New Age music reported more relaxation-related states than those who did not listen. Mozart was shown to provoke greater results in relaxing states with significant numbers of sessions. Smith and et al. found the desired results were only accomplished as sessions were increased, emphasizing the effects music has on memory. In conclusion, for music to be considered relaxing and achieve the desired results, it must be self-selected by the listener and listened to over a period of time.

When the brain encounters relaxing music, there are beneficial results due to the music's interaction with the limbic system. There is a linkage between music-use and memory that promotes repeated states of relaxation based on the music experienced. Music and memory coincide because, "the limbic system is located in the temporal lobes of the brain, close to the auditory cortex where music and sound are processed" (Krout, 2007, p. 137). The amygdala is

well aware of situations during learning and the hippocampus plays a vital role in memory, therefore overtime the brain associates relaxed music with a person's relaxed reaction. The benefits of music not only exist to increase the individual's state of relaxation but also increase his/her their quality of health. Enhanced individual relaxation and masking may distract one from "existing stress or physical pain" (Krout, p. 136). Music that is slow or meditative will interact with the autonomic nervous system that releases hormones that combat stress and its' negative effect on wellness (Krout). Increased wellness is a positive attitude towards an active engagement in, one's personal health environment and wellness acts to balance internal and external environments which in turn affect one's physical health. Someone in a state of wellness and relaxation will likely be more open to learning or be able to more easily combat a stressful atmosphere. Since the school day is long, music can provide an opportunity for relaxation, preparing students for learning or relieving stress and bringing them to a relaxed state (Gallegos, 2006).

Gains from Relaxation

Gains in relaxation for students with disabilities are highly correlated with their capability to stay on-task during an independent learning assignment. Students with disabilities have positive experiences with music as they develop a real love for music and become actively involved in the musical experience resulting in pride and joy in achievement that can always be built on once comfort is attained (Voyles, 1995). One success story involving a child with Asperger's disorder and music identifies a successful experience requiring a careful and slow transition into the music experience being especially sensitive to an individual's pace (Rose, 2005). Individuals with Asperger Disorder (a disorder on the Autism Spectrum) find reflection in an atmosphere with musical background, as it can ease and calm them in social settings.

Children with autism who are characterized as having social and verbal dysfunctions, have shown to respond well to music, as they “are extremely motivated by it, and exhibit an unusually creative aptitude for it (Pellitteri, 2000, p. 385). Dempsey and Foreman (2001) suggest that based on Green’s 1996 research, behavioral intervention may be accepted as a more effective method for young children, while the studies identifying music therapy as effective are self-reports of adults with autism.

Published research concerning people with autism frequently looks at single case studies that can not substantially identify intervention effectiveness. One intervention program called *Giant Steps* builds on the “interrelationship between sensory system dysfunction and the symptoms associate with autism” (Dempsey et al., 2001, p. 112). Operating in several Western countries *Giant Steps* claims a 95% success rate and uses equipment and toys while providing partial inclusion with a great deal of professional support (i.e., a music therapist) however, further investigation is needed to confirm their claims.

Children and adults with emotional disorders have found music can ease moments of anxiety. Pellitteri (2000) suggests “research in neurological functioning supports the association between music and emotion” therefore the relax state developed by relaxing music will help those with emotional disorders and forms of anxiety (p. 380). Musical activities, “can relax a child with hypertense muscular contractions so to allow increased flexibility” (Pellitteri, p. 383). Research identifies gains linked to student achievement, demonstrating that music use should be considered in the general education classroom, since “music group experience can be enjoyed by students not needing special education and therefore can be used as a so-called normalizing mainstream activity” (Pellitteri, p. 384).

Students with Emotional and Behavioral Disorders (EBD) are often characterized as having short attention spans, low self-esteem and are easily frustrated, among other qualities, all of which interfere with their learning process. If students with these qualities are successful in an environment containing music, then music should be encouraged in enhancing the learning process of all individuals exhibiting EBD characteristics.

Students with EBD have needs in various areas leading to disputes on diagnosis, often mistaken for Attention Deficit Hyperactivity Disorder (ADHD). Since criteria for diagnosis is inadequate due to “vague terminology for assessing students and the severity of their disability” often students are denied services mandated by IDEA 2004. “Music is a motivating medium to use with students with EBD and music therapy services can provide an outlet for a variety of positive outcomes including nonverbal communication, structure for socialization, and school experiences in which a student can be successful” (Sausser & Walker, 2006). When music therapists are working with students with EBD, their sessions are not sufficiently guided by best practice due to minimal literature discussions on the topic (Krout 2007). A music therapy goal for students with EBD could include attention to task, that may require students to listen and create music, write lyrics, or play instruments. Research outlining music success mainly includes students with EBD participating in hands-on music making in music therapy sessions exclusively for students with special needs. Research investigating background music effects on students with EBD resulted in decreases in inappropriate verbal and motor behavior as well as decreases in inappropriate behaviors (Krout, 2007).

Intervention Versus Medication

There has been a trend in medicating students to treat ADHD, however noninvasive and less expensive alternatives can also be successful. Music therapy as an alternative can provide

greater student progress in valued classroom learning that is also helpful when meeting typical developing students' needs. Jackson (2003) states there are no distinct symptoms for ADHD, and individuals may be diagnosed with the disorder according to the following: "inattention, hyperactivity, impulsivity, poor behavioral control, learning difficulties, anxiety, and disrupted social interactions" which leads to little professional agreement on diagnosis or treatment (p.303).

Underserved Individuals

IDEA 2004 requires a persons' condition to interfere significantly with his/her learning and to occur in conjunction with other difficulties in order to receive services. In addition, there is no gold standard for diagnosis such as standardized testing, for ADHD. These factors result in a substantial number of people being underserved. Cripe's (1986) investigations of attention deficit disorder (ADD) suggested "accurate statistics are difficult to obtain due to heterogeneity of the group, overlap with other diagnoses, incidence of undiagnosed cases, and cases of misdiagnosis" (p. 31). Szegedy-Maszak(2004) and U.S. News and World Report indicate that there are "nearly 9 million adults who experts estimate have either attention deficit disorder or attention deficit hyperactivity disorder (ADHD)"(p. 1). Although diagnosis can come at a later stage in life, many adults report a long history of conditions characterized by these disorders, and are pleased to have finally been diagnosed. There is limited research investigating adult diagnosis for attention deficit disorder or attention deficit hyperactivity disorder; therefore, it is unclear whether adults who were diagnosed exhibited early conditions that were significant to indicate misdiagnosis as a child.

