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A Pictorial Reinforcement Intervention Targeting Homework Submission, Completion, And Accuracy Rates Of Students In A Restrictive Classroom Environment

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A PICTORIAL REINFORCEMENT INTERVENTION TARGETING HOMEWORK SUBMISSION, COMPLETION, AND ACCURACY RATES OF STUDENTS IN A RESTRICTIVE CLASSROOM ENVIRONMENT

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by

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CERTIFICATE OF APPROVAL

DOCTORAL DISSERTATION

This is to certify that the Doctoral Dissertation of

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ABSTRACT

Although studies have shown that academic achievement is highly correlated with homework completion rates, many students do not complete their homework consistently. This study focused on increasing homework submission, completion, and accuracy by implementing a homework intervention which utilized pictures indicated as favorites by students on a reinforcement survey. The study used a single subject reversal design methodology. Six students from a Midwestern middle school restrictive classroom environment participated in this study. During intervention phases, students received daily homework supplied by their classroom teacher with a cover page attached to each assignment. When homework was returned to school the following school day, students received their next assignment with a picture from their reinforcement survey attached to the cover page. Data were analyzed using both visual and statistical analyses. Results indicated that this intervention was not powerful enough to increase homework submission, completion, or accuracy rates.

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INTRODUCTION

Homework has been a debated issue among teachers, parents, and students for decades. Although studies have shown that academic achievement is highly correlated with homework completion rates, many students do not complete their homework consistently (Trautwein, Köller, Schmitz, & Baumert, 2001). Approximately 28% of general education students and 56% of students with learning disabilities (LD) have trouble completing homework (Polloway, Epstein, & Foley, 1992). Moreover, students with emotional disabilities (ED) also have problems in this area. In one study, which utilized a homework completion intervention with 6 middle school students diagnosed with ED, only 2% of assignments were turned in during the baseline condition (Cancio, West, & Young, 2004).

According to the U.S. Department of Education (2002), half of all students with disabilities are educated in mainstream classrooms at least 80% of the school day. Approximately 450,000 students are classified as ED in American schools, with 23% attending self-contained classrooms for at least 21% to 60% of the school day, while 35% attend self-contained classrooms for more than 60% of the day. From 2000 to 2001, 2.8 million students received special education services for a specific learning disability with

50% of those receiving part or all of their education in a restrictive classroom environment. With so many students in self-contained classrooms, interventions that focus on homework submission, completion, and accuracy rates need to be conducted with this particular population. Past interventions, which have mostly been conducted with students in general education classrooms, have demonstrated that reinforcement is a practical tool to increase homework completion rates (Moore, Waguespack, Wickstrom, & Witt, 1994; Olympia, Sheridan, Jenson, & Andrews, 1994). Although reinforcement is useful, often teachers do not fully understand what motives their students to complete work (Daly, Jacob, King, & Cheramie, 1984). In order to alleviate this problem, a reinforcement survey in which students identify what is reinforcing to them individually can be utilized. Additionally, there are many different ways to reinforce students for completing their work. When students are younger, small inexpensive items may be used as reinforcement, but as students mature they may no longer accept these items as reinforcing, requiring teachers to implement other methods of reinforcement. One potential method would be to use pictures, such as a picture of the student's favorite pro-basketball star.

Although some studies have been conducted utilizing LD populations, very few focus on self-contained classrooms with a mixture of special needs students such as those with LD, ED, Autism Spectrum Disorders (ASD), and Other Health Impairments (OHI). Due to students in restrictive classroom environments having lower levels of academic achievement, implementing an intervention that would increase homework submission, completion, and accuracy rates would be efficacious. The current study utilized methods including a reinforcement survey, pictorial reinforcement, and homework layout

modifications that have shown to be effective for other student populations both disabled and non-disabled. The purpose of this study was to test the effectiveness of attaching pictures of items that students had indicated on a reinforcement survey to homework worksheets in order to increase homework submission, completion, and accuracy rates of students in a self-contained classroom environment.

Restrictive Classroom Placement

Students who are placed in restrictive classroom environments are those who generally have difficulty functioning academically or behaviorally in the general education environment. This can include students with ED, LD, OHI, and ASD. This placement decision is made by the case conference committee, which includes the student's parent or guardian. According to the Individuals with Disabilities Education Improvement Act (IDEIA, 2004), a student's education must be specifically tailored to meet his or her individual needs. This includes the child being educated in the least restrictive environment (LRE) possible. Additionally, the removal of a child with a disability from the general education classroom occurs only when the nature or severity of the disability is such that acceptable education in regular classes with the use of supplementary aids and services is not possible.

One particular reason why many students with ED are placed in more restrictive classroom environments is due to their inappropriate behaviors, which have led to suspension or expulsion from school for a period of time (Trout, Nordness, Pierce, & Epstein, 2003). A large percentage of students with ED in restrictive classroom environments have had encounters with the law at an early age. Alternatively, students with LD are placed in more restrictive classroom environments due to an inability to

learn at the same rate as their peers without disabilities or because of their lower academic achievement related to their disability. Although these two types of students have different diagnoses, their needs from special education are similar. Both ED and LD populations have below-average achievement in core content areas, deficits in basic academics, a general lack of motivation toward school, and difficulty with school-related skills such as note taking and test taking. Therefore, these populations are generally educated side-by-side in the public school setting (Sabornie, Cullinan, Osborne, & Brock, 2005). Moreover, students with OHI and ASD are also placed in more restrictive classroom environments. Generally these students require more structure and individual attention than general education students. Some of their disruptive behaviors such as talking out, engaging in repetitive movements, and fidgeting can cause these student's to miss important classroom materials, as well as distract other students.

When exploring placement decisions by age, students who are most likely to be served in the general education environment are those ages 6 through 11 years (U.S. Department of Education, 1995). Nearly half of these students are served in regular classroom placements compared to only 30% of students age 12 through 17 years. This discrepancy may occur because the overall environment and curriculum used in elementary schools is less complex, and behavior modification programs can be established and maintained in the individual classroom.

Students with Emotional Disabilities in Restrictive Classroom Environments

Serious Emotional Disturbance is an eligibility category named under IDEIA (2004). Under this act, it was mandated that students with this type of diagnosis receive special education services that are free and appropriate. After the mandate was

announced, each state in the United States developed its own label for this population with Indiana selecting "emotional disability" (Special Education Rules, 6, 2002). In order to have this diagnosis, Indiana law states that the condition must, "over a long period of time and to a marked degree, consistently interfere with a student's learning process and adversely affect the student's educational performance" (Special Education Rules, 6). Areas in which a student may have a deficit consist of, but are not limited to, depression, physical symptoms or fears associated with personal or school problems, inability to build personal relationships, and inappropriate behaviors or feelings. These findings must be evidenced in a comprehensive assessment, which may include standardized testing, behavioral/emotional evaluation, developmental history, and observation.

Characteristics of students with ED. Limited research is available regarding characteristics of and interventions for students with ED (Wagner, Kutash, Duchnowski, Epstein, & Sumi, 2005). For the information that is available, a congressionally mandated committee was assembled to review the two largest pools of data: the Special Education Elementary Longitudinal Study (SEELS) and the National Longitudinal Transition Study-2 (NLTS2; National Center for Educational Statistics [NCES], 2005; U.S. Department of Education, 2002). The overall outcome of these data showed that students with ED are more likely than other students to have characteristics that are generally associated with poor outcomes in education and life (Duncan & Brooks-Gunn, 1997; Trout et al., 2003). Some of these characteristics include living in poverty, having a single-parent home, presence of mental health needs, and being a racial/ethnic minority. According to Wagner et al., the researchers found that almost 80% of students classified as ED were male, and that African American students were more likely to be diagnosed.

The researchers also found that many students diagnosed with ED have severe deficits in the areas of social skills, academics, and language skills.

In addition to the congressional review, an updated study, which also used the SEELS and NLTS2 data, was conducted by Wagner et al. (2005). This study focused on the first sets of data that were collected through the longitudinal studies. Specifically, the researchers included the 6 through 12 year old participants' SEELS data, and the 13 through 16 year old participants' NLTS2 data. These data had been collected via telephone interviews with parents of the selected students using Likert scale answer options. Results indicated that African American students and males were overrepresented in ED classrooms compared to the overall population. In addition, students in ED classrooms tended to live in homes that had multiple risk factors for poor outcomes. These results were consistent with the previous study conducted by Donovan and Cross (2002). A new finding of Wagner et al.'s study revealed that 33% of the students lived in a single parent home, 20% of them lived in a home that was headed by someone who was unemployed and not a high school graduate, and the majority of students with ED lived in homes with economic stress. Another finding indicated that nearly 45% of students with ED lived in a household with another person who has a disability. Moreover, 33% of the elementary and middle school students with ED and 66% of high school students with ED had attended at least 4 different schools in their lifetime. With deficits in many key areas and a combination of risk factors for poor outcomes, there is a definite need for more empirical research focused on students with ED.

Academic achievement of students with ED. The ED population has an especially high drop-out rate of 51%, which is higher than any other disability category and approximately 40% higher than the general education population (U.S. Department of Education, 2002). Moreover, students with ED are said to experience the least amount of school success overall (Landrum, Tankersley, & Kaufman, 2003). This group of students earns the lowest grades and fails more courses than students in other disability categories.

Classroom placement of students with ED. Historically, students with ED have been placed in restrictive non-inclusive environments due to their inappropriate behaviors and academic problems (Trout et al., 2003). More recently, there has been a push for integration of students who are disabled and non-disabled in the classroom, resulting in a shift in placement for students diagnosed with ED. Approximately 82% of students with ED are currently being educated in regular school buildings, with 26% of these students spending less than one-fifth of their day outside the general education classroom (U.S. Department of Education, 2001). Although there has been a shift in placement from restrictive to inclusive, more students with ED are still being educated in separate class settings than any other disability category. Landrum, Katsiyannis, and Archwamety (2004) found that between 1988-1989 and 1997-1998 there was a slight decline from 56% to 51% in the percentage of students receiving education services in a separate setting (i.e., special classes, special schools, residential facilities, hospital setting, homebound placements). This can further be broken down into 31% in separate classes and 25% receiving resource room services. In 1997-1998, 33% of students with ED were receiving services in a separate classroom compared to 20% of students in all other

disability categories combined. In addition, 3.7% of students with ED received services in a residential facility, compared to only 0.7% of students in other disability categories.

When comparing restrictive academic environments for students with ED to regular education classrooms there are a few noticeable differences. At the middle school and high school levels, students in restrictive environments do not switch classes for core academic subjects like their peers do. This may be due to their inability to sustain appropriate behavior outside a highly structured setting. Additionally, restrictive environments for students with ED generally have a social skills component built into the curriculum (Panacek & Dunlap, 2003). For those students with ED who are in general education classrooms and require social skills training, they either participate in a social skills group at the school or do not receive these services within the context of the educational environment. Moreover, in restrictive environments there is a lack of opportunity for normal social interactions between students. Knitzer, Steinberg, and Fleisch (1990) found that it is possible for students in a classroom for students with ED to go all day without a single positive social interaction with another child or adult unless it is social skills time. This may be due to stricter policies and rules in restrictive environments that are needed to alleviate disruptive and inappropriate behavior.

Student with Learning Disabilities in Restrictive Classroom Environments

Currently, over 2.8 million students in American schools have been diagnosed with a specific LD (Bryan, Burstein, & Bryan, 2001; U.S. Department of Education, 2001). Over a ten year period from 1987 to 1997, there was a 42% increase in the number of students diagnosed with LD. With such a significant increase in the number of students

having academic difficulties, the number of students being placed in restrictive classroom environments due to this diagnosis has increased.

Characteristics of students with LD. Students with LD can have a wide variety of academic difficulties in a number of areas including reading, math, and written expression. Many of these students are referred to special education after demonstrating unexpectedly low academic progress in the general education environment (Bryan et al., 2001). Additionally, students referred for LD often demonstrate maladaptive classroom behaviors. Some teachers believe the behavior problems occur due to the student's inability to complete academic tasks. According to Bryan et al., students with LD generally are off-task, disorganized, and have verbal expressive language deficits. A combination of these problems in the home environment can lead to incomplete homework assignments. As an example, students diagnosed with LD spend up to two hours completing homework assignments that their siblings can complete in approximately 15 minutes (Baumgartner, Bryan, Donahue, & Nelson, 1993).

As students with LD advance through their education, they begin spending less time on homework in comparison to their peers without disabilities (Bryan et al., 2001). These students also develop lower expectations for their own success, and do not see success as a function of their own hard work and abilities (Pearl, Bryan, & Donahue, 1980). Moreover, Bryan et al. suggest that students with LD view learning through take-home assignments as a burden, while their peers without disabilities see homework as fulfilling and important in their daily lives. Surprisingly, middle school students with and without disabilities stated that "giving different, fewer, or shorter assignments" was not something they wanted teachers to implement when altering homework. Students with

LD expressed that they should be rewarded with good grades for completing homework regardless of accuracy.

Academic achievement of students with LD. Students with LD by definition have significant academic achievement difficulties in one or more academic areas. The LD population has a drop-out rate of approximately 39%, which is lower than the ED population's rate, but substantially higher than the general education drop-out rate of 20% (U.S. Department of Education, 2001).

Classroom placement of students with LD. Students with LD who are placed in restrictive classroom environments generally have more academic difficulties and may exhibit maladaptive behaviors in the general education environment (Bryan et al., 2001). When these behaviors begin to disrupt the learning of students without disabilities, the student with LD may be placed in a more restrictive setting. Therefore, 50% of students with LD receive their education in a restrictive classroom environment. These students require additional or modified instruction of classroom materials, and they may need supplementary modifications, such as a scribe or someone who will read materials or tests orally.

Students with Other Disabilities in Restrictive Classroom Environments

According to IDEIA (2004), there are a number of disabilities a student may have that can result in their being educated in a more restrictive classroom environment. For example, the diagnosis of OHI is given to students who show impairment that adversely affects their "educational performance and is manifested by limited strength, vitality, or alertness due to chronic or acute health problems" (Special Education Rules, 12, 2002). Alternatively, the student may show signs of "heightened alertness to environmental

stimuli that result in a limited alertness with respect to educational performance" (Special Education Rules, 12, 2002). From 2000 to 2001, approximately 291,850 students were receiving services for an OHI diagnosis (U.S. Department of Education, 2002). In addition to OHI, some students with ASD are educated in restrictive classroom environments. The U.S. Department of Education (2002) reports that from 2000 to 2001, 78,749 students with the diagnosis of ASD were enrolled in U.S. schools.

Characteristics of students with other disabilities. The OHI diagnosis, which is generally associated with ADHD, is given to students with substantial attention or hyperactivity problems seen in multiple settings by numerous individuals. Other characteristics that these children may exhibit within a classroom environment include being forgetful, disorganized, distractible, easily frustrated, and impulsive. Teachers often indicate that these students will attempt to complete work without hearing all directions or will impulsively respond to questions without contemplating a correct answer. Students diagnosed with ASD experience varying academic difficulties based on the severity of their disability. Nonverbal students often experience more difficulty in school than verbal students.

Academic achievement of students with other disabilities. Students diagnosed with ASD range in academic ability level. Generally, students on the more severe side of the spectrum experience more severe academic difficulties. Also, students diagnosed with OHI experience lower levels of academic achievement than their same aged peers. This can be varied based on the symptomology that the student experiences.

Classroom placement of students with other disabilities. For students with OHI to be placed in a restrictive setting, their behavior must be severe enough to inhibit their

learning or the learning of their peers in the general education environment. For students with ASD, approximately 40% of these students spend at least 40% of their day in mainstream classrooms. In contrast, 60% of students with ASD receive services in restrictive classroom environments (Dybvik, 2004).

Theoretical Framework

Behaviorism, a theory that became popular in the early part of the twentieth century, focuses on studying observable behavior scientifically without exploring internal mental states (Pierce & Cheney, 2004). The two main theories of behaviorism are classical conditioning and operant conditioning. Classical conditioning theory, which was developed by Pavlov, is built on the idea that one can create relationships by association through repeated exposures, which in turn creates a conditioned reflex (Pierce & Cheney). As an example, if every time a student sees her teacher putting away a textbook, the school bell rings for class to be over, the student will soon associate the teacher putting reading materials away with time to leave the classroom. In this case, once the teacher putting away her book and the school bell have been paired multiple times, the student will begin to leave the classroom without the school bell ringing. Following Pavlov's research on classical conditioning was Thorndike's law of effect (Pierce & Cheney). This law states that all behaviors may be followed by consequences that increase or decrease the probability of a response in the same situation. Thorndike's law of effect was incorporated years later into Skinner's more popular operant conditioning theory. Operant conditioning, also known as reinforcement theory, states that when a behavior is followed by reinforcement the behavior is more likely to occur again in the future, and if the behavior is followed by a consequence it is less likely to occur again in

the future. For example, if a student receives a sticker on an assignment because she turned it in on time, and the sticker is truly reinforcing, then the student will be more likely to turn in homework on time again in the future. According to behaviorists, both classical conditioning and operant conditioning are the methods by which humans learn.

One technique for changing behavior within behaviorism is behavioral modification. Behavioral modification is "behavior change resulting from the systematic application of behavioral principles" (Kalish, 1981, p. 3). The following six principles are the underlying factors that support behavioral modification (Sundel & Sundel, 1993). First, the participant takes an active approach in solving the problem. This means that the participant is in charge of making the transformation and is not being forced to change. Second, behavioral modification uses an individualized program for each participant. This may include a different intervention for each participant or a different set of reinforcers that are specific to that participant's needs. Next, all participant behavior needs to be monitored and assessed, and all controlling conditions must be in measurable terms. For example, if a control variable in the study is the number of rewards a student may receive in one day, then that control variable must be stated in a way that is measurable, such as a maximum of two rewards per day per student. Fourth, all methods of increasing positive behaviors and decreasing negative behaviors must be empirically validated. This would include using operant conditioning or classical conditioning to change behavior responses. Fifth, all intervention programs need to be short-term and time-limited. Behavior modification is to be used only for a short period of time to establish the desired behavior. Finally, all behavior should be assessed in measurable terms. This permits for progress monitoring of participants over time and conditions.

Punishment

From the behaviorist perspective, behavior is viewed as controllable by either punishment or reinforcement. Punishment is the term used to describe a situation in which an aversive stimulus decreases the rate of response (Pierce & Cheney, 2004). A punisher is anything, such as a spanking or nagging, which decreases the rate of a behavior. There are two types of punishment that are recognized in behaviorism. Positive punishment occurs when a punisher is added to a situation and the results of that aversive stimulus being added decreases the likelihood that the behavior will occur again in the future. For example, if a child runs into the street and a parent spanks the child for the behavior, the child will be less likely to run into the street again if the spanking were truly punishing. Negative punishment is the other type. For this to occur something is taken away from the situation and the behavior should decrease. An example of negative punishment includes having a parent take away a child's television privileges because he hit his sibling. The behavior of hitting would be less likely to occur again in the future if the action of removing television privileges were truly punishing to the child.

Reinforcement

Behavioral modification relies on two different types of reinforcement. One type is positive reinforcement. The concept behind positive reinforcement is that by adding something to the situation, such as an item or verbal praise, the desired behavior will increase resulting in a decrease of undesirable behavior. For example, if a student receives a sticker from her teacher after cleaning up a mess, the student is more likely to clean up again in the future if the sticker were truly reinforcing. The other type of reinforcement is negative reinforcement. This occurs when something is taken away in

order to increase a desired behavior and decrease an undesirable behavior. For example, if a mother removed an ongoing fire alarm after her son cleaned his room, the son would be more likely to clean his room in the future if the removal of the fire alarm were truly reinforcing. In both cases, reinforcers can include words, facial expressions, tangible items, and proximity as long as they increase a participant's behavior. Skinner, who developed the concepts of reinforcement and punishment, advocated for the use of positive reinforcement over punishment. He determined that positive reinforcement had long lasting effects, while punishment only worked for short-term change (Pierce & Cheney, 2004).

Reinforcement schedules are an aspect of reinforcement that can have an impact on an intervention's success. A reinforcement schedule determines when a reinforcer will be presented. There are three different types of reinforcement schedules. The first schedule is continuous reinforcement, whereby every response is followed by the reinforcer. Second, intermittent schedules provide reinforcement at some points when the behavior is emitted and not at others. Within this schedule, the researcher can select at what interval or ratio he or she would like the participant to be reinforced. When selecting an interval schedule, the researcher has the option to select either a fixed interval, which remains constant throughout the study, or a variable interval, which allows for a different interval to be selected each time. Alternatively, if the researcher implements a ratio schedule, the ratio of reinforcement to non-reinforcement implementations can either be fixed or variable. Finally, extinction schedules provide no reinforcement for behaviors, therefore causing the behavior to cease.

Pictorial reinforcement. Pictures have been used in studies as rewards. One of the most commonly used method of utilizing pictures as reinforcement involves using stickers to increase desired behaviors in children. In a study conducted by Allen and Stokes (1987), five 3 through 6 year old children who were afraid of the dentist were given stickers as rewards for listening and viewing dental tools in a controlled setting. The children's baseline levels of anxiety decreased from 90% to less than 15% by the final treatment session. Another study that used stickers to increase a positive behavior was conducted by Roberts and Broadbent (1989). In this study, day care providers handed out stickers to children who came to day care in compliance with seatbelt laws. Results of this study showed that the baseline rate of 37.7% increased to 86.2% when stickers were presented. A 1994 study by Hyland and Keaton also used stickers as reinforcement. This study focused on changing the off-task behaviors of 32 sixth grade students. The teacher graphed the frequency of each student's off-task behavior daily while the student did the same. If both the teacher and student had comparable graphs, the student received a sticker as a reward. In all but one case, on-task behaviors increased.

Stickers are not the only type of pictures that have been used as reinforcement to increase behaviors. In a study conducted by Gross and Shapiro (1981), five second-grade students diagnosed with LD participated in a study to improve spelling test performance. Students who had at least 80% correct on a weekly spelling test had their picture posted in the classroom as a reward. During the baseline condition, the mean for correct answers was 45%. After the picture reinforcement was implemented, the classroom mean rose to 75% correct. In another study, cartoon pictures were utilized as reinforcement (Aase &

Sagnolden, 2006). This study focused on changing deviant behaviors in children diagnosed with ADHD. A total of 56 boys ages 6 to 12 participated. Twenty-eight of the boys were diagnosed with ADHD, while the others had no diagnoses. Each participant was asked to complete a computerized task, which required clicking the mouse in one of two squares on the screen. Variable interval schedules of 2 seconds or 20 seconds were used to determine reinforcement rates. Results indicated that when the participants received pictorial reinforcement every 2 seconds, both the children with ADHD and those with no disabilities sustained the same amount of attention. When the variable interval schedule was 20 seconds, the children diagnosed with ADHD had more problems on the activity because of impulsiveness, sustaining attention, or response variability than those who were not diagnosed with ADHD.

Reinforcement surveys. For interventions that use positive reinforcement it is important to note that in order for this type of intervention to be effective the participants must be presented with something that is reinforcing to them individually. A study by Daly et al. (1984) showed that teachers are unable to accurately predict what students will chose as reinforcers. The researchers in this study investigated the extent to which teachers and students agreed on what is most likely reinforcing to the student. The Children's Reinforcement Survey Schedule was used to determine what would be reinforcing (Cautela & Brion-Meisels, 1979). This 80-item scale was developed for use with fourth through sixth grade students to determine the students' reinforcement selections, as well as what the teachers would select as reinforcing for each student. Participants in this study included 49 students, ranging in age from 10 to 14 years, from both the fifth and sixth grades. Additionally, 20 teachers participated. Results of this

study showed that agreement between students' reinforcement selections and teachers' selections for students ranged in correlation from .01 to .61 depending on the student-teacher dyad. When the correlations from all teacher-student dyads were averaged, the overall mean correlation was .32. Hence, on average teachers were only moderately able to predict student selected reinforcers and in some situations teachers were unable to identify reinforcers for students. Daly et al. also suggested that teachers were better at predicting items that would reinforce girls as a group compared to boys. This may be due to 95% of the teachers being female. Research findings also suggested that teachers selected items that were easily available to them in the classroom instead of outside reinforcers. Overall, results of this study showed that students need to have an active role in selecting reinforcers for behavioral interventions.

Homework Completion

According to teachers, homework is an essential part of the academic process. Homework can best be defined as tasks assigned to students by teachers that are meant to be performed during non-school hours (Cooper, 1989). Because homework is done outside of the educational environment, homework completion rates are often a major concern of teachers. Homework completion can be defined as a student turning in an assignment the following school day with a large percentage of the problems completed either correctly or partially correct (Hinton & Kern, 1999). In Cooper, Lindsay, Nye, and Greathouse's (1998) study of 709 general education students with no disabilities, 75% of parents reported that their child completed all homework assigned, compared to 65% of students who said they completed all of their assigned homework.

In a meta-analysis conducted by Cooper (1989), it was found that an average high school student who did his or her homework outperformed 75% of the students who did not do homework. Cooper also found that students in middle school who completed homework achieved higher grades than approximately 38% of students who did not complete homework. In addition to these findings, a positive correlation was found between time spent on homework and achievement. To illustrate this, of the 50 studies reviewed in Cooper's meta-analysis, 43 indicated that students who spent more time on homework had higher achievement levels, as compared to 7 studies that showed the opposite. One important factor Cooper noted was the interaction of grade-level, with students in upper grades having higher correlations between homework and achievement (Keith et al., 1993).

Homework Completion and Students in Restrictive Classroom Environments

Many students in restrictive classroom environments have problems completing homework, hence their academic achievement suffers. It has been found that time spent on homework impacts achievement because it increases the students' "time on task" (Trautwein et al., 2001). When investigating homework issues, many of the problems students with ED in restrictive classroom environments have may stem from the fact that 25% of students with ED also have a comorbid diagnosis of a LD, and 66% of students with ED have a comorbid diagnosis of ADHD (Wagner et al., 2005). However, students with only an ED diagnosis have been shown to have achievement scores equal to their peers with LD or ADHD diagnoses in multiple academic areas (Lopez, Forness, MacMillan, Bocian, & Gresham, 1996).

According to Bryan and Burstein (2004), students with an ED or LD diagnosis have similar homework completion problems due to two primary causes, individual student characteristics and poor construction of assignments by teachers (Epstein, Polloway, Foley, & Patton, 1993). The broad area of individual student characteristics can be broken down into three main characteristics: lack of motivation, listening comprehension deficits, and organizational deficits. The foremost characteristic is a lack of motivation. Students with ED or LD are unlikely to take action on a task without consistent and obtrusive direction. Without motivation to complete assignments and disregard for grades, students with ED or LD are motivationally different from their peers without disabilities (Landrum et al., 2003). Additionally, the ED population and some students with LD tend to have problems with listening comprehension. In comparison to students who are not diagnosed with a disability, students with ED have more difficulty understanding spoken language. When someone has a deficit in this area he or she may have a challenging time completing tasks when directions are given orally, and may have difficulty reading directions or passages because listening comprehension and reading comprehension are highly correlated (Duker, 1965).

Lastly, Bryan and Burstein (2004) stated that poor organizational skills tend to be a deficit of both students with ED and LD and is one of the main reasons why homework completion rates are lower for these groups than average students. Past researchers have defined organization as the process and behaviors that are required for task completion (Zentall, Harper, & Stormont-Spurgin, 1993). Included in this definition are three abilities that one must have to be organized. One must have the ability to plan and manage activities within a time frame. This skill is essential in completing assignments at

home when not on a strict schedule like the classroom setting provides. In addition, for rapid retrieval one must have the ability to systematically position objects and assignments within space. If one does not have this ability it is easy for homework assignments to become misplaced and easily forgotten. Also, to be organized one must be able to structure an approach to a task, which means one must be able to determine which assignment to do first and decide on a specific approach to how the assignment should be completed. For most students without organizational problems taking work home and back to school does not require a second thought, whereas for students with ED and LD, organizational skills tend to be a weakness and this transportation can be problematic.

Extensive deficits in motivation, problems in listening comprehension, and lack of organizational skills leave students with ED and LD behind in areas that are truly important for academic success. These skills are needed in transporting work home, taking time to accurately complete the assignment, and then returning it to school the next day. Given these findings, it is not surprising that homework completion rates are lower in the student population found in restrictive classroom environments than for students without disabilities.

Another primary cause that leads students with ED or LD to have difficulties with homework completion, according to Bryan and Burstein (2004), is poor construction of assignments by teachers. This can include assignments being too long, directions being unclear, and homework problems that are too difficult for students to complete on their own. Using parent and teacher data, Epstein et al. (1993) determined that adults saw common characteristics in students with ED that may contribute to their lack of homework completion. The characteristics were procrastination, forgetfulness, needing

someone in the room, daydreaming, and being easily distracted. These problems not only lead to students with ED being unsuccessful in completing homework, but also in returning work to the classroom.

Research suggests that students with higher homework completion rates tend to be from families that value homework and take an active role in their child's education. For one category of students in restrictive classroom environments, those diagnosed with ED, parental involvement is extremely limited due to several risk factors. These risk factors include: 33% of students with ED are from a single parent home, 20% of all students with ED live in homes where the head of the household is unemployed and not a high school graduate, and the majority of students with ED live in a household that is under economic stress (Wagner et al., 2005).