Little Indication of Medication Benefits

Students diagnosed with ADHD often are prescribed medication as a first step to treatment. Methylphenidate—a stimulant medication—is often administered for treatment, however alternative interventions such as music therapy have been found to demonstrate improvements for elementary students. Students with ADHD that are medicated are not demonstrating improvements in areas where academic mastery is substantially valued by national standards and benchmarks. Samuels' (2005) research investigated theories asserting that creativity and higher-level problem-solving are not affected by medication, and in the school setting benefits include only lower-level skills. Therefore, suggesting an alternative intervention is necessary to receive desired outcomes that are greater than just surface-level learning improvements.

The 21st Century classroom prepares learners with information delivery and interpretation utilizing Bloom's taxonomy spectrum. Learners are rarely expected to master lower-level skills such as perfecting handwriting, as computer-use offers a formal published piece of work, and rote mathematics is discarded after learning the initial skill. Learners must be able to apply prior knowledge and creativity to assignments, something not often accomplished by students with ADHD that are medicated.

ADHD medications may also be harmful to a child's health. Not only are parents concerned about a child's medication dependence, "the popularity of drug-free treatments also stems from the existence of conflicting information about the safety of long-term medication" (Samuels, 2005, p. 3). Internationally the use of Adderall has been prohibited due to fatal results in children and adults (Samuels). Alternative interventions for treating ADHD are less harmful to students.

One theory suggests that changing a child's surroundings or upbringing can promote change in a child diagnosed with ADHD (Samuels, 2005). Alternative treatments in addition to music-use are diet, exercise, herbal remedies, and biofeedback. Changing a child's surroundings is said to focus the student if the new environment is conducive to learning. An environment that will produce desired student learning includes one that is relaxing.

Music Therapy Intervention

Music therapy is a treatment that has been used to promote student success and on-task behavior. One survey investigating music therapy with elementary students with ADHD indicated that 37% of the 98 music therapists surveyed specified working with these children. When identifying the method of treatment, 32% reported using music-assisted relaxation (Jackson, 2003). The author does not clarify what the method looked like, but it can be assumed this is a technique involving music playing promoting relaxation. Survey responses also indicated music therapy as an effective treatment according to treatment outcomes, perception of responses of other professionals, teacher response, parent response, and child response. These children "crave stimulation and novelty" and how we go about delivering that is debatable but there are alternatives to medication-use (Samuels, 2005, p.39). Cripe (1986) also theorized and demonstrated the effects rock music has on decreased skeletal muscle tension producing children who "demonstrate a reduction in activity level and lengthened attention span" (p. 34).

Service Delivery

Students identified with ADHD must have identified needs in another category under IDEA 1997 to receive services, or if it's severe enough they can qualify under the OHI category. Many qualify for services due to the co-occurrence of a specific learning disability. According to Samuels (2005), *Attention Seekers*, the 1990 developed program by Dr. Ron B. Minson,

involves listening to Mozart while engaged in activities and has been found beneficial for students diagnosed with learning disabilities. Reportedly, Minson's program works under the assumption that learning disabilities are caused by listening problems, thus the audio stimulation is successful in increasing student learning.

Since music therapists "collaborate with all individuals who are involved in the education of students with special needs, including special and general educators," the focus then becomes how general educators can use these techniques in general education curriculum (CEC, 1995).

Dispute to Music Effectiveness in Upper Grades

Since the trend has been to use music in the younger grades to promote rote memorization, music use in higher grades has often been discouraged as it can be viewed as deterring student learning that at this grade-level requires application and inference. However, there are other musical forms appropriate for higher-level learning that can contribute to student focus, relaxation, and overall achievement. Music may be used in the background during learning at a soft volume. It is in this background form that music demonstrates qualities for providing stimulus and a potentially helpful intervention for all students during independent computer-use.

Methods for Reducing Potential Off-Task Behaviors

Rubric and Guidelines

Providing students with guidelines and examples have shown to increase student productivity and production of teacher desired student results, however this does not always appear transferable to independent assignment completion, especially for students receiving special education services and the generalization of skills to the general education classroom (Dalton, Martella, & Marchand-Martella, 1999). Student accomplishments can be measured

through the use of rubrics and checklists. These organizers provide students with the tools to succeed in the area of task completion. Outlining expectations is especially beneficial for students with special needs. Guidelines provide students with self-paced building blocks that may be utilized to focus on achieving academic success. It is unfortunate that expectation guidelines in the form of rubrics do not always ensure success; however, students may still be required to self-monitor progress and productivity. Some research suggests that students with and without disabilities, “can learn to use self-monitoring to regulate their own behavior and enhance independent activity” (Amato-Zech, Hoff, & Doepke, 2006, p.211). However, success in self-monitoring is directly correlated with students’ abilities to stay on-task, and students generally proscribed self-monitoring interventions have a tendency to be off-task. Interventions also frequently require an audio cue to prompt self-monitoring and this can not only be disruptive to other students, but reduce the effectiveness of the self-monitoring method (Amato-Zech, Hoff, & Doepke).

Checklists and Other Strategies for Monitoring On-task Behaviors

Students are likely to demonstrate off-task behavior during independent learning activities. Student accountability is difficult to measure during independent assignments because the teacher has to survey student progress individually. When students are not participating in direct instruction or in instances of independence, and are not directly interacting with teacher, they are required to follow through with completion of assignments. Often assigned activities are completed independently and are given a time limit. To ensure that students stay on-task often they will record their own behavior on a checklist.

21st Century Skills

Today's student learners are a different breed, "unlike their predecessors, they have literally grown up digital" (Simpson & Clem, 2008, p. 4). "Technology is an artifact of their culture," as it is used in many aspects of their everyday lives (p. 5). Computers are relevant to students in the aspects of writing and internet sourcing. Not allowing students to use technology tools in the classroom is an injustice not only to the students, but also to society's preparation for the future.

Computer as an Effective Reading and Writing tool

Although specific types of instruction are not suggested, the No Child Left Behind Act of 2001 (U. S. Department of Education, 2008) was designed to teach every child to read, and specifically promotes screening and early remediation to avoid enrolling children in special education. Register (2007) investigated early education students with specific disabilities in reading and engaged participants in a music/reading program. Their investigations in language arts instruction suggested that due to the varied reading instruction theories, "there is disparity regarding what type of instruction should be employed to accomplish these legislative objectives" (p. 24), however reading techniques should be closely aligned with state standards requirements. Student exposure to literature genres is a benchmark band in grades K-12 that can be enhanced with computer-use. Computer-use can increase the frequency and unique exposure to a variety of literary genres.