Similarly, risk factors for not completing homework exist for the LD population. A study by Gajria and Salend (1995) found that students diagnosed with LD have less motivation and require more prompts to begin working and to continue working than their peers without disabilities. Because homework is completed in the student's home environment, which may contain little structure and supervision, the student with LD may go off task easily. Results of this study also indicated that students who are diagnosed with LD suffer from higher rates of depression than their same age peers without disabilities. Students who suffer from clinically significant levels of depression are less likely to complete assignments outside of class due to feeling exhausted, having problems thinking clearly, and having little confidence in their abilities. Students with LD also show more signs of anxiety when presented with academic materials. Students who suffer

from anxiety at a clinically significant level may avoid homework due to the adverse feelings associated with it.

Current Homework Completion Interventions

As a means of increasing overall academic achievement, many different interventions have been implemented to raise homework completion rates of students in general. Few of these have been tried with students in restrictive classroom environments. Many of these interventions fall within one of four categories: interventions that use positive reinforcement, those that change the format of assignments, interventions that involve parent participation at home, and interventions that combine two of the above techniques (Olympia et al., 1994). Each type of intervention has its own positive attributes and selecting what type of intervention to implement may be a difficult task for teachers, particularly those who teach students in restrictive classroom environments.

Positive reinforcement. Interventions that focus on using positive reinforcement as their main tactic to increase homework completion rates have been shown to be effective if the correct reinforcers for the student are in place. For a reinforcer to be effective, it has to increase the likelihood that a behavior will occur again in the future (Homme, Casany, Gonzales, & Recks, 1970). In this case, when a homework assignment is completed by a student that student must receive reinforcement in order to be more likely to complete homework again.

Moore et al. (1994) implemented a Mystery Motivator intervention as a way to increase homework completion rates. In this study nine third and fourth grade boys from two different regular education classrooms participated. Teachers constructed a weekly board using invisible ink markers. When students turned in 100% of their weekly

assignments, they were able to color in a square on the weekly board. If their square showed the mystery motivator symbol they could select a prize from the reinforcement menu. The reinforcement menu was a selection of rewards based on results of a reinforcement survey given to the students by the teacher. In both grade levels homework completion rates increased. In one classroom, completion rates increased from 64.9% to 89.4%, and in the other classroom completion rates increased from 70.1% to 80.8%. An additional finding showed that homework accuracy rates also increased from 56.6% to 81.2% and 52.1% to 65.1% respectively, although accuracy rates were not directly targeted.

Another intervention that used positive reinforcement to increase homework completion rates was conducted by Olympia et al. (1994). In this study, 16 sixth grade regular education students who met the following criteria participated: completed less than 50% of the homework assigned or had less than 50% correct on assignments, earned an unsatisfactory grade in the last grading period, and scored in the lower 50^{th} percentile on a group achievement test. Students attended two training sessions regarding roles and responsibilities of self-management. They were then split into two groups. Students in one group selected their own homework completion goal, while the other group's goal was selected by the teacher. For both groups, positive reinforcement was contingent upon group attainment of the goal. Homework completion rate was assessed by counting the number of days per condition that assignments were turned in, while accuracy was determined by counting the number of problems correct out of the total number on the worksheet. A single subject reversal design in which two baseline and two treatment conditions were alternated every two weeks was used. Results indicated homework

completion rates increased for 14 of the 16 participants. The group that set its own goal chose a goal lower than the teacher's goal approximately 70% of the time. This group's rate of reinforcement was approximately 54%, while the teacher selected goal group only received reinforcement 26.6%. Overall, students who received more reinforcement for their homework completion turned in more assignments.

Homework modifications. Another broad area of homework interventions deals with changing the format of assignments. This can be accomplished by teachers in many different ways including changing the layout of assignments or changing the types of questions asked. Due to students with ED, LD, and OHI being less likely to engage in academic behaviors, such as completing in-seat work and homework assignments, it is important to utilize interventions that will not decrease the amount of work required by these students (Slate & Saudargas, 1986). To address this problem Teeple and Skinner (2004) investigated an intervention based on a principle set forth by Herrnstein (1961), which states that competing behaviors offer different levels of reinforcement, and based on those levels choice behavior can be predicted. This principle was studied among 32 students' ages 12 to 17 years with emotional and behavioral disorders (EBD). In this study, students completed two assignments that were formatted differently. One of the assignments contained three paragraphs per page and students were instructed to rewrite and use correct punctuation; the other assignment was similar except in addition to the three paragraphs it contained one or two one-sentence paragraphs interspersed on each page. Assignments were scored based on the total number of items completed, the number of target items completed, and the percentage of copied sentences accurately punctuated. Results of this study showed that more students with EBD chose the

assignment with the interspersed brief paragraphs as their preferred assignment. This supported the researchers' hypothesis that students would select homework assignments that offered discrete interspersed tasks allowing for self-reinforcement. This type of intervention resulted in the students with EBD choosing to engage in more assigned work.

Parental involvement. Another area of homework completion interventions involves incorporating parental support into homework time. Bryan and Sullivan-Burstein (1998) conducted a study in which both parental involvement and organization were targeted to increase homework completion rates. In this study, 39 first through fourth grade students with LD participated. Each student was given a homework planner to write down assignments, while parents were sent a letter informing them that teachers would encourage parental signatures on homework and parents had an option to send messages via the student planner to teachers daily. Homework completion rates were assessed by dividing the number of completed assignments by the number of assignments each student received. Results indicated that after children were given planners, they completed more homework than they did the previous year. Teachers agreed that the homework planners increased parental involvement and allowed teachers to receive feedback from parents.

Callahan, Rademacher, and Hildreth (1998) also conducted a study that involved parents in increasing homework completion rates. The study focused on seventh and eighth grade students who were considered "at risk" due to academic, social, or behavioral deficits. Parents of each of the participants attended two training sessions, which included listening to presentations, receiving self-management materials,

practicing role playing techniques, and completing a homework attitudes questionnaire. Students also received training in self-management techniques. After training was completed, each student and parent independently filled out a self-management worksheet and the student completed his or her homework. Once homework was completed, the student and parent compared worksheets to determine accuracy. A single subject reversal design was used to structure this study. During the two baseline conditions students received no reinforcement. During the two treatment conditions students earned points for accurate self-monitoring. The points could be used towards purchasing an item from a reinforcement menu. Homework assignments were considered complete if they were turned in to the teacher, while accuracy of assignments was measured by the percentage of math problems completed correctly. A baseline measure indicated that students completed only 33.2% of assignments prior to intervention. Results of this study indicated that students whose parents complied with all procedures presented during the parent training showed success with the intervention. To show a high level of success (95% completion), parents had to participate 80% of the time or more, which proved to be true for only 9 of the 26 student-parent dyads. Parents who participated moderately, which was defined as 50 to 79% involvement, had students with less positive results (72% completion). Lastly, 9 parents had very low level of participation, with less than 45% compliance, and those students showed very few or no gains (45% completion).

An extension of Callahan et al.'s (1998) study was conducted in 2004 by Cancio et al. This study focused on six students diagnosed with EBD using the same process as the previous study. Homework completion rate was measured by the student turning in

the assignment the day it was due with all problems attempted, as evidenced by appropriate numerals in the answers. Overall homework completion rates increased from 2% at baseline to an average of 92% during the intervention phase. This was in light of multiple personal circumstances, such as being arrested or missing multiple days of school, that affected students during the intervention.

Intervention combinations. Using a combination of techniques to create an intervention is another way to increase homework completion rates. Bryan and Sullivan-Burstein (1998) developed an intervention focused on changing the format of assignments by incorporating students' interests, while also including reinforcement into one phase of the study. For data collection purposes, teachers divided 123 first through fourth grade students into one of four groups: students with LD and homework problems, students with LD without homework problems, average-achieving students with homework problems, and average-achieving students without homework problems. All students were given assignments that incorporated their home life into the homework. For example, students measured the area and diameter of their bedroom. The reinforcement intervention that was utilized consisted of students receiving either a tangible reward or 20-minutes of extra recess each Friday if all homework assignments were submitted for the week. Homework completion rate was assessed by dividing the number of completed assignments turned in by the number of assignments that students received. This method was used so that homework completion rates of students who missed class would not be influenced by assignments they did not receive.

Results of this investigation showed that average-achieving students scored higher on both math and spelling homework than those diagnosed with LD. Overall, students

who were considered average-achieving but had homework completion problems and students with LD who did and did not have homework problems benefited from this intervention. Another interesting finding showed that students with LD made greater gains on math homework than spelling homework. Although completion rates increased when students' interests were incorporated into assignments, it was found that students' compliance with homework completion increased most when both reinforcement and real life assignments were implemented. It should be noted that some students were unresponsive to the intervention and teachers expressed the desire to tailor interventions for individual students instead of using the same intervention for the whole class.

Another example of incorporating two techniques into a homework completion intervention was conducted by Hinton and Kern (1999). This study was based on the idea that if one alters the reinforcement value of a nonpreferred activity by including students' interests, students will be more likely to partake in the activity. Twenty-two fifth grade students who were in general education participated in this study. Three nights a week, a homework worksheet that consisted of four to five word problems was sent home. A single subject reversal design was used to evaluate the effects of the intervention. Each phase of the design lasted for one week with a total of three assignments being assigned per phase. During treatment conditions, students were told that if they completed their homework and returned it the next day their name would be added to the word problems received by the entire class for the following assignment. Homework was considered complete if it was returned the next school day with at least 75% of the problems answered. Homework completion rates increased from 59% in the baseline condition to 96% the first time the treatment was implemented. A second baseline condition resulted

in a decrease in homework completion rates to a level of 61% and in the second intervention phase, rates increased to an average of 93%. This intervention increased student homework completion rates by modifying homework to include student names as reinforcement for previous completion.

Purpose of the Study and Research Questions

Many interventions for homework completion have been implemented in the school system but student populations in restrictive classroom environments are rarely targeted. Many researchers who have tried to increase homework completion rates utilize either general education classrooms or focus on students with LD. Although this research is important and may generalize to other classrooms, students in restrictive classroom environments have characteristics that are different than most students in general education. These different characteristics are what make implementing an intervention specifically for students in a restrictive classroom environment important.

An area that shows marked differences between general education students and students with ED is parental involvement in academics (Wagner et al., 2005). There has been a recent movement in the general education literature to increase the amount of parent participation in interventions focused on homework completion rates (Callahan et al., 1998; Cooper et al., 1998; Cooper & Nye, 1994). Although some parents may cooperate with home interventions, it has been noted that low-income families, along with ethnic minority families, are the least likely to volunteer to be involved in homework interventions. Wagner et al. points out that this information is particularly important when determining what type of intervention to conduct with students with ED given that a large percentage of these students' families fall into one of the risk factor

categories. Moreover, Kazdin (1975) stated that when including parents in interventions that are focused on changing behavior, there can be many additional drawbacks. These drawbacks include parents having difficulty staying consistent with rewards and consequences, parents having difficulty reliably and objectively observing behavior, and students developing a negative association between their parents and negative contingencies. For an intervention involving a restrictive classroom, an intervention that relies much more on students' interests and positive reinforcement to increase homework completion rates may be more successful.

According to Hinton and Kern (1999), an intervention that focuses on slight modifications to homework worksheets, without decreasing academic engaged time, is needed. In addition, the operant conditioning principle of positive reinforcement should be incorporated into the intervention to increase the likelihood that homework will be completed again in the future (Pierce & Cheney, 2004). When implementing operant conditioning in a study, it is important to ensure that the participant is reinforced by the selected reinforcer. As in the 1994 study conducted by Moore et al., a reinforcement survey should be conducted to determine what each student finds reinforcing. Because research has shown that many teachers have problems identifying reinforcers for students (Daly et al., 1984), the current study utilized a reinforcement survey to determine students' interests, which was used to develop pictorial reinforcement.

The present study incorporated single subject reversal design methodology following the pattern used by Hinton and Kern (1999). The investigation had four phases, two baseline and two treatment. Each phase lasted a total of eight school days. In addition, on the last day of both baseline phases and on all days of the treatment

condition phases, except the final day, the classroom teacher informed the students that a reward would be given on the next homework assignment to those who turned in their work the following school day.

After each student returned his or her homework to the classroom teacher, the researcher checked completion and accuracy. These areas were divided and reviewed separately so that students would be reinforced for the submission of their assignment and not just for accuracy. According to a study conducted by Bryan et al. (2001) students with LD expressed that they felt they should be rewarded for completing homework regardless of their accuracy. Homework was considered submitted if it was returned to the classroom teacher the following school day the child was present (Bryan & Sullivan-Burstein, 1998). Homework completion rates were calculated by determining the number of problems attempted divided by the number of total problems. Homework accuracy was then measured by computing the percentage of problems correct for each assignment (Callahan et al., 1998).

The overall purpose of this study was to test the use of a pictorial reinforcement intervention designed to increase homework submission, completion, and accuracy rates of students in a restrictive classroom environment. All reinforcement pictures were individually determined by exploring students' favorite interests that were identified using a reinforcement survey. The following research questions guided this study:

1. What is the pattern of homework submission for each middle school student in a restrictive classroom environment?

2. Does individualized pictorial reinforcement, based on a reinforcement survey, increase homework submission rates of students in a middle school restrictive classroom?
3. What is the pattern of homework completion for each middle school student in a restrictive classroom environment?
4. Does individualized pictorial reinforcement, based on a reinforcement survey, increase homework completion rates of students in a middle school restrictive classroom?
5. What is the pattern of homework accuracy for each middle school student in a restrictive classroom environment?
6. Does individualized pictorial reinforcement, based on a reinforcement survey, increase homework accuracy of students in a middle school restrictive classroom?
7. What categories of reinforcement do students in a restrictive classroom environment say are the most reinforcing?

Chapter 2

METHOD

Participants

Participants were recruited from a large, Midwestern middle school. Permission was obtained from the school's administrator and the special education teacher to conduct the study in the school. Additionally, parents were asked permission for their child to participate (see Appendix A). A total of 12 students received permission forms, however only 7 were returned. Only one guardian indicated that her student was not to participate in the study. Each student was also asked to give assent to participate (see Appendix B).

Six Caucasian students, four of which were male and two female, ranging in age from 12 to 14 ($M = 13$, $SD = .89$) participated in this study. Two of the students were in the sixth grade, 3 were in the seventh grade, and 1 participant was in the eighth grade. Criteria for inclusion were the student spending at least one class period of the school day in a restrictive classroom environment and having an individualized education plan (IEP). Four students were receiving special education services for a Learning Disability, one student was receiving services for an Emotional Disability, one was receiving services because of an Other Health Impairment.

From information obtained through the reinforcement survey, it was determined that all of the students' parents or guardians worked full-time. Also according to the participants, four of the students lived with a single parent, while one lived with parents, and one student resided in foster care. Two students also indicated that at least one of their parents graduated from high school as their highest level of education, while two students stated that their parents or guardian had graduated from college. Two of the students were unsure of their parents' highest level of education.