Language arts and Technology

Twenty-first Century standards-based learning require student mastery in skills that combine English language arts and technology. The National Council of Teachers of English and International Reading Association see eye to eye on 12 standards, the fourth emphasizing

writing skills- linked to technology for creating and communicating knowledge (LaBonty & Williams, 2008). LaBonty suggests that intense researching a unit topic is an authentic activity enhancing student's computer skills and expository writing skills, suggesting significance for using computers as writing tools.

Computer-Use Contributes to Writing

Several researchers have investigated the contribution of computer-use in the writing progression. Areas examined included spelling and writing piece length, but LaBonty (2008) suggests that if demands for technology skills increase, teachers will need to respond with instruction that promotes student technology competency, creating a demand that curriculum integrates computer use, in hopes that experiences in writing will make students more skilled with technology.

Scaffolding Learning

Computers can offer students a scaffolded experience using Word, PowerPoint, spreadsheets, online-researching, online-communicating, and web-browsing. Each of these skills has real-world application and skills transferable to a number of additional activities on the computer. With guidelines, students can be given the academic freedom to use the multiple computer functions available.

Presence of Individuality

Because teachers are usually responsible for evaluating greater than two classrooms full of students, they often require one method for students to display subject understanding, Martin (2008) suggests that teachers are aware that learners' pre-writing methods differ and "teachers recognize these elements of writing process but fail to put them in the context best suited to individual writers, instead insisting all students stay together in their progress toward

completion” (p. 15). Whether using a pencil or a computer, the method of completing assignments can be diverse just as the learners. The computer can provide a tool for students to relay information in a variety of different modes.

Independent learning encourages students to utilize multiple methods to display their innovative ideas; computers can increase student likeliness to demonstrate one-of-a-kind pieces. “When students are working with projects that integrate graphics and text, it is not unusual to see them start with the graphics or deliberate on a font choice then write for a time, until all new ideas are exhausted,” these visual attributes of the computer are particularly desirable for visual and verbal learners, as students know that all aspects of their product combine for the final product meaning (Martin, 2008, p. 15). Independent learning also allows student work and investigations to be authentic and self-paced. Independently led, self-paced learning is generally less-stressful and demonstrates student potential. As quoted in Martin, “students define the computer in terms of communication, thinking, and fun-ingredients that combine for predictable classroom success” (p. 17). These are just a few of the critical 21st Century skills students can develop while participating in activities using the computer.

Instructional Technology

Technology-use provides many benefits for students of all ability levels. Several accommodations for individual learning needs can be met with the use of a computer. Computers have the capability to make necessary application accommodations and adjustments to hardware to ensure all students can achieve success. For example Cripe (1986) suggests the use of headphones can be controlled at an appropriate decibel level and be used to meet the needs of one child.

Computer Internet-Use

Connection to the internet during computer-use prepares students for the real-world. Specifically, students can develop 21st Century skills. *Global Awareness* is achieved as students have no limits on the amount of information accessible in our small world. Computer-use can promote *Communication* and *Collaboration* among students and professionals through the use of email and web blogging. In addition, the unique dynamic of communication has shown to be most beneficial for students with emotional or behavior disorders and students with autism that lack the typical skills in communicating with others. *Creativity* and *Innovation* can also be applied during student computer-use. Martin (2008) asserts when using the computer, students can experience a number of learning outlets. Students are given experience in the fields of “text, sound, graphics, color, and voice” all of which contribute to their communicating, creating, and consumption of information (p. 17). For example students may be instructed to explore an on-line picture gallery displaying one Holocaust survivor’s portrayal of Auschwitz, and then asked to create their own interpretation of the Holocaust using graphics and photographs from on-line. The students have infinite possibilities in interpreting the question and creatively displaying their view of the Holocaust using the multimodal tools a computer provides.

If music contributes to focus and time-on-task for students identified with disabilities’, then student exposure to music during a time of high off-task behavior during computer-use will likely result in an increase in class on-task behavior for the whole class. Research identifies independent activities such as computer-use in the classroom as a contributor to students’ tendencies to get off task. While use of technology is often promoted, it can have adverse effects and lead students to be distracted. It is suggested that music promotes focus among students and calms the learning environment. There is little research investigating music’s function in a

learning atmosphere especially one that is computer-based. Therefore, this study investigated music's contribution to time on-task during student computer-use.

Statement of the Problem

In the researcher's classroom-based work, observations in a classroom of primarily students at-risk or identified with IEPs, indicate that independent computer-use is one instance-when independent learning encounters several barriers. As indicated earlier, music is an intervention utilized by music therapists to calm and focus students identified with special needs such as those with learning disabilities, emotional and behavioral disorders, and autism.

Intervention for At-Risk Students

Music can be enjoyed by students not needing special education services, and therefore can be used as a so-called normalizing mainstream activity (Pellitteri, 2000). Could the use of music also be utilized in the general education classroom to provide a positive atmosphere promoting on-task behaviors for all students, including-those identified with special needs, typically developing students, and those that may be at-risk? At-risk students are most likely to fail by today's societal standards (CEC, 1994) and researchers have identified the following as characteristics of youth that subsequently contributes to their risk of involvement with the juvenile justice system: "ethnic minority status, aggressive, antisocial behavior, difficulties in school and school failure (including educational disabilities), family stresses (i.e. poverty, single parent home, inadequate parental supervision, physical or substance abuse, living in a high crime community)" (Scott, Nelson, Liaupsin, Jolivette, Christle, & Riney, 2002, p. 2).

Since computer-based learning is an independent learning tool with multiple functions and necessary applications, students must demonstrate on-task behaviors to successfully navigate through learning activities. Shown to promote focus among identified students, the purpose of

this research was to investigate the effects of music on student on-task behaviors during independent computer use.

There is very little research investigating music's function in a computer-based learning atmosphere, especially in a general education classroom at the middle childhood level. Since students of all abilities are held to mastery of a standard-based curriculum, identifying an intervention that promotes success for all is an important issue. In addition, writing and reading content areas are vital to human development. Using music during computer-based learning activities was proposed to expand and improve communication for 17 learners using technology in the context of their language arts assignments.

Research Questions

This research was designed to explore and begin to document music's contribution to time-on-task during all students' computer-use. With little research in the area of on-task behavior during student independent computer-use, society will benefit from research inquiry in this area. Additionally, the standards-based curriculum requires computer research for learning. A number of useful and necessary 21st Century skills can be acquired from computer-use. Therefore, investigating time-on-task interventions is necessary. It is unclear whether it is the independent work atmosphere the computer provides, or if the computer itself is the main contributor to students' tendency to get off- task.

With these important outcomes in mind, this research was designed to answer the following questions:

1. Can music contribute to the learning of students unidentified with disabilities'?
2. How can music be integrated into students' use of technology?

3. How can music increase students' on-task behavior during activities when students are likely to be distracted?
4. What is the students' response to the use of music during classroom activities and what are their perceptions of their own progress?
5. Can instrumental music lead to further distraction?
6. Are students aware of their on or off-task behaviors?
7. How much do students' intentions to stay on-task contribute to the likelihood of staying on task?

Relevant Terms

This research references the following relevant terms:

Music therapy: “A systematic process of intervention wherein the therapist helps the client to achieve health, using musical experiences and the relationships that develop through them as dynamic forces of change” (Pellitteri, 2000, p. 379).

Music experiences: Include singing, playing various percussion, and listening to music.

On-task behavior: Completing work and having not to be asked more than once “What assignment are you attending to?” A child on-task should not need to be questioned or reminded twice in a two minute period.

Off-task behavior: Measured by any time the child is not focused on the activity at hand and needs to be reminded.

Class bookmarked Wiki: Explorations/student tasks found at

<http://hmcdonough.wikispaces.com/>

A web site with open access, that includes but is not limited to the following collaborative editing, web quests investigating, and student blogging.

Student blog: Website with open access and viewing for students writing shared in the form of “posts” and “comments.”

Hypothesis-

It was hypothesized that instrumental background music would contribute to time-on-task during independent computer-use for students with and without disabilities. In addition, it was predicted that peer modeling would set the tone for student reaction and preference to music during independent computer-use. It was also predicted that music during independent computer-use would lead some students to be further distracted. If students were shown to be less aware of their degree of off-task behavior, it was proposed that self-reflection and self-monitoring would contribute to overall student learning outcomes.

Music can be integrated into everyday curriculum in a variety of ways. When it comes to technology-use, this research proposed that music be used not only during student work time but during transitions and instructional time. It was predicted that students identified as “at-risk” by the classroom general educator would also benefit from music during classroom computer-use. This paper continues with a discussion of how music contributed to on-task behavior and student learning in one school in Southeastern Ohio.

Method

The purpose of this research was to determine student time-on-task behavior during computer-use while in an atmosphere enhanced with music. Data was collected to measure student time-on-task behavior during computer-use in an atmosphere with and without music. Aggregate group data was compared to determine time-on-task as measured by student engagement in an assigned activity. On-task behavior was demonstrated by student participation in corresponding tasks such as typing or reading, and successfully completing assignments as

measured by handing in a hard copy or internet drop box delivery at the end of class. Students were asked to respond to an open-ended survey requiring them to reflect. Students were given a writing prompt and were required to finish a statement describing their ability to stay on-task and identify factors that enhanced their ability to focus. The teacher assessed classroom progress according to assignment completion and based on the findings, made suggestions to colleagues about implementing music in other classrooms with the study participants.

Setting

This research was conducted in a general education classroom for 7th grade language arts students in a middle school in rural Southeastern Ohio. The middle school is located in a Southeastern Ohio district comprised of 1622 students housed in a single PreK-12 complex. Approximately 383 middle school students are enrolled (A. School District, 2004) with a student/teacher ratio of a little over 14 to 1. According to the 2000 census, 12.1 percent of individuals in region are below poverty level. The city is made up of approximately 97.6% people self-identifying as White, followed by Hispanic/Latino (0.8%), and Multiracial and Black (0.4%). The demographics of the study participants were closely aligned with that of the local population.

Description of Study Participants

The 17 participants involved in the study were classmates in a 7th grade language arts classroom with daily sessions meeting for 1 ½ hours. Of the 17 participants, 12 were typically developing, and five students had identified disabilities and were entitled to services under IDEA. Six of 12 typically developing students were considered “at-risk” by the general educator because of past grade-level evaluations and life conditions. Since many of the participants encountered family stresses including poverty; single parent homes, participants are part of a

“unique population of students who are at an elevated risk of school and life-long failure”(Scott et al., 2002, p. 532). Observations from previous teachers suggest students demonstrated delays in classroom performance and the demographic and behavioral characteristics of students require a variety of human services, including special education, mental health interventions, and child welfare services, in addition to intervention by juvenile courts. At-risk learners have a required data collection, through the use of progress monitoring and observing, data collection, and intervention strategy documentation. Some learners required additional investigation for student eligibility under IDEA and were evaluated with an initial screening.

A number of the children in the classroom were markedly below grade level in reading and writing and many needed more help than they were presently receiving. The classroom teacher was well aware of the students’ needs and accepted and ungrudgingly took on responsibilities for the prescribed intervention in hopes of helping all students in the classroom, since there was no time to offer the substantial individual intervention every student required.

Eight of the 17 participants were male and nine are were female. One student was a child of color and all others were Caucasian. The participants can be divided into three levels in the language arts classroom: exemplary, proficient, and partially proficient in relation to mastery of grade-level standards and benchmarks. Approximately 55% of students were at a partially proficient level for the majority of the school year. Prior to collecting data, students had been writing on a daily basis using a variety of genres including letters, poetry, lists, notes, autobiographies, narratives, and creative stories.

Students had basic keyboarding skills, however prior to the research few students had been regularly (daily) practicing their skills outside the classroom. As the use of music is frequently used in classrooms during regular instruction, it is not considered experimental in

nature and therefore did not require specific and active consent/assent for participation. Minimal potential risks were involved in this research because activities were derived from lesson plans aligned with curriculum guidelines and the 7th grade-Ohio Academic Content Standards-Language Arts.

Classical Music

Music classified as classical includes the following elements that correlate with music identified as relaxing: slow and stable tempo at a low volume with soft dynamics. Classical music has a consistent texture between sounds and instruments and simple harmonic progressions (Krout, 2007, p. 140).