Materials

Reinforcement Survey

The reinforcement survey, which was developed for this study, consisted of a total of 20 questions. Five questions focused on demographic information, including age, grade, whom the participant lived with, highest education level of parent(s) or guardian, and work status of parent(s) living in the home. Fifteen questions were used to obtain information regarding some of the participants' potential favorite reinforcers (see Appendix C). These questions focused on colors, sports, animals, food/drinks, music, movies, video games, and television.

Number Randomization Software

Number randomization software was used to determine which pictorial reinforcement would be added to individual worksheets. The free of charge software was obtained over the internet from randomnumbers.info, which is hosted by the University of Geneva and id Quantique, a company specializing in number randomization (id Quitique, 2006). Random numbers, which cannot be subsequently reliably reproduced, were used because they are generated by a process whose result is unpredictable.

Homework Worksheets

Homework assignments were based on previously learned material that had been covered through classroom instruction. All homework problems were math related throughout the study. The researcher prepared a cover sheet that was stapled to the front of the homework worksheets every day throughout all phases. The cover sheet was a white 8-½ inch by 11 inch piece of paper, which displayed the student's first and last name and the date in the upper left hand corner. Additionally, when reinforcement was earned during the intervention phases, the cover sheet displayed a picture of a reinforcer that was based on results of the reinforcement survey (see Appendix D for an example). During the baseline conditions and when reinforcement was not earned during treatment conditions, the portion of the cover page that held the picture was left blank (see Appendix E). The picture used on each student's assignment was selected randomly using the number randomization software from the University of Geneva and id Quantique.

Reinforcement Pictures

All reinforcement pictures were obtained by copying and pasting directly from the internet or Microsoft Word's clip art. Pictures covered no more than 50% of the cover page. Pictures were in color or black and white depending on availability. All pictures were pre-approved by the classroom teacher before they were utilized in this study.

Procedures

Parental Permission

Parents or guardians of participants received consent forms that provided them with details of the study. Consent forms were first sent home with each student

requesting that they be signed and then returned to class with the student. Two weeks later, consent forms were again sent home with students who failed to return the forms. Due to the extremely low return rate, the researcher provided the classroom teacher with consent forms and envelopes to be sent home via mail. Finally, any parents who did not return a consent form indicating their child's approved or declined participation received a telephone call from the classroom teacher. Parents were informed of their right to decline their child's participation in the study, as well as their right to withdraw their child from the study at any point in time during the investigation with no adverse consequences (see Appendix A). Of the seven returned parent permission forms, only one guardian indicated that she preferred her student not participate in the research study. This student, along with the other five students who did not return their parent permission forms, were given assignments with standard cover sheets attached. When these students completed their homework a standard picture of the school's mascot was attached to the cover page in order to ensure the child was not stigmatized for not participating in the study.

Data Collection

Reinforcement survey administration. Administration of the reinforcement surveys was standardized for all participants. The researcher arrived in the classroom at the beginning of the class period to interview each child. The interviews took place in a meeting room close to the classroom and lasted no longer than 10 minutes. Prior to beginning the survey, the student was told by the researcher what the general purpose of this study was, that his or her parent indicated it was OK for him or her to work with the researcher, that it was up to him or her to determine if he or she would like to continue

working with the researcher, and that he or she could end their participation in this study at any point in time. Each student was then asked if he or she agreed to participate. All students indicated that they would like to participate. Each participant was asked the questions from the reinforcement survey in a structured interview format. All answers were recorded on the survey and kept by the researcher to be used when creating homework worksheets. After all questions had been answered the student was escorted back to the classroom.

Homework assignments. The classroom teacher prepared math homework assignments for each day of the study. The teacher was then provided with a packet that included a cover page for each student's assignment, as well as written instructions for passing out homework (see Appendix F). The directions stated that students were to complete homework assignments at home and return them to school the following day. If the student was sick or unable to attend school the homework was due the day he or she returned. The teacher was also instructed to collect the homework at the normal time during the instructional day.

Treatment integrity. Treatment integrity was evaluated randomly for 20% of the homework administrations per phase. Treatment integrity was calculated by summing the number of correct administrations, as indicated by the teacher verbally stating the directions for the homework which were supplied by the researcher, and dividing that numeral by the number of times the teacher was observed (see Appendix G). Additionally, treatment integrity was evaluated to determine the accuracy of the teacher attaching the correct cover sheet to each student's homework assignment. This was done by having the researcher check which cover sheet was left after homework assignments

had been dispersed to students during the intervention phases. Treatment integrity for correct administration was 87.5%, while treatment integrity for correct attachment of cover page was 100%. Both areas of treatment integrity superseded the 85% criteria and are considered acceptable.

Interobserver agreement. Interobserver agreement was analyzed by comparing teacher and researcher scores for accuracy of answers that students submitted on their homework. This was done for 10% of all the homework worksheets to determine homework accuracy rates of those assignments. The percentage of agreement was then calculated by taking the number of agreements divided by the number of agreements plus disagreements and then multiplying by 100. Interobserver agreement was at 100%, which superseded the set requirement of 80% and is considered acceptable (Kazdin, 1982).

Single Subject Reversal Design

A single subject reversal design was used for this study. There were two baseline phases when homework was assigned without pictorial reinforcement, and two treatment conditions in which pictorial reinforcement was used if the student met the homework submission criterion.

Baseline phases. Participants were given homework and a cover page without pictorial reinforcement and asked to return the homework the following day (see Appendix E). Data were collected on each participant for a total of eight school days. For the second baseline phase, which occurred after the first intervention phase, the intervention was withdrawn leaving the students with homework worksheets with no reinforcement pictures. Again, data were collected on each participant for a total of eight school days.

Intervention phases. The pictorial reinforcement phases were implemented for eight school days after each baseline phase. On the last day of baseline data collection, students were informed that if they completed their homework assignment and returned it the next day, they would receive a reward on the next assignment. The teacher repeated these directions every day, except for the last day of the treatment conditions. Each participant was given a homework worksheet the following day with a cover sheet with pictorial reinforcement or no pictorial reinforcement based whether he or she submitted the previous assignment (see Appendix D).

Chapter 3

RESULTS

Homework Submission

Visual Analysis

Visual analyses were conducted to assess homework submission rates of the six participants in this study. Data were collected in four phases with eight homework assignments possible in each phase. Homework in all phases was considered submitted only when it was handed in to the classroom teacher the next school day the student was in attendance (Bryan & Sullivan-Burstein, 1998). Homework submission was recorded using a checkmark to indicate that the assignment was received on time. Homework submission rates for each phase were calculated by summing the number of assignments submitted by all students and dividing by the total number of assignments possible for the group and multiplying by 100 to obtain a percentage. Also, the average number of homework assignments submitted for each phase was determined by summing the number of assignments all students submitted during each phase and dividing by the number of students participating in the study. The overall homework submission rate during the first baseline phase was 46%. The average number of assignments submitted during the baseline one phase was 3.66 (SD = 3.50) with a range of 0 to 8 assignments

out of the possible 8 assignments. During the first intervention phase, 23% of the possible homework assignments were submitted. The average number of assignments submitted decreased to 1.83 (*SD* = 0.98) with a range of 1 to 3 assignments per student in the first intervention phase. During the second baseline condition, 67% of all possible assignments were submitted with an average of 5.33 (*SD* = 2.73) and a range of 0 to 7 assignments per student. During the final intervention phase, 50% of all possible assignments were submitted, with an average of 4.00 (*SD* = 2.00) and a range of 1 to 7 assignments submitted per student (see Figure 1).

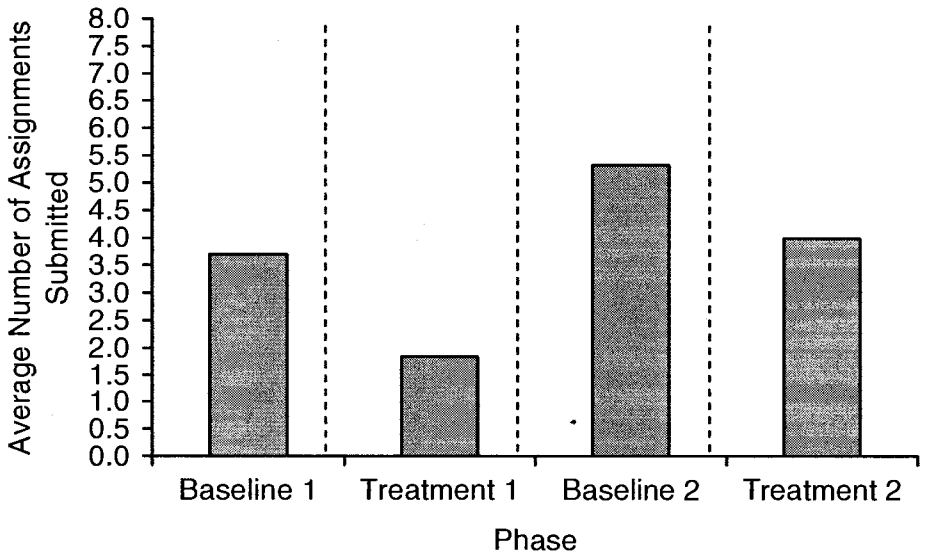


Figure 1. Average number of homework assignments submitted in each phase for all students.

When analyzing student homework submission rates by special education disability, a pattern was found. It appears that student E, who was the only student with a diagnosis of ED, submitted more homework than students in the other disability groups.

Additionally, the four students with a LD disability diagnosis, as well as the one student diagnosed with OHI, appeared to have submitted more homework assignments during the last two phases of the study as compared to the first two phases. When looking at these students individually, student A submitted the most assignments during baseline condition one as compared to student B who submitted one homework assignment during each of the treatment conditions as compared to zero during the baseline conditions (see Figure 2). The final two students with a diagnosis of LD, students C and D, submitted the largest number of homework assignments during the baseline two condition. The only student in the OHI category, student F, submitted the largest number of homework assignments during the baseline two condition. Finally, all disability groups showed relatively low homework submission rates during treatment condition one (see Figure 3). Overall, more homework was submitted during the final two phases of the study as compared to the first two phases.

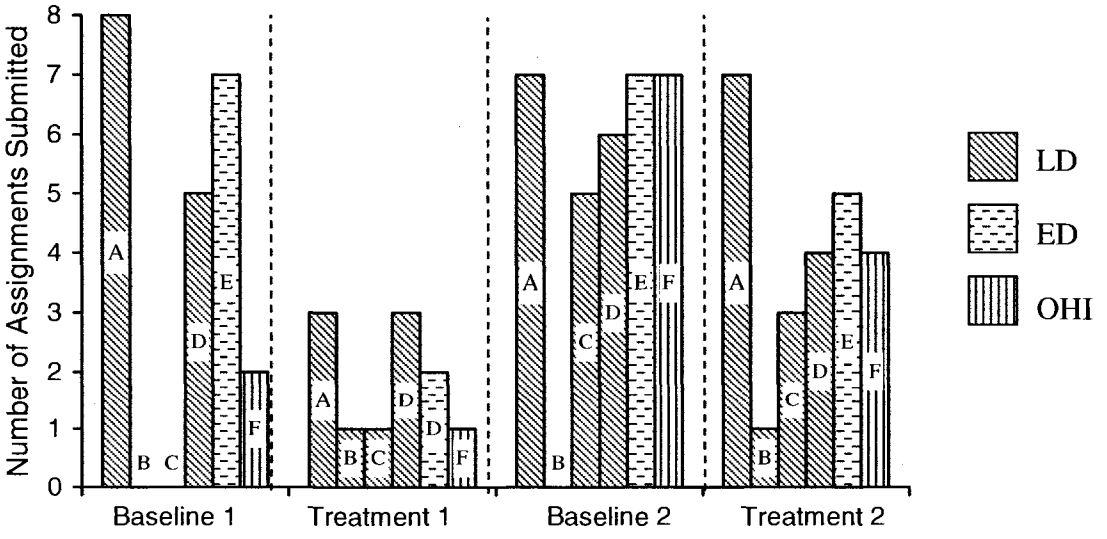


Figure 2. Number of homework assignments submitted by each student per phase.

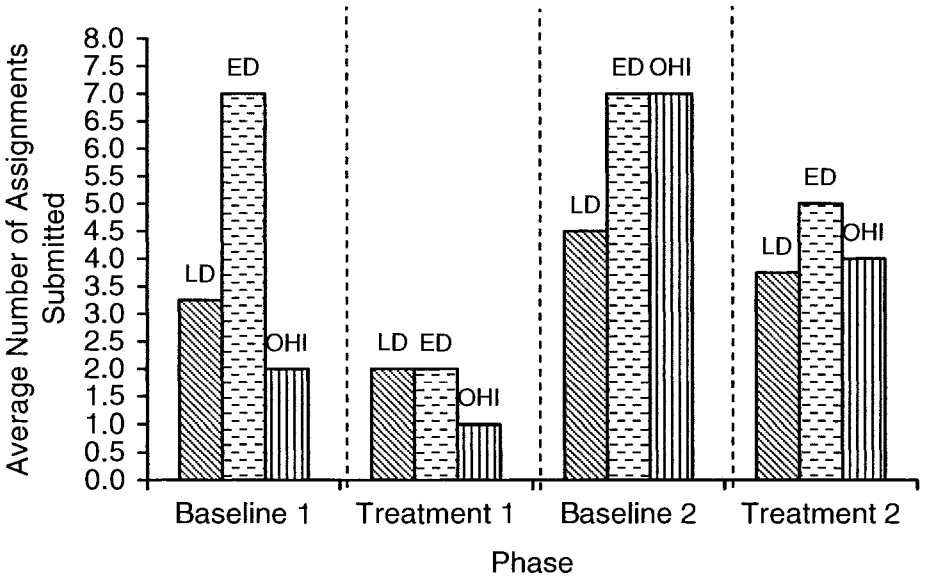


Figure 3. Average number of homework assignments submitted in each phase by special education disability.

Statistical Analysis

A repeated measures ANOVA was conducted to examine the effects of pictorial reinforcement on the number of homework assignments submitted. The independent variable was phase, which had four levels: baseline one, treatment one, baseline two, treatment two. The dependent variable was the number of homework assignments submitted. There was a statistically significant difference in the number of assignments submitted by each student among the four phases when using the Greenhouse-Geisser adjusted F-test, $F(2.15,10.73) = 5.23$, $p = .024$, $\eta^2 = .51$. Post hoc comparisons using Tukey's HSD were conducted. Results indicated that students submitted significantly more homework assignments during the baseline two condition than the treatment one condition. No other significant differences were found (see Table 1).