Music Intervention

Student preference in music was not considered when creating the CD, however a variety of forms of instrumental music were selected by the researcher. The CD included music samples by classical composers, the majority were specifically selected and performed by the award-winning players of the Arcangelos Chamber Ensemble to enhance health and well-being (M. Logan, Personal Communication, May 29, 2008). The majority of the music was taken from a CD series entitled *Sound Health* developed by the Center for Psychoacoustic Research in conjunction with Advanced Brain Technologies. *Music for Thinking* has an average tempo of 50-60 beats per minute. Other music selected by researcher and included on CD was classical music from the movie soundtracks, “Finding Neverland”, “Reign Over Me”, and “Life is Beautiful.”

Students were provided with music on the CD to allow them to self-select individual songs. Having a selection of recordings to choose from is essential when attempting to gain a particular reaction to a piece. The music’s tempo needs to match the activity and according to the iso-principal, “then gradually moving in a desired direction” (Krout, 2007, p. 141). Music

from *Sound Health* promised to promote an atmosphere for thinking and music added by researcher was at a similar tempo. It was hoped that listening to the classical music provided would move students in a direction that promoted thinking; a desirable direction in a classroom environment.

Songs were presented together on one CD that resembled a self-selection. Students were encouraged to try out the CD, (skip around playlist) during the transition period to familiarize themselves with what music listening entailed, as to not distract them during assignment completion. Identifiers such as song title and artist were removed to prevent students from identifying their preferences and engaging in discussion regarding their interests.

Data Collecting Procedures

Student on-task behavior was defined as a student actively engaged in an appropriate assignment. Target behaviors were identified and data was collected by researcher on daily behavior charts recording student on-task behavior during four, five minute sessions. Data included the percentage of on-task behavior by class during each session, the number of student-completed assignments, and the percentage of assignment completion by class during each session.

Procedures

A three-week unit researching the Holocaust was utilized as the unit content. See Appendix 1. Students had basic keyboarding skills, so technology lessons prior to student computer-use included navigating through the Wiki source, significance and use of tool bars, Wiki method of accessing sources, use of the blogging application, copy and paste functions, and plagiarism prevention. Writing lessons incorporated instruction with a) brainstorming using a K-W-L approach (what I know, what I want to know, and what I learned) designed by Ogle

(Glazer, 1999); b)collecting and note-taking information; c)reviewing vocabulary; d) interpreting an images' greater message; e) writing for a purpose-correct point of view usage; f) using figurative language in poetry; g) identifying book themes, relating to self, and providing evidence; and h) identifying book plot, using foreshadowing and characterizations.

Following a prescribed agenda, students explored the provided sources for a greater understanding of the Holocaust. In an initial whole-group setting, the day's agenda, class goals, and instructions were displayed and discussed with class participants. Students were informed of the activity and time limit to complete the assignments at the computer station and the seat station. Most assignments were to be completed by the time the station ended, but additional time was given to students during recess if necessary. Students were eager to stay in to complete computer activities, so the researcher allowed it if a student displayed on-task behavior for four of five increments during one session.

Since only 10 computers were present in the classroom, only 10 students could use the computers at one time. Therefore students were randomly assigned to begin at the 'computer' station or 'seat' station during the class period. Once the day's agenda, class goals and instructions were discussed, a short presentation followed involving a technology or writing lesson. Given this unit was presented at the closing of the school year, lessons were usually concept reviews that were student-led as a means to build student presentation skills. A two-minute transition period followed each presentation allowing students to log on to computers, open required documents, and ask additional questions. At that point, the learning atmosphere was expected to be a quiet working environment, defined by students engaged in their work quietly; an environment promoting student learning, that does not distract other classmates.

Students not using computers were seated at their desks during the 25-minute session and participated in one or more of the following activities: individual conferencing, silent reading, formal writing piece revision, or completion of worksheet exercise.

Students at the 'computer' station visited Explorations A-J on the bookmarked class Wiki. Explorations are outlined in Figure 2 and involved student tasks such as blogging, wiki editing, word processor note-organizing, power point completion, website viewing, and video viewing.

Intervention Phase

Students completed computer explorations C-F during the intervention phase. In addition, while at the computer station, students wore headphones connected to the computer. Once students logged into their computer module, they accessed the internet and the bookmarked class Wiki page for instructions concerning retrieving music from a CD. Each computer contained a CD and had access to Media Player (a software program that plays back audio or video). Instructions required that students reload the CD and press play on the Media Player. Music volume was preset at a soft background level to ensure ease in listening as prescribed by Krout (2007). Students were given the option to raise the volume according to their preference, but the general education teacher advised students to leave the volume at the pre-set level, to discourage the students from being distracted by the music-player.

While at the computer station, students viewed the assigned Exploration, its goals, and task instructions. Goals identified three factors, the student, the form of media, and the purpose. Tasks were prereading, during readings, and postreading activities. Once the initial 25 minutes were concluded, students were notified to switch to the other work station. Students were able to easily transition since routine station and turn-taking had been practiced the entire year.

At the conclusion of the three weeks of observations, students were given the opportunity to share about the learning process on the computer. As part of an assignment in exploration J, a survey was posted for students to complete. The survey asked that students identify their music preference in the classroom. The next section presents the results of the music intervention described above.

Results

Data Analyses

Evaluating the data collected on behavior charts throughout the study made it possible to determine the average student on-task behavior and school work completion. Since students would be more familiar with procedures that corresponded with the music intervention, it was predicted that student on-task behavior would increase. A decrease in the number of class-wide off-task behaviors was expected, evidence by one of the following:

1. Discussion with neighbor unrelated to the assignment
2. Refusing to Work
3. Fidgeting with music sound volume or listening instrument for greater than 2 minutes
4. Exiting computer-use area for greater than 3 minutes
5. Questioning teacher regarding subject matter not pertaining to assignment

Observation Data

This study compared on and off-task behavior of students during 12 sessions. Sessions 1-4 were identified as phase A and were conducted without music. Phase B, the intervention phase had students listening to music during assignment completion and encompassed sessions 5-8. Sessions 9-12 followed as the B phase without music. Figure 1 provides whole-class means of on-task behavior and assignment completion per session.

Figure 2 and Table 1 do not indicate significant differences between sessions in either phase, therefore, a repeated measures mean analysis was used to analyze the whole-class progress from phase to phase. Table 2 shows means for all three phases of on-task and completion percentage.