Table 1

Descriptive Statistics for Homework Submission by Phase (N = 6)

	M	*SD*	Range
Baseline 1	3.67	3.50	0 to 8
Treatment 1	1.83	.98	1 to 3
Baseline 2	5.33	2.73	0 to 7
Treatment 2	4.00	3.00	1 to 7

Homework Completion

Visual Analysis

Visual analyses were conducted to determine if pictorial reinforcement from a reinforcement survey increased homework completion rates of students. To obtain the overall homework completion rate for all students in each phase, the number of attempted homework problems for the entire sample was calculated. Problems were considered attempted if there were any pencil or pen response near the problem. Table 2 indicates the number of homework problems possible for each assignment. If a student did not submit an assignment, he or she received a zero for completion. The result was then divided by the total number of problems available and multiplied by 100 to obtain a percentage. For the six students who participated in this study, the overall percentage of homework problems that were attempted during the first baseline phase was 44%. The average percentage of homework problems attempted decreased in the first intervention phase to 22%. The percentage of homework problems attempted then increased in the second

baseline phase to 62%. The final treatment phase resulted in an attempted homework rate of 48% (see Figure 4).

Table 2

Number of Homework Problems Possible for Each Homework Assignment

Assignment	Baseline 1	Treatment 1	Baseline 2	Treatment 2
1	20	11	30	3
2	18	3	24	20
3	26	20	20	12
4	20	3	3	10
5	29	42	10	12
6	24	16	25	4
7	8	36	22	14
8	9	15	22	6
Total possible	154	146	156	81

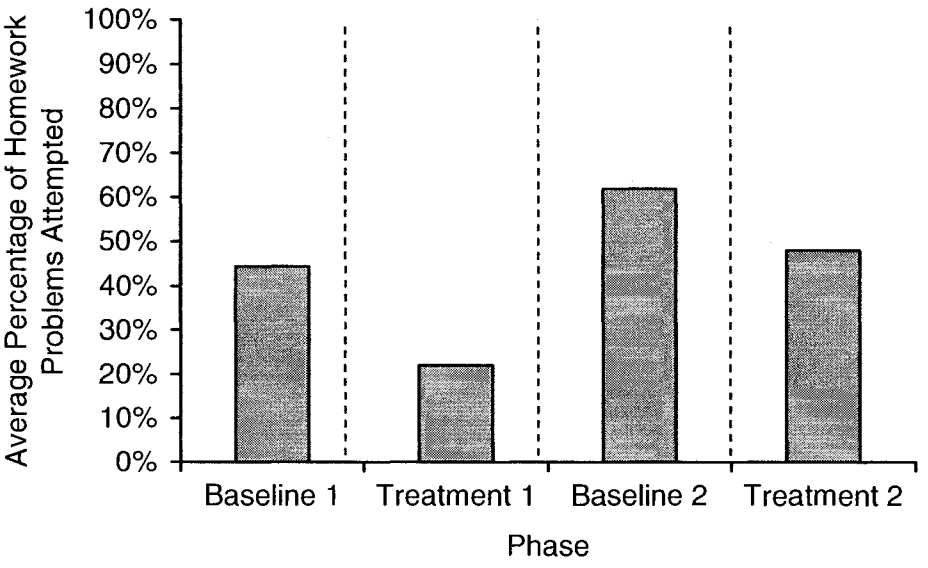


Figure 4. Average percentage of homework problems attempted in each phase for all students.

The percentage of homework problems attempted of the assignments that were actually submitted was also calculated. Of the homework assignments submitted, the number of problems attempted was summed and divided by the number of problems possible. This number was then multiplied by 100 to obtain a percentage. In the first baseline condition, when considering only submitted assignments, approximately 97% of homework problems were attempted. This number decreased slightly to 95% in the first treatment condition and decreased again in the second baseline condition to 90%. In the final treatment condition the percentage of homework problems attempted of the assignments submitted increased to 96% (see Figure 5).

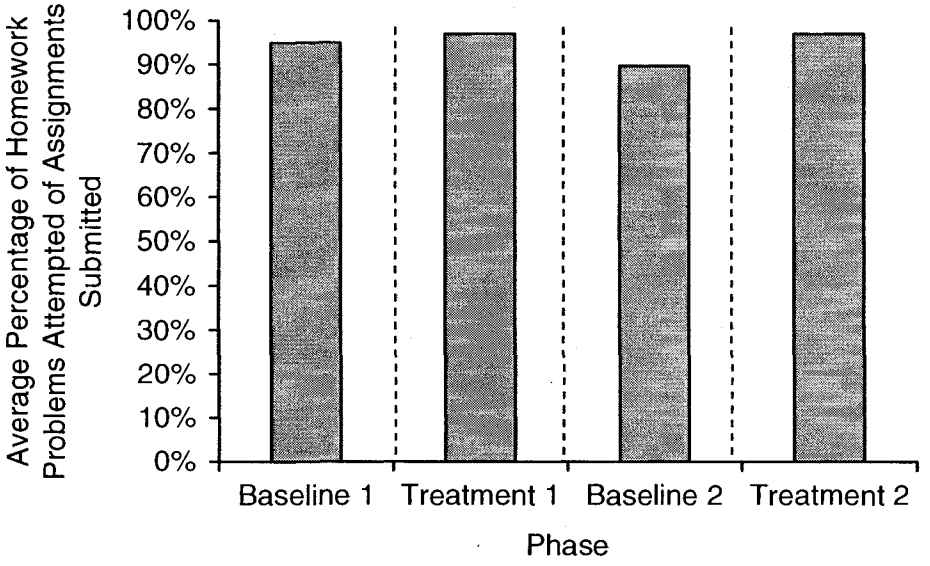


Figure 5. Average percentage of homework problems attempted of assignments actually submitted in each phase for all students.

A graphical representation of students' results by special education disability was also conducted based on data from submitted assignments (Figure 6). All disability groups showed high levels of completion when homework was submitted. The only student with an OHI diagnosis (student F) appeared to have completed slightly more homework problems during the treatment conditions, as compared to baseline conditions. When reviewing the number of problems attempted by students with LD on submitted homework only, student A attempted almost all homework problems on submitted assignments throughout the four phases. Student B, who also had a diagnosis of LD, completed more homework problems during the two baseline conditions than the treatment conditions. The final two students diagnosed with LD (students C and D) attempted more homework problems during the two treatment conditions than during the baseline conditions. No pattern was found when reviewing homework completion for the

student diagnosed with ED (student E) because he completed homework problems in an inconsistent manner throughout all phases (see Figure 7).

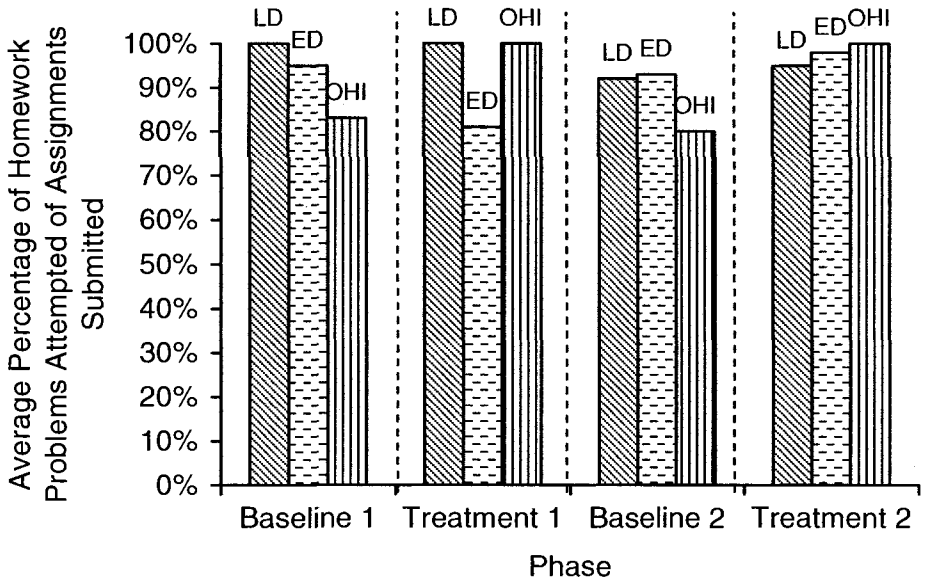
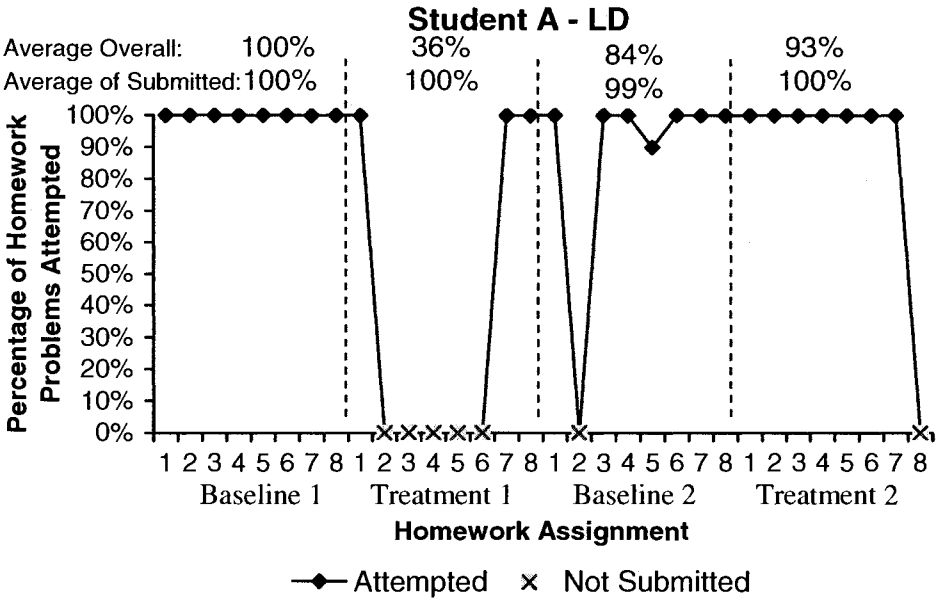
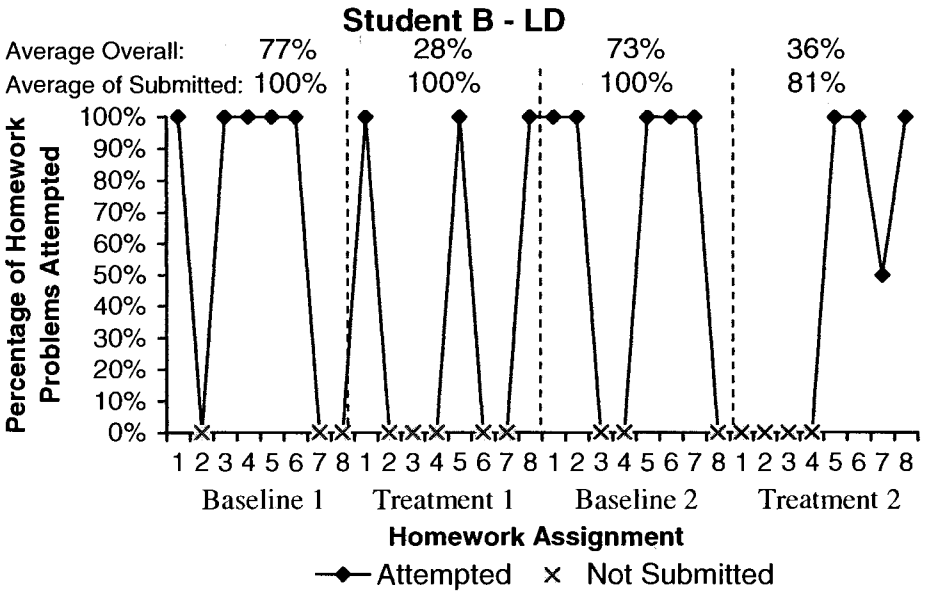
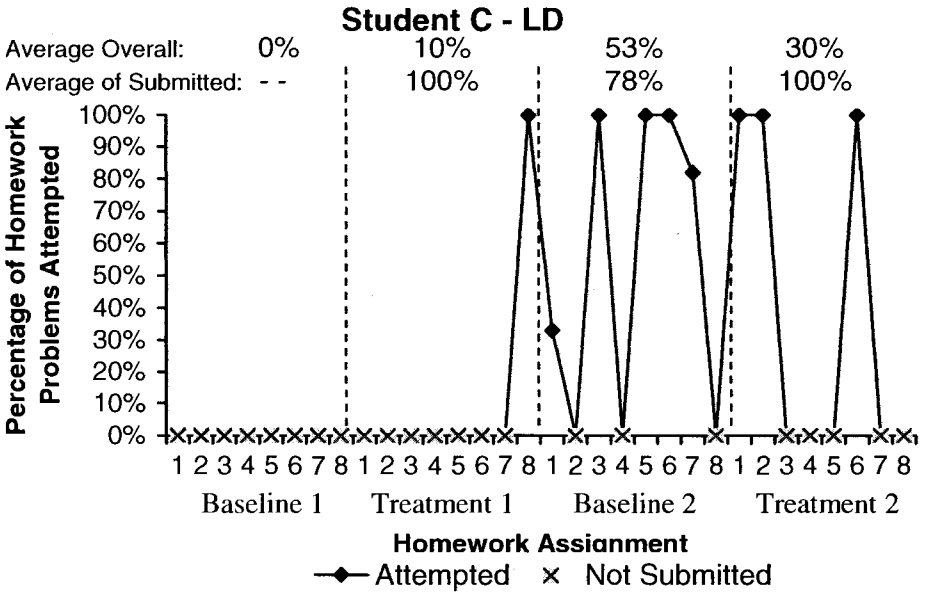
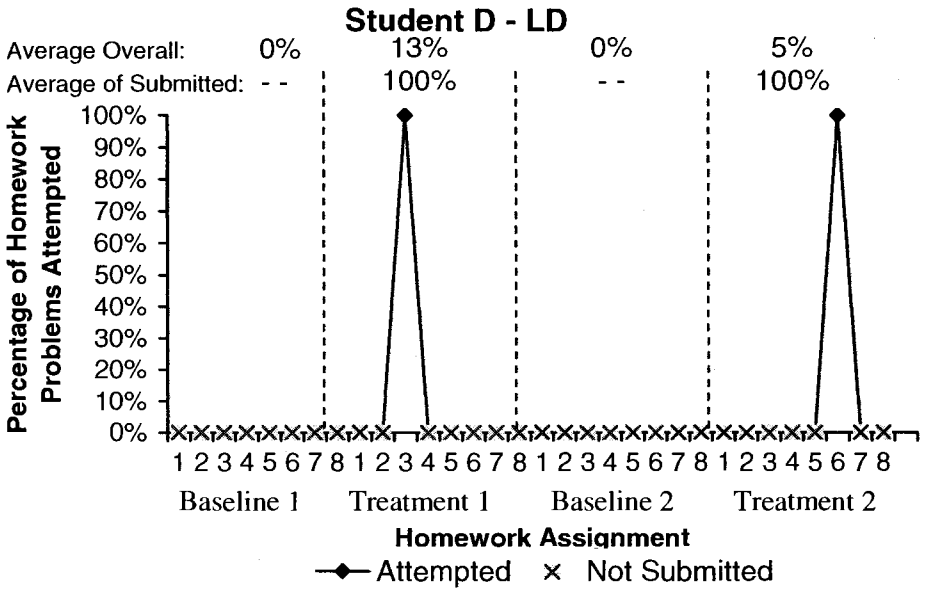