While most groups showed progress from A-baseline phase to B phase (see Table 1), Table 2 indicates greatest improvements between phases with an average increase in whole-class on-task mean of 15% and a 23% increase in the whole-class assignment completion mean. A 13% decrease in student on-task behavior (mean by phase) was found after removal of the intervention. Similarly, a 23% decrease in assignment completion (mean) was shown once music intervention was removed. Table 2 represents mean scores by phase and reveals that during phase B (with music) students made the most progress on whole-class on-task behavior and whole-class assignment completion. Thus, findings of the present study confirmed that music intervention increased on-task behavior and assignment completion.

Table 1:

Whole-Class Student On-task behavior and Assignment completion by session Mean

Phase	A	A	A	A	B	B	B	B	A	A	A	A
Session	1	2	3	4	5	6	7	8	9	10	11	12
On-task Mean	76%	74%	76%	73%	87%	95%	95%	84%	84%	76%	73%	75%
Completion Mean	41%	29%	88%	53%	87%	65%	70%	82%	94%	47%	14%	59%

Figure 1:

Whole-Class Student On-task behavior and Assignment completion Mean

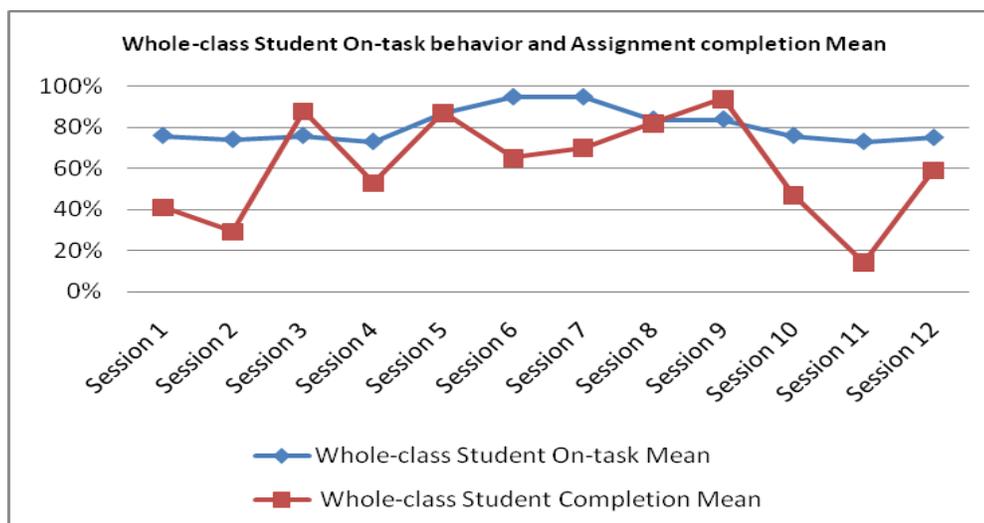


Table 2:

Whole-class Student On-task and Completion by Phase Mean

Phase	A (Session 1-4)	B (Session 5-8)	A (Sessions 9-12)
On-task SD ± 5 Mean= 81	75%	90%	77%
Assignment Completion SD ± 11 Mean= 61	53%	76%	53%

Baseline Data

The end of the year should be a time when students with disabilities and their typically developing peers are fairly familiar with classroom routines and schedules. However, there is a

chance that a classroom and its' students have not successfully melded to create a nurturing atmosphere, and establish a classroom plan that promotes student learning and comfort.

In the current study, there was no noticeable conflicting environment for student learning, however procedures for student learning were slightly shifted as this experiment was designed to involve classroom learning. Students had been previously using computers on a regular basis, but the structure and expectations relayed through computer explorations were unlike the students' prior experiences. Classroom observations, prior to the research showed much lower computer on-task behavior and assignment completion-rates. Other factors such as increased structure and predictable routines imposed through the research design may have interfered with overall experiment baseline results and data collection. An increase in class productivity may have been due to assignment design and structure.

Intervention Phase

In the second week, music intervention was utilized during task completion on the computers. At the time, students were familiar with computer routines and felt at ease when participating in the computer station explorations. Some students were reluctant to immediately follow music instructions once a new station session had begun. However, all students met the requested quiet working environment once the two minute station transition completed. Some students vocally offered opinions about wearing headphones and listening to music in the classroom during the intervention phase. Student complaints included: fear of getting lice, unhappiness with the music selection, and uncomfortable tangling of hair. The few students that complained about not wanting to wear headphones, chose to wear them on their shoulders. Students were allowed to wear headphones on their shoulders as long as the music could be heard from the headphones. Shoulder wearing was temporary and this approach to wearing

headphones did not interrupt other student's learning (otherwise it was identified as an off-task behavior). Only one student requested not to wear headphones throughout the entire unit and this student was removed from the data collection. Because this student completed assignments in an alternative environment and did not receive supervision from the general educator, this student was not included in the data collection.

During session 8, all students encountered some technical difficulties that interfered with both student ability to stay on-task, and ability to complete the exploration assignment. The school monitors student website viewing, and a temporary block was put on the Wiki website due to excessive hits or views from students.

Questionnaire Data

Upon completion of explorations A-I, students completed a questionnaire during exploration J. Since the general educator chose to utilize the studies' Wiki resource in their other classrooms, questionnaire's from an additional two 7th grade classes were completed. However, these survey responses were evaluated separately from the class studied and will be referred to as class B.

Students responded positively on the survey about music and computer activities. Prior to the study, students had rarely self-evaluated their behavior, nor had students been given significant feedback regarding their completion of activities. Therefore, students may not have had a sufficient understanding of the teacher's expectations concerning their behavior and task completion. Students rely on teacher feedback to understand their teacher's expectations and to have a realistic perception of their achievements and to do accurate self-evaluations (Butler, 1999).

Students had some regular computer experience prior to the researcher's study; however, students' computer-use in the classroom had not taken place on a daily basis prior to this study. Also, in the past while on the computer, students had not been given sufficient feedback concerning computer etiquette, nor had they been instructed on how to use the computer as an effective learning device. Therefore, if students had difficulty distinguishing progress in computer on-task behavior and assignment completion, they may not have been able to distinguish these differences in the questionnaire.

Questions 1-6 in the questionnaire (see Appendix 2: Student Questionnaire), allowed students to identify *never*, *sometimes*, *always* statements related to their music preference in the classroom, as it relates to concentration. The majority of participants (59%) indicated "sometimes" to survey questions 1, 2, 3, 4, and 6. Students responded "sometimes" to the degree of distraction in classroom and distraction during computer-use and whether they found music helpful in focusing their learning and were interested in future teachers using music in the classroom.