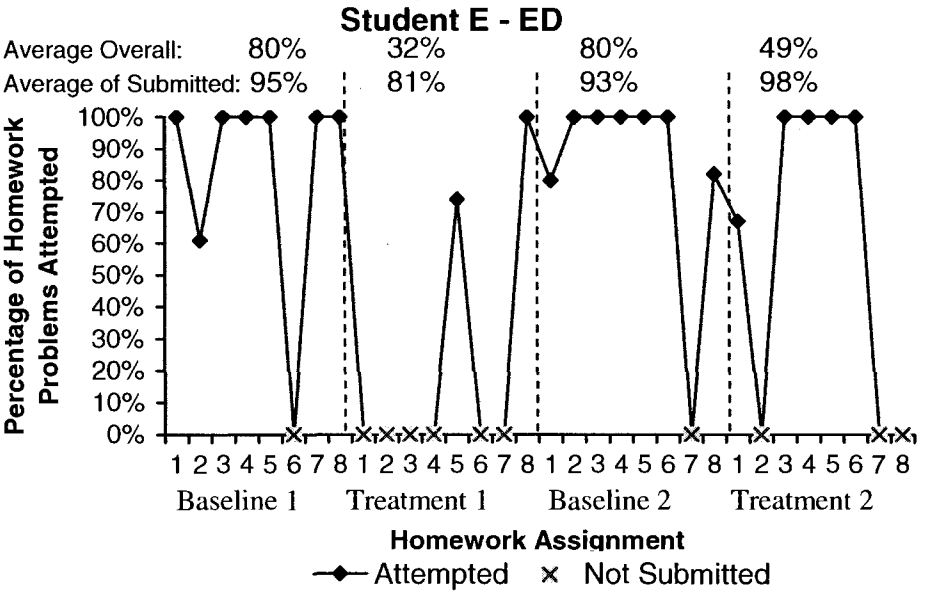
Figure 6. Average percentage of homework problems attempted of assignments actually submitted in each phase by special education diagnosis.


Student A - LD
Average Overall: 100% 36% 84% 93%
Average of Submitted: 100% 100% 99% 100%
Percentage of Homework Problems Attempted
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
Baseline 1
Treatment 1
Baseline 2
Treatment 2
Homework Assignment
Attempted
Not Submitted


Student B - LD
Average Overall: 77% 28% 73% 36%
Average of Submitted: 100% 100% 100% 81%
Percentage of Homework Problems Attempted
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
Baseline 1
Treatment 1
Baseline 2
Treatment 2
Homework Assignment
Attempted
Not Submitted


Student C - LD
Average Overall: 0% 10% 53% 30%
Average of Submitted: - - 100% 78% 100%
Percentage of Homework Problems Attempted
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
Baseline 1
Treatment 1
Baseline 2
Treatment 2
Homework Assignment
Attempted
Not Submitted


Student D - LD
Average Overall: 0% 13% 0% 5%
Average of Submitted: - - 100% - - 100%
Percentage of Homework Problems Attempted
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
Baseline 1
Treatment 1
Baseline 2
Treatment 2
Homework Assignment
Attempted
Not Submitted



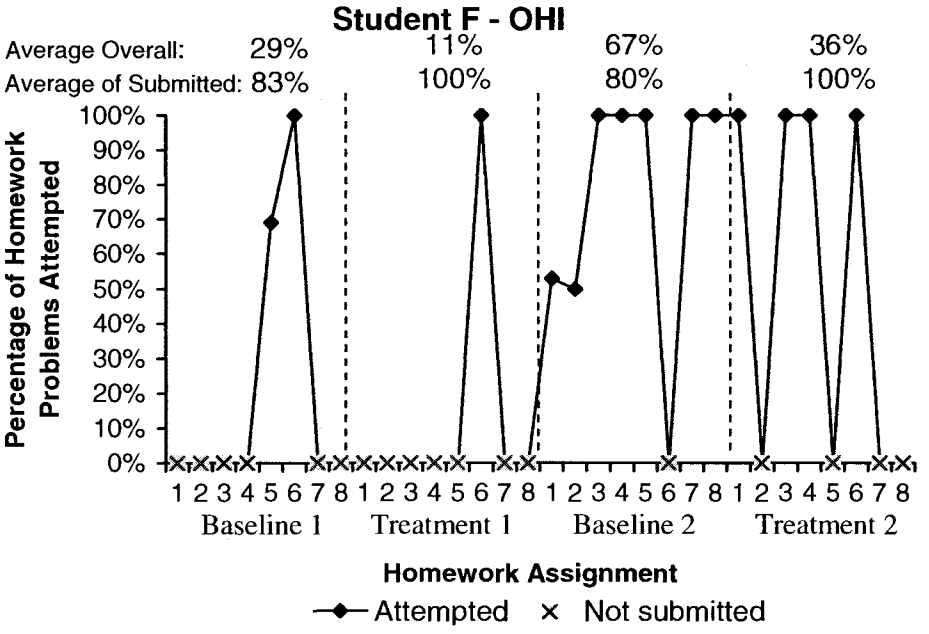


Figure 7. Percentage of homework problems attempted per assignment for all phases by student.

Statistical Analysis

A repeated measures ANOVA was to be conducted to examine the effects of pictorial reinforcement on homework completion rates. The inferential statistics could not be conducted due to the small sample size. Only assignments that were submitted by students were to be included in this analysis. Descriptive statistics are presented in Table 3.

Table 3

Descriptive Statistics for Homework Completion by Phase of Assignments Submitted

	M	*SD*	Range	*N*
Baseline 1	95%	8%	83% to 100%	5
Treatment 1	95%	10%	80% to 100%	6
Baseline 2	91%	8%	79% to 100%	5
Treatment 2	95%	9%	81% to 100%	6

Homework Accuracy

Visual Analysis

Visual analyses were conducted to determine if pictorial reinforcement based on a reinforcement survey increased homework accuracy rates of students. The average percentage of problems that students completed correctly, on all possible assignments, was calculated for each phase. To obtain these percentages, each student's percentage of daily problems correct was summed for the phase. Students who did not submit an

assignment received a score of zero for accuracy. All students' scores in the sample were then summed and divided by the total number of students. These were then multiplied by 100 to obtain percentages. In the first baseline phase, the average percentage of homework problems correct was 30%. The average then decreased to 16% in the first treatment phase. An increase was observed in the second baseline condition of 38% correct. The final treatment phase resulted in an average rate of 35% correct (see Figure 8).

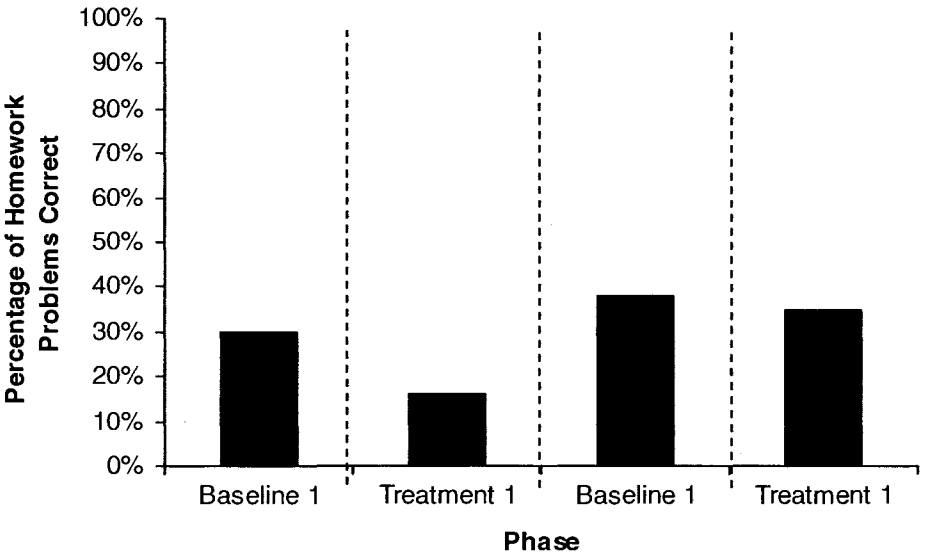


Figure 8. Average percentage of homework problems correct per phase for all students.

Additional calculations for accuracy were conducted utilizing only the assignments submitted by students to ensure results for homework accuracy were not misleading. Of the homework assignments submitted, the number of problems correct was summed and divided by the number of problems possible. This number was then multiplied by 100 to obtain a percentage. In the first baseline condition, of the submitted assignments, 67% of homework problems were correct. This number decreased to 62% in

the first treatment condition and then decreased again in the second baseline condition to 58%. In the final treatment condition the percentage of homework problems correct of the assignments submitted increased to 62% (see Figure 9).

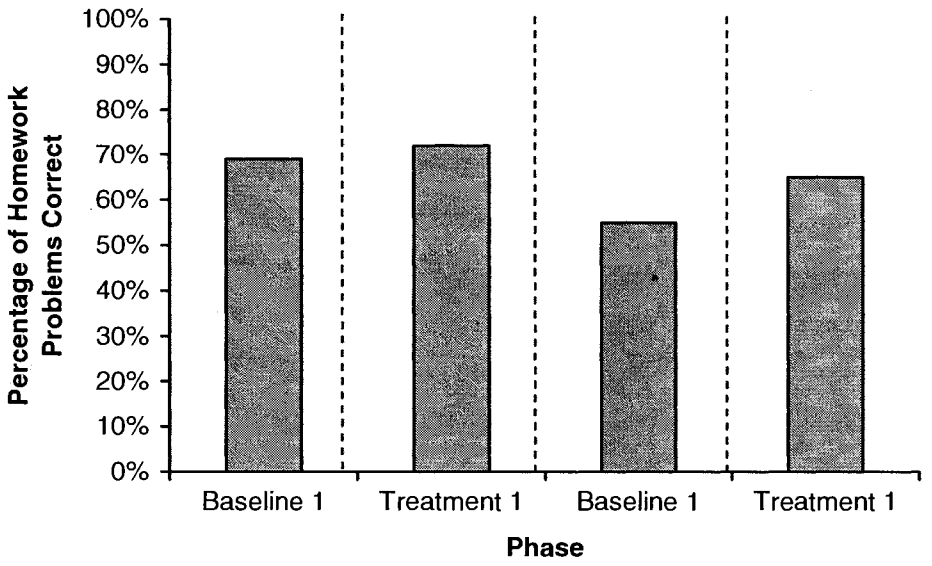


Figure 9. Average percentage of homework problems correct of assignments submitted per phase for all students.

Results were also graphed by special education disability for submitted homework assignments. Figure 10 indicates that consistently the student diagnosed with OHI (student F) had higher levels of accuracy as compared to the students diagnosed with LD and ED. Additionally, student F correctly answered more homework problems during the treatment conditions than the baseline conditions when only submitted assignments were reviewed (see Figure 11). Another pattern that emerged indicated that as a group, students with LD experienced higher rates of accuracy in the first two phases of the study as compared to the final two phases when examining the final two phases. One student with LD (student B) obtained more correct answers on submitted assignments during the

baseline conditions than the treatment conditions. Student D, who also had a diagnosis of LD, correctly answered more homework problems during the treatment conditions than the baseline conditions, although it should be noted that this student only submitted one assignment during each of the treatment conditions. The final two students with diagnoses of LD (students A and C) displayed inconsistent patterns of problems correct on submitted homework assignments between the four phases. The final pattern found involved the only student with a diagnosis of ED. This student (student F) displayed higher levels of accuracy both at the beginning and end of the study with a lack of accuracy in the middle two phases.

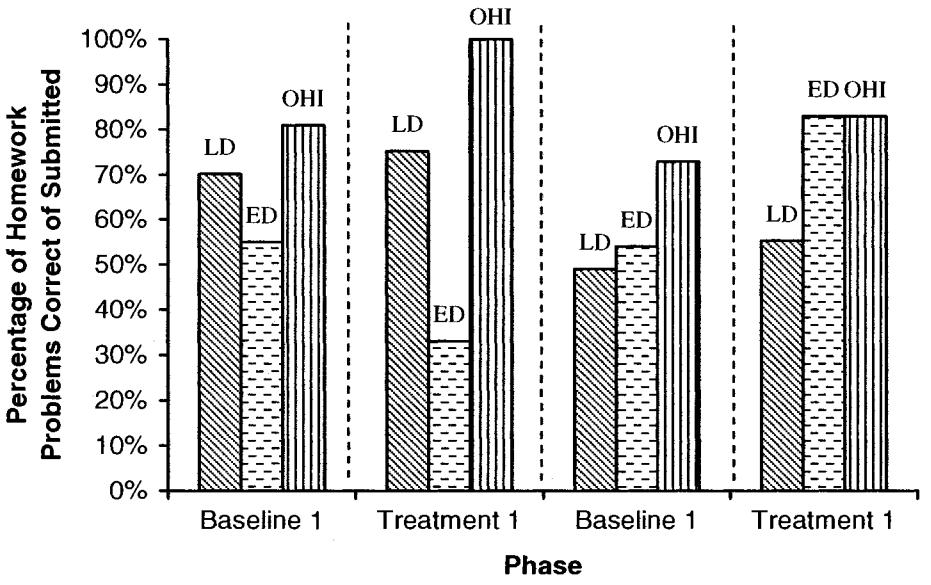
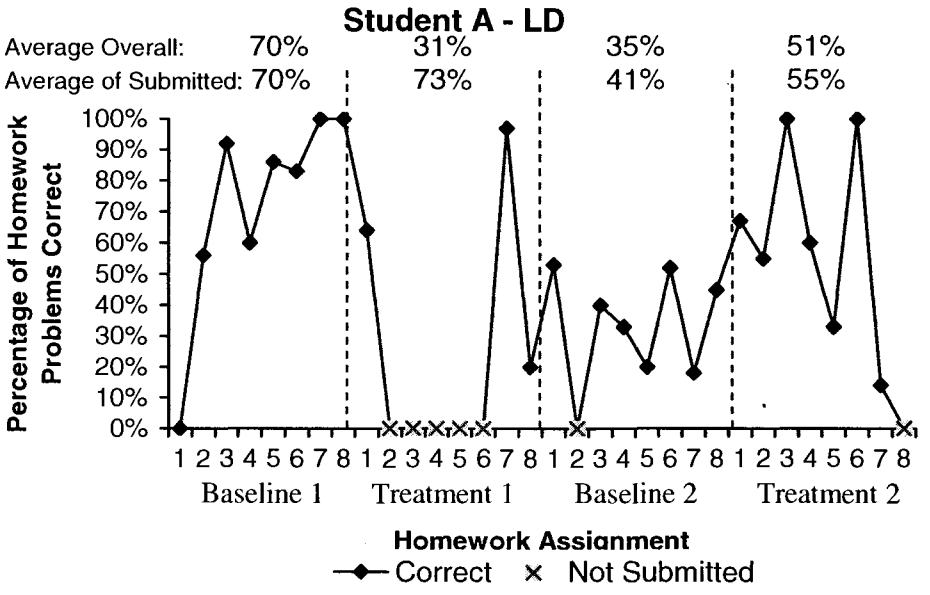
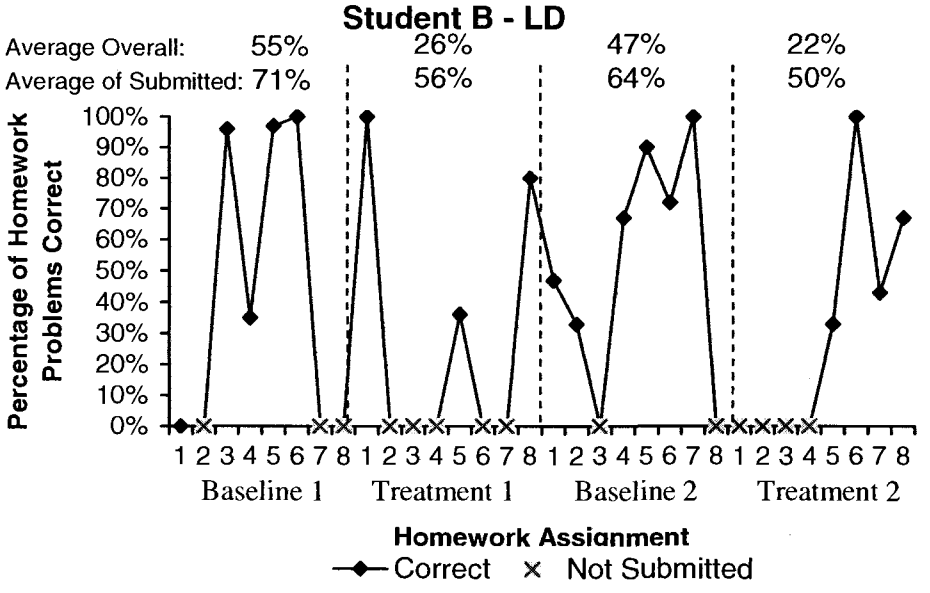
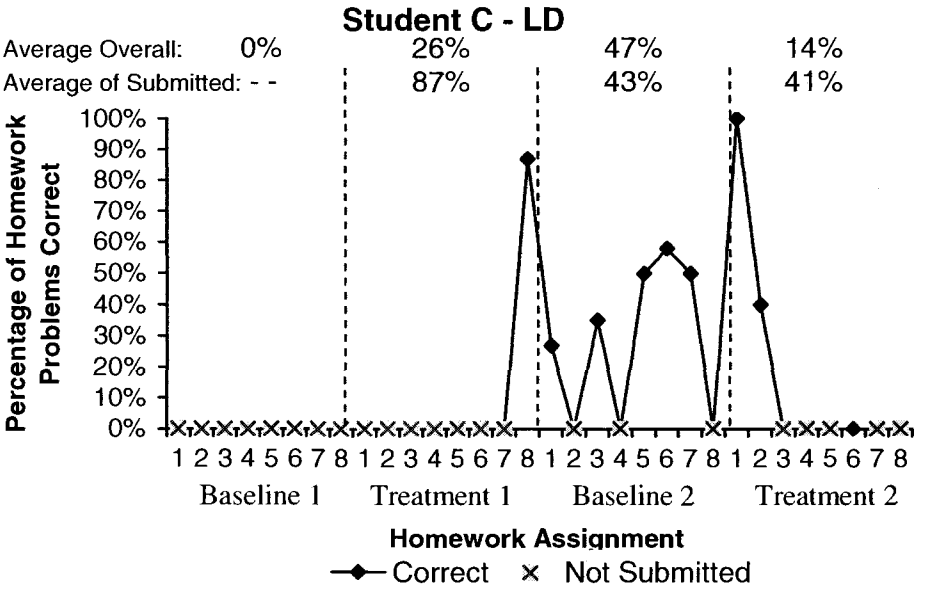
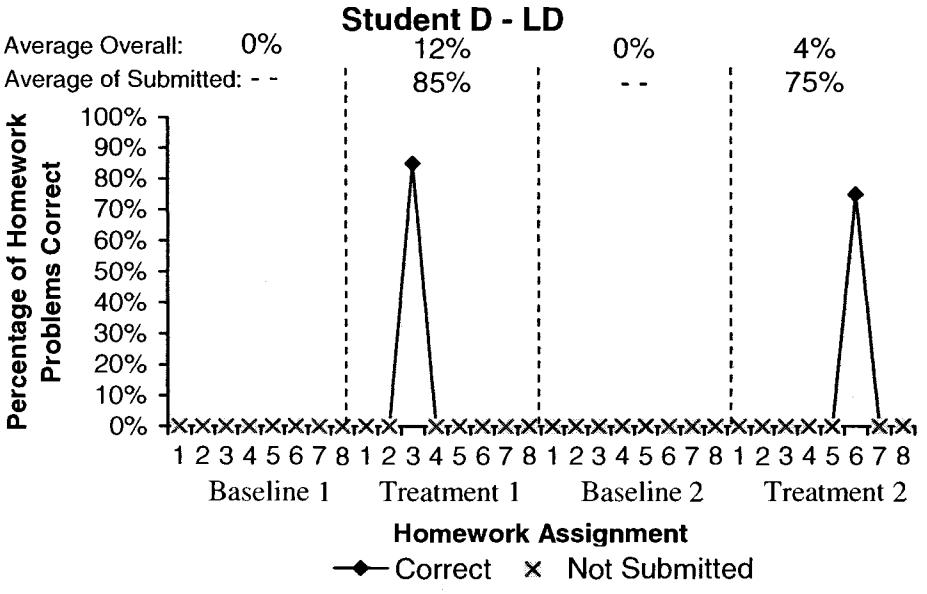


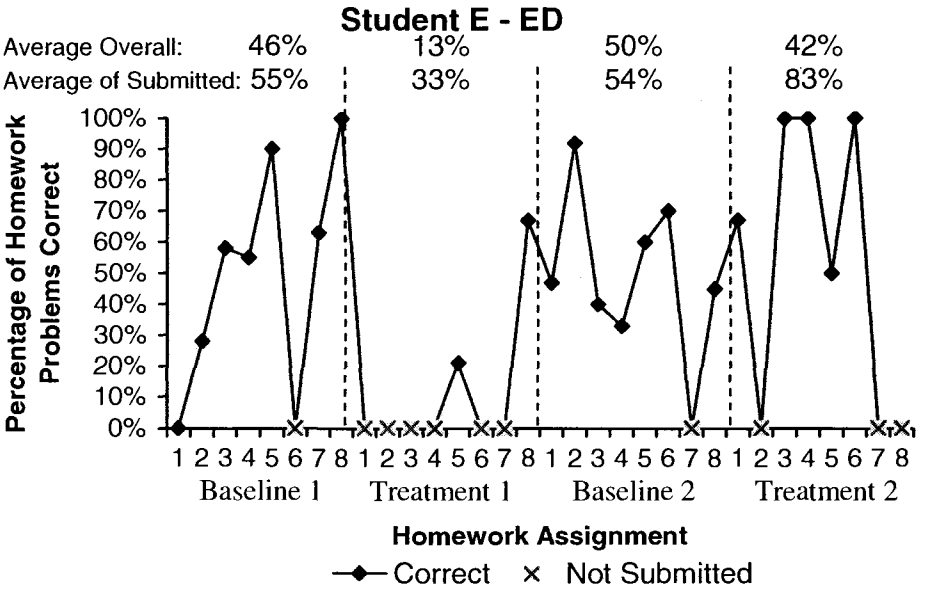
Figure 10. Average percentage of homework problems correct of assignments submitted per phase by special education disability.


Student A - LD
Average Overall: 70% 31% 35% 51%
Average of Submitted: 70% 73% 41% 55%
Percentage of Homework Problems Correct
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
Baseline 1
Treatment 1
Baseline 2
Treatment 2
Homework Assignment
Correct
Not Submitted


Student B - LD
Average Overall: 55% 26% 47% 22%
Average of Submitted: 71% 56% 64% 50%
Percentage of Homework Problems Correct
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
Baseline 1
Treatment 1
Baseline 2
Treatment 2
Homework Assignment
Correct
Not Submitted


Student C - LD
Average Overall: 0% 26% 47% 14%
Average of Submitted: - - 87% 43% 41%
Percentage of Homework Problems Correct
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
Baseline 1
Treatment 1
Baseline 2
Treatment 2
Homework Assignment
Correct
Not Submitted


Student D - LD
Average Overall: 0% 12% 0% 4%
Average of Submitted: - - 85% - - 75%
Percentage of Homework Problems Correct
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8
Baseline 1
Treatment 1
Baseline 2
Treatment 2
Homework Assignment
Correct
Not Submitted



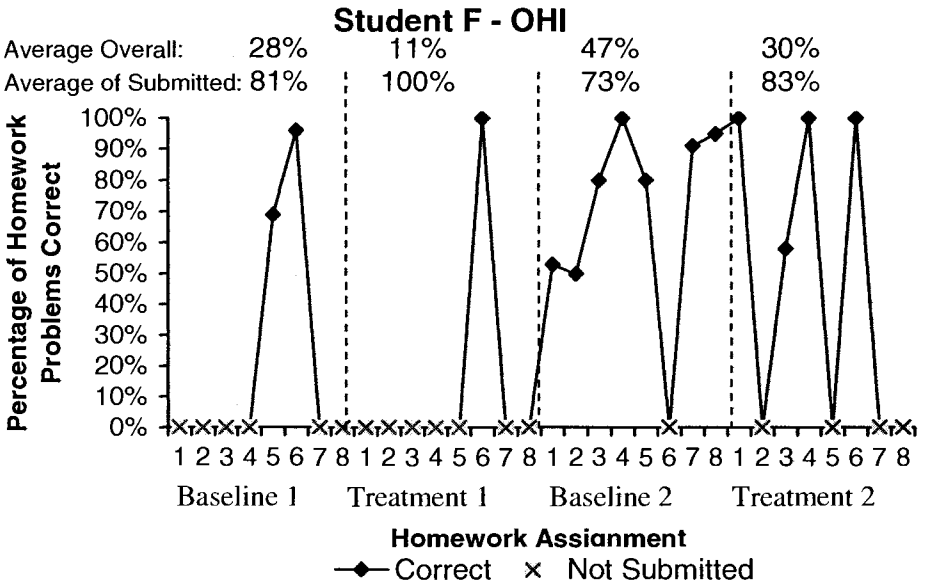


Figure 11. Percentage of homework problems correct per assignment for all phases by student.

Statistical Analysis

A repeated measures ANOVA was to be conducted to examine the effects of pictorial reinforcement on homework accuracy. Inferential statistics could not be conducted due to this study's small sample size. Only assignments that were submitted by students were to be included in this analysis. Descriptive statistics are presented in Table 4.

Table 4

Descriptive Statistics for Homework Accuracy by Phase of Assignments Submitted

	M	SD	Range	N
Baseline 1	69%	11%	55% to 81%	4
Treatment 1	66%	28%	56% to 100%	6
Baseline 2	59%	13%	41% to 73%	5
Treatment 2	68%	18%	41% to 83%	6

Reinforcement Survey

Analysis of the reinforcement survey was conducted to determine the categories of reinforcers the middle school students in a restrictive classroom placement preferred. This was completed using cluster coding (Miles & Huberman, 1994) of students' answers to question 19 and 20 on the reinforcement survey. Question 19 stated, "From all of your answers, what are your three favorite?" Question 20 read, "Are there other things/activities that are your favorite that we didn't talk about?" Cluster coding involved

reviewing all responses and grouping those similar in theme. Eight overarching themes were developed to categorize the students' answers to questions 19 and 20. To ensure reliability of the coding, two independent graduate student researchers were asked to code the data utilizing the created themes. Independent coding resulted in 100% agreement.

Results of the cluster coding indicated that six students chose playing sports or watching sports as their favorite thing from the questionnaire. Example responses included, "playing kickball," "playing football," and "watching the Colts." These responses were combined to create the category "Sports." The second most popular category, with five students stating this was one of their favorite things, was "Visual Media." The category included movies, television shows, and favorite actors and actresses. Example responses from this area included "Old Yeller," "CSI-Miami," "Jessica Simpson," and "John Wayne." The remaining four categories had two students suggesting preference in each area. The categories were "Video Games and Game Consoles," "Animals," "Reading Materials," and "Audio Media." Example of video games included "Happy Feet" and "ATV Off Road," while examples of animals included "dogs," "cats," and "cheetahs." Example reading materials mentioned included teen magazines and books, while example audio media included "Irish music," "Creed," and the "Black Eyed Peas." The final two categories had only one student indicating preference in these areas. The first category was "Food" and the second was "Other," which included the student's friends.

Chapter 4

DISCUSSION

Homework Submission

Homework submission for middle school students in a restrictive classroom environment was analyzed by examining the number of assignments submitted by the sample, as well as individually. Results suggested that homework was submitted most often during the baseline two condition, when no reinforcement was offered. The next phase in which homework was submitted most often was the treatment two condition. Although this condition did not have the most homework submitted, every student submitted at least one homework assignment. The condition that resulted in homework submission rates that ranked third overall, was baseline one condition. Finally, the phase with the least submitted homework was treatment one condition. Therefore, the current intervention does not appear to have impacted homework submission rates significantly.

Homework submission was also visual analyzed by special education disability. Although only one student was diagnosed ED, that student submitted more homework on average than students in any other disability category. Both students in the LD group and the student diagnosed OHI appeared to have submitted more homework in the latter two phases of the study. Finally, all students, regardless of disability category displayed low

submission rates during the first treatment condition. Overall, the pictorial reinforcement intervention did not show significant effects regardless of disability category.