However, 35% selected "never" for the same questions, while only one student selected "always" for questions 1, 2, 3, 4, and 6. The majority of the class answered "never" to question 5. Students' responses to question 5 demonstrated that although students had indicated music-use as helpful when focusing their attention during learning tasks, they did not perceive it as something they would implement when completing their homework. Student responses indicated that students do not see the appeal of transferring this intervention to another setting because they believed it might be distracting. This may have been due to the fact that students believed they would not have access to instrumental music outside of the classroom. It should be reported however, that 71% of the students in the classroom requested and received copies of the CD

played during computer-use time. The researcher provided copies of the CD to students after they requested a copy.

According to the general educator, although Class B also had difficulty staying on-task, Class B did not contain as many students considered “at-risk.” The majority of students in Class B responded “sometimes” to survey questions 1, 2, 4, and 5 while the majority responded “never,” to questions 3 and 6. Survey responses from Class B likely demonstrate students’ awareness of their tendency to be distracted in the classroom. However, the majority responded that they did not wish to have this implemented in other classrooms.

Student Responses

In addition to question 1-6, students were instructed to complete sentence starters with a response that related to music preference and performance in the classroom. Responses from students involved in the study and in Class B will be discussed together as responses for both groups were similar.

Students who had completed the questionnaire replied similarly to LaBonty’s (2008) students’ responses. In the present study, students responded that they enjoyed the class calendar because it provided them structure and visually provided thorough directions and clear student expectations, keeping them organized during unit tasks and daily exploration. Students reported a sense of responsibility and accomplishment while at the computer station and reported they felt they were completing more work, more quickly during computer-use sessions. Several students also mentioned they were surprised that music had allowed them to concentrate. Students were pleased with the amount of computer-use they received during the Holocaust unit and reported they found the activities on the computer to be more interesting when listening to music. They reported they acquired greater knowledge from computer activities because sources provided a

great deal of information. Students preferred the choices provided to them during computer activities and were aware that their classmates have different reactions to the overall unit and resources.

Overall the statements students made when using sentences starters reflected their positive reactions to the Wiki page. What was conveyed from student surveys was students received a positive self-concept upon completing activities. Students were pleased with the layout of the Wiki page and some expressed how music contributed to their overall behavior when using the computer.

Because the researcher and creator of class bookmarked Wiki page received such an enthusiastic response from the general educator and students, the format of this Wiki page was used in the creation of a Wiki page for teacher resources. The teacher resource Wiki page and development of Wiki's are anticipated in to be a permanent part of the general educator's classroom.

Limitations

Limitations encountered during this include, but are not limited to the following: a) inconsistency in music delivery, b) lack of self selected music, c) inability to fairly assess off-task behavior, d) inability to fairly assess task completion, e) variation in student tech skills, f) time constraints imposed by the end of the school year, g) ability to monitor student computer-use, and h) student placement.

Inconsistency in Music Delivery

The research could not control the students' tendency to remove headphones, raise the volume, or continually change the song selection. Additionally, the researcher could not control

school interruptions such as school announcements, change in schedule, and interruption in access to technology.

Lack of Self-Selected Music

Students were not given the ability to self-select music on the CD and this may have increased their tendency to continually change song selection. Research also indicates that, “relaxation and stress reduction response has shown greatest response when listener prefers the music” (Krout, 2007, p. 140). Students may not have met the stage of comfort and relaxation needed for concentration that promotes academic learning. In addition, Locke (2006) lists playing mood music during student independent work but warns, “Some children may find this more distracting than helpful” (p. 307). Students that were recognized as being off-task may have felt distracted from their assignment at hand due to music listening.

Inability to Fairly Assess Off-Task Behavior

Martin (2008) comments that, “computers in the classroom, if integrated wisely, should cause our students to turn to others in an urge to share work, thoughts, and creativity”, it is understandable that students might be likely to share with their neighbor and thus students could be unfairly evaluated concerning their off-task behavior (p. 17). Researcher can’t fairly evaluate student behaviors because definition of off-task (inappropriate) behaviors is not clear. A great deal of student behaviors were coded as off-task if they behaved inappropriately at any time, but they may have been merely commenting on current learning. The researcher attempted to distinguish between conversations that were on-task rather than off-task, by circulating among the participants. In addition, students that were quiet (a characteristic of students identified as “at-risk”) may have been scored as on-task when they were actually exhibiting off-task behavior.

This is because students that are quiet are not displaying an inappropriate behavior (talking, walking away from computer) easily noticeable by the researcher.

Inability to Fairly Assess Student Completion

Since assignment completion rather than assignment grade were monitored, there is little evidence to make a correlation between student completion and mastery of subject area content. It is also suggested that as computer novelty wore off, students were less likely to display off-task behavior since they were familiar with learning objectives and requirements to complete assignments, therefore they would be less distracted due to predictability of daily tasks.

Tech Skills, Time Constraints, End of Year

Student skills with technology needed more guidance than could be provided an initial mini-lesson to increase student proficiency in technology. Students would have needed to participate in additional technology practice in order to accomplish computer activities with ease. It was anticipated that only a general English-language arts review of concepts would be required since the study took place at the closing of school year, but students indicated a lack of mastery of many concepts earlier taught which would have required a much broader concept review that could not be provided due to time constraints. The length of time and end of the year did not allow for adjustments to be made in the intervention application. Because initial phase A indicated a higher student rate of completion and on-task behavior than initially assumed by the researcher, allowing two-weeks instead of one-week for phase B would have been beneficial for demonstrating substantial student improvements in on-task behavior since increased exposure “to specific music leads to greater relaxation response” (Krout, 2007, p. 140).

Monitoring Student Computer-Use

Froeschle, Mayorga, Castillo, and Hargrave (2008) are counselor educators and authors of the *Strategies to Prevent and Heal the Mental Anguish Caused by Cyberbullying*, which investigates, “the more common danger inflicted via technology, cyberbullying”, because the reality is it is “relatively unknown to teachers and parents”(p. 30). Cyberbullying most likely takes the form of e-mail messages, social networking sites, chat room posting, and Web site postings (as cited in Froeschle et al., 2008). There was no known cyberbullying, known to the general educator or research that occurred during exploration activities. However, monitoring student computer-use appears to be one of the methods to ensure students don’t endure technology victimization since often filtering software does not prevent harmful communication between students. Since a significant amount of explorations were on-line collaborative efforts, requiring students to communicate with their peers through the internet, cyberbullying could have taken place during the sessions. It is suggested that in the future a program be presented prior to student computer-use that teaches students about computer safe uses and dangers involved in bullying. The researcher did create a page outlining student expectations for being a Wiki user and rules; informing students is advised, to ensure students awareness of no-tolerance policy for bullying.

Student Placement

Physical setting can be a concern as some off-task interactions are due to student placement at computers. It is important to identify child placement especially according to their proximity to students with disabilities. Children with learning disabilities may be impaired due to over-prompting from typical child (Gallegos, 2006). Student placement needs to be considered especially during independent activity completion.

Discussions/Implications/ Recommendations

Evaluation of Results

The research findings from this study contribute to our knowledge of student learning, specifically learning in the inclusive general education classroom. This research suggests practical outcomes for individual students in the classroom as findings can be passed on to the next grade-level classroom teachers. Specific recommendations based on findings include recommending instrumental background music practice during computer-use to other teachers. Other classrooms that appear high in off-task behavior may consider utilizing a music intervention, especially if a high-proportion of off-task students are identified as “at-risk.” It has been suggested to the district that teachers investigate music-use in additional general education classroom settings.

Implications

Research and this study indicate music contributes to all students’ learning. Pellitteri (2000) suggests music therapy needs to be including in IEPs. To accomplish this there needs to be an increase in the “inclusion of music therapists on multidisciplinary teams” (p. 384). Transferring the music therapy activities into the classroom can reinforce the benefits from the formal music sessions (Pellitteri, 2000). Music therapists should be involved in the implementation in both delivery formats through direct and auxiliary services.

Gallegos (2006) notes that Jellison views children as future adults and given that children and adults with disabilities tend to have a substantial amount of time to themselves due to a lack of social skills that would typically result in friend making, they may endure seclusion from society. This seclusion from society can also be seen in the life of a typically developing child especially in the lives of children who are “at-risk.” Music can provide a joyful experience for

all individuals that is transferable to new situations from childhood to adult life. Lock (2006) suggests using music to facilitate transitions between activities as it will insure ease in movement.

Overall, due to the specific on-task goals for participants, the activity completion frequency was found to be less relevant than class percentage of on-task behavior. Individual student on-task behaviors were determined to be less relevant to the data collection than the class mean occurrence of on-task behavior, because it is suspected that student on-task behavior contributes to whole-class student on-task behavior.

Student evaluation results not only contributed to overall success of the intervention but also provided feedback for future teachers about student preference to music-use in the classroom. There were not only short-term classroom gains from this study but ideally findings can contribute to each student's own study skill motivation and focus in the classroom for the following year.

Recommendations for Further Study

It is recommended that further studies be conducted investigating music-use in the inclusive classroom where the “teacher and therapist can mutually benefit from collaboration and discussion of approaches” (Pellitteri, 2000, p. 384).

It is suggested that schools' instructional technology experts be involved in future studies. Their support will maximize student activity on the computer. The researcher suggests honing open-communication with experts to ensure student access to all sources requested/posted.

There is also limited research investigating the use of music in the high school classroom. Research theorizes that similar on-task behavior interventions are needed at this level and that music could be beneficial to student learning. At the high school level, technology courses are offered, but must be student-selected. Could technology courses be made a requirement for all students, in hopes of training transferable 21st Century technical skills? How could music be implemented in a whole-class technology course?

Behavior intervention plans and interagency service plans alike should be based on functional assessment of student behavior and should target behaviors across multiple settings to promote success across life domains, thus monitoring specific targeted behaviors across multiple settings is required (Scott et al., 2002). Could investigations have students self-monitor their use of music in a home setting during daily homework completion? How does the reoccurring application of music to the learning atmosphere amplify student on-task behaviors in the classroom?

Summary

A review of the literature revealed little research indicating the use of music in the middle-grades classroom. Music therapy has been used in the education system as an exclusive intervention for students (receiving services according to IDEA 2004). The benefits that surround this intervention are found to be transferable to an inclusive classroom. Student benefits include an increased mode of relaxation leading to increase in concentration, on-task behavior, and task completion. Students in the general education classroom may be identified as “at-risk”. “At-risk” students can be susceptible to school or society failure. Since many disabilities indicated under IDEA 2004 have an assortment of characteristics, it is assumed that student’s considered “at-risk” may be misdiagnosed students with disabilities. Why should not

all students benefit from music intervention in the classroom? Music-use in the classroom is easy to implement and can address the needs of all students.

The study investigated a general education 7th grade classroom in Southeastern Ohio containing 17 students. The classroom included typically developing students, student's that had been identified as having disabilities, and students identified by the general educator as "at-risk". Music intervention included students wearing headphones to listen to classical-instrumental music while completing content-related activities on the computer. Students demonstrated increases in on-task behavior during computer-use and an increase in task-completion. Students responded positively to a survey concerning computer-use and the music intervention. Music listening during student computer-use provided an enjoyable classroom work environment for all student learners. Research indicated benefits to music-use in the inclusive classroom.

Appendix 1: Holocaust Unit Schedule

Holocaust Unit Class Schedule					
A phase Week 1: May 12-15		B phase Week 2: May 19-22		A phase Week 3: May 26-29	
Day	Topic/Activity	Day	Topic/Activity	Day	Topic/Activity
M	Introductions to wiki and blogging	M	Exploration C-Art and Propaganda -Powerpoint, blog	M	Exploration G- Book themes -blog
T	Exploration A- introduction to Holocaust -video view/KWL	T	Exploration D- child from Holocaust Journal writing -edit wiki	T	Exploration H- Book plot outlining -Powerpoint
W	Exploration A- continue to introduction -video view/KWL	W	Exploration E- class collaborative poetry -edit wiki	W	Exploration I- create student resource page -edit wiki
Th	Exploration B- Holocaust events/persons photo view -word organizer	Th	Exploration F- Webquest explore and evaluation -blog	Th	Exploration J- reflection on learning styles

Continue Appendix 2

Journal Entry

Individual Classroom Participation=the act of taking part in activities assigned

Reflect on your participation in class this week and complete the following statements with at least 3 sentences :

I learned that I.....

I was surprised that I.....

I noticed that I.....

I discovered that I.....

I was pleased that I.....

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