Statistical analyses for homework submission rates of all students suggest that a statistically significant difference existed among phases. Students submitted more homework assignments during the baseline two condition, when no reinforcement was offered, as compared to the treatment one condition. These data should be interpreted cautiously due to the small sample size and low power for this analysis. These data do not support the hypothesis that students would submit more homework assignments when reinforcement was offered. Research with operant conditioning principles suggest that if reinforcement pictures were truly reinforcing to the students, then homework submission rates would have increased during treatment conditions (Pierce & Cheney, 2004).

The results of the present study are contradictory to other similar studies that utilized reinforcement to increase homework submission. For example, fifth grade general education students in Hinton and Kern's 1999 study submitted more homework assignments during intervention phases when they were told their name would appear on the next homework assignment as a reward. Additionally, a study that utilized students' interests in homework assignments and offered reinforcement for homework submission found that kindergarten through sixth grade students with homework submission problems turned in more assignments when both their interests and reinforcement were included in the assignment (Bryan & Sullivan-Burstein, 1998). Findings of the present study suggest that pictures were not a powerful enough reinforcer for the participants, despite using pictures of favorite items and people as indicated on a reinforcement survey.

Also the results of the current study are contradictory to the findings of Olympia et al. (1994). Olympia et al. required middle school students from general education classrooms to meet a set homework completion goal in order to receive reinforcement. Results indicate that submission rates increased overall. Students who set their own goals increased their submission rates from approximately 40% to 74%, as compared to those who worked toward a teacher selected goal (35% to 61%). Callahan et al. (1998) also found increased homework submission rates for "at risk" middle school students during their parent and student self-monitoring intervention. Results indicated baseline submission rates at approximately 33% and an increase of homework submission to 69% during treatment. An extension of this study was conducted with students diagnosed with EBD, which resulted in an increase in homework submission from 2% to 92% (Cancio et al., 2004).

An intervention that presented mixed results for homework submission was conducted by Bryan and Sullivan-Burstein (1998). Students were required to use an assignment notebook to record all assignments, while parents were requested to check the notebook and review assignments. Results indicated that students with LD who had no homework problems showed the most increase in submission followed by students diagnosed with LD who had homework problems. The students in both the "average achieving" no homework problems group and "average achieving" homework problems group showed relatively no improvement.

Several key factors may have impacted the results of the current study. Prior to the start of this homework intervention, the classroom teacher did not assign daily homework. The lack of homework submission observed during the first baseline

condition, as well as the first treatment condition, may be directly related to resistance to complete daily homework on the part of students. As the routine of daily homework continued, students may have become less resistant resulting in higher homework submission rates in the last two conditions. Although homework submission rates during the treatment conditions did not surpass all baseline condition rates, one student did complete an assignment in each of the two treatment conditions, as compared to zero assignments in the baseline conditions. This may indicate that this particular student was curious about what reward he would receive for completing the assignment. Due to the fact that the student completed only one assignment within each treatment phase, a hypothesis could be made to suggest that not completing the assignment was more reinforcing than the reinforcement picture (Pierce & Cheney, 2004). The reinforcement value of the pictures appears to be weaker than other activities the student would be able to do if he or she did not complete the assignment.

Previous research on reinforcement has utilized items such as stickers or other tangible items that students have been able to hold and manipulate. The present study did not utilize a three dimensional object, so students were not able to manipulate the reinforcer in the same manner. This difference may have affected the reinforcement value of the pictures for some students. Additionally, many of the studies which utilize stickers in the literature focus on the age group of 2 to 6 year olds. For example, Allen and Stokes (1987) found that 3 to 6 year olds who were afraid of the dentist showed decreased levels of anxiety (90% to 15%) following being reinforced with stickers for seeing and hearing dental tools. Roberts and Broadbent (1989) found that when stickers were presented to children in daycare for wearing their seatbelts, seatbelt usage increased from

approximately 38% to 86%. A study that utilized elementary school students, but used pictures instead of stickers, was conducted by Gross and Shapiro (1981). This study found that when students with LD were reinforced by having pictures of themselves posted in the classroom, spelling test performance increased from 45% to 75%. Although there is limited support for sticker reinforcement with older children, one study that utilized stickers with sixth grade students was the 1994 study by Hyland and Keaton. Students were asked to self-monitor off-task behavior. If teacher's and student's graphs were similar the student received a sticker. Off-task behavior during the baseline condition was 18% compared to only 3% in the treatment condition. Overall, off-task behavior decreased when self-monitoring was combined with sticker reinforcement.

Previous research has indicated that some students with LD do not complete homework due to being unable to complete the work on their own at home. Moreover, studies have noted that approximately 25% of students with ED also have a comorbid diagnosis of a LD which could contribute to their not submitting assignments (Wagner et al., 2005). Researchers have indicated that students with ED and LD diagnoses have similar homework completion problems due to two primary causes, one of which is poor construction of assignments by teachers (Epstein et al., 1993). The present homework intervention did not change the layout or content of the teacher's pre-made homework assignments. Therefore, students may have found the assignment problematic, thus decreasing their homework submission.

Homework Completion

Visual analyses were also conducted to determine the pattern of homework completion for the middle school students in a restrictive classroom environment. When

completion rates were calculated for all assignments, utilizing a zero for completion of non-submitted assignments, results suggest that similar to the homework submission rates, the most homework problems were completed during the second baseline condition. This was followed by treatment condition two, baseline condition one, and finally treatment condition one.

More importantly, when homework completion rates were calculated using only the homework assignments submitted during each phase, results indicated that all phases on average resulted in at least 90% homework completion. When a zero was given as a homework completion score for non-submitted assignments, it was found that there was much variability between phases for completion as compared to when non-submitted assignments were not factored in. When considering only submitted assignments, the phase with the highest rate of completion was baseline one condition. The phase with the second most problems completed was treatment condition two, followed by treatment condition one, and finally baseline condition two. These results indicate that when a student turns in an assignment he or she completes almost all of the problems presented.

Graphical representations of homework completion by students in each special education disability group found only limited visual patterns. Overall, all students, regardless of disability, had high levels of completion when homework was submitted. The student with the OHI diagnosis displayed the highest levels of completion during the two treatment conditions. The students diagnosed LD showed slightly more homework completion when homework was submitted during the first and second phases as compared to the latter phases. No other visual patterns were found among groups.

Although patterns were found for students within disability groups, no two students' data were identical. As discussed previously, students in restrictive classroom environments have many different needs and difficulties that place them in a more restrictive learning environment (Duncan & Brooks-Gunn, 1997; Trout et al., 2003). Therefore, homework completion rates often vary among students even with the same diagnoses. For example, of the four students in this study with an LD diagnosis, two students attempted more homework problems during the two treatment conditions than during the baseline conditions. One student completed more homework problems during the two baseline conditions than the treatment conditions and one student attempted almost all homework problems on submitted assignments throughout the four phases.

These inconsistent results between students with the same disability diagnosis appear to be similar to another study that utilized self-report reinforcement surveys. In the 1994 study by Moore et al., students were required to complete 100% of their homework for the week to receive reinforcement. In one of the classrooms sampled, 75% of the students responded positively to the intervention, completing more homework during the intervention phases than the baseline phases. These results support the idea that reinforcement values are different for all students due to 25% of the sample not completing more homework during the treatment conditions. Another study which was formatted similarly to the current study was the 1999 study by Hinton and Kern. Fifth grade general education students were told that if they submitted their homework the next school day with the problems completed, their name would appear in a problem on the next homework assignment. The use of the student's name as reinforcement appeared to increase the students' submission and completion rates during the treatment conditions. It

is not clear if including the students' name alone was reinforcing or if students enjoyed their classmates knowing they submitted their assignment.

In the current study homework submission and completion were separated. This was important due to so many assignments not being submitted. When homework completion was analyzed utilizing a zero for non-submitted assignments, a misleading low completion rate was found. If this number were to be reported alone, it would indicate that when students complete their assignments they only did approximately half of each assignment. In comparison, when only submitted assignments were analyzed for completion, results indicate that over 90% of the assignment was completed. Other studies that focused on homework completion did not appear to have homework submission difficulties and therefore did not separate the two variables (e.g., Hinton & Kern, 1999; Moore et al., 1994). When comparing the current study to those found in the literature, the current study reports extremely high completion rates during the baseline conditions when only submitted assignments were reviewed compared to studies such as Hinton and Kern's. When homework completion was calculated with students who did not submit assignments receiving a zero, rates were more closely related to other studies in the literature. For example, Hinton and Kern found that 59% of students did not complete assignments in the baseline conditions, as compared to the current study's overall baseline average of 53%.

An analysis of variance was originally planned to examine if there was a significant difference between phases for homework completion. Due to the study's small sample size, as well as limited submission of homework by students in all phases, this analysis could not be conducted.

Homework Accuracy

Both group and individual rates were reviewed to analyze the pattern of homework accuracy for middle school students in a restrictive classroom environment. When reviewing all of the data utilizing a zero for the accuracy scores of students who did not submit assignments, the phase with the highest accuracy rate was baseline condition two. The phase with the second highest level of accuracy was treatment condition two followed by baseline condition one, and treatment condition one.

More importantly, homework accuracy rates were calculated using only the homework assignments submitted during each phase. When using a zero for non-submitted assignments, the phases with higher levels of homework accuracy were different than when analyzing the data with only submitted assignments included. When looking at the data overall for only submitted assignments, the range of homework accuracy was limited between phases (55%-72%). This indicates that the students accurately completed a similar percentage of problems during both treatment and baseline conditions. It was determined that accuracy rates were highest during baseline condition one, followed by baseline condition two. The phase with the next highest level of accuracy was treatment condition one and finally treatment condition two.

Ideally, a homework intervention would increase accuracy as well as completion and submission rates. Although the accuracy rates did not increase significantly during the treatment conditions, they also did not decrease, suggesting that the reinforcement pictures were not distracting to the students' performance.

Graphical representations of homework accuracy by students in each special education disability group found only limited visual patterns. Although only one student

was diagnosed OHI, the homework accuracy rates for that student were consistent throughout all phases when reviewing only submitted assignments. In contrast, the students in the LD group showed a pattern of increased homework accuracy when assignments were submitted during the first two phases of the study, while exhibiting decreased levels of accuracy during the latter two phases. Also in contrast was the pattern of homework accuracy by the student diagnosed with ED. This student displayed higher levels of accuracy during the first and last phases, while exhibiting lower levels of accuracy on assignments submitted during the two middle phases. These findings do not support the hypothesis that students would accurately complete more assignments during the treatment conditions as compared to the baseline conditions.

Many of the research studies that discuss homework accuracy involve interventions that require parent participation to help students learn classroom material. One study that did not involve parents, but utilized the "mystery motivator" classroom intervention to increase homework accuracy rates found that all students increased either their homework accuracy or completion rates or both during the study (Madaus, Kehle, Madaus, & Bray, 2003). Additionally, many studies have shown that academic achievement is highly correlated with homework completion rates (Trautwein et al., 2001). This may be due to the student receiving additional practice of classroom taught principles on homework assignments. Therefore, in order for an intervention to increase practice, accuracy of homework problems, and academic achievement, students must complete their assignments. One hypothesis may be that the current study did not increase homework submission rates enough to improve practice; therefore, accuracy did not increase.

Contrary to the present study, Callahan et al. (1998) conducted a study in which accuracy rates were found to increase. The results indicated that as parent participation increased to support the student in accurate self-monitoring, homework accuracy rates also increased from 26% during the baseline conditions to approximately 62% during treatment. Another study that reviewed accuracy rates in their homework completion intervention was the "Mystery Motivator" study conducted by Moore et al. (1994). Results indicated that in classroom one, accuracy rates increased from approximately 57% to 81%. In classroom two, less improvement was shown with students having an average baseline of 52% and a 65% accuracy rate during treatment. Overall, the current study resulted in moderate but consistent accuracy rates.

Reinforcement Survey

A reinforcement survey was constructed to determine potential reinforcers for middle school students in a restrictive classroom environment. From student responses to questions 19 (From all of your answers, what are your three favorite?) and 20 (Are there other things/activities that are your favorite that we didn't talk about?) eight themes were uncovered. The themes that emerged from question 19 were, "Sports," Visual Media," "Video Games and Game Consoles," "Animals," "Audio Media," and "Food." Two areas were also created due to students' responses to question 20 which involved other areas of interest that were not discussed on the questionnaire. These included "reading materials" which was cited by two students who indicated that they preferred books and magazines, and "other," which included the student's friends.

A few highly preferred categories from the reinforcement questionnaire were expected by the researcher. Many students indicated that "watching the Colts" was one of

their favorite activities. This was not surprising given that this pro football team won the Super Bowl a few months prior to the start of this study. In addition to sports being a favorite, the area of visual media was also expected to be rated by most students because of the popular culture categories it included, such as television shows, movies, actors, and actresses. Although the researcher thought this category would be highly rated due to students stating newly released movies and top-rated television shows were their favorites, students generally stated that older movies and less popular television shows were their favorites. For example, one student indicated that "Walker Texas Ranger" was his favorite television show, even though it was canceled in 2001; while another student indicated that the 1957 movie "Old Yeller" was her favorite movie. The other area expected to be rated highly by students was "video games and game consoles." Only one-third of the participants indicated this area as a favorite which was less than expected. Example game and game consoles mentioned included Happy Feet, ATV Off Road, Play Station 2, and X-Box. All students were able to quickly provide the researcher with the name of their favorite game; however, many did not indicate this as a favorite area.

Limitations

As with all studies, there are limitations of this investigation. One limitation of this study was the small number of students available to participate. The main reason for this was that only a small number of students qualify for restrictive classroom environment placements. Additionally, only 58% of the parent consent forms were returned, even though three different methods were used to obtain consent. With a small sample size, statistical analyses such as ANOVA have less power to find significant

differences among phases. Also, to increase internal validity the researcher chose to select students from one class in order to keep the teacher constant, as well as the course and homework content. A small sample size may also affect the generalizability of the results of the reinforcement survey. In addition to the small sample size, the range of special education disabilities represented in the classroom was limited to Learning Disability, Emotional Disability, and Other Health Impairment with only one student in the latter categories.

Third, when analyzing homework completion and accuracy data, it is clear that many assignments were not submitted by students throughout the study. This, along with a small sample size, limited the number of assignments available for analysis throughout the study. Due to these two limitations, statistical analyses could not be conducted on completion and accuracy data. The fourth limitation was that the classroom teacher did not supply homework to her students on a consistent basis prior to this study. This created some resistance by students when assignments became a daily requirement. Additionally, students were required to take home parent permission forms twice due to low return rates. By having student transport these forms, as well as having parents complete consent forms, students may have become aware that they were participating in a study and may have tried to alter its results. This may account for decreased homework submission during the first two phases of the study. Another limitation of this study was the variability in the number of homework problems during the four phases. Although the first three phases had a similar number of problems, phase four had significantly fewer problems. Finally, due to the timing of the study, a few variables may have contributed to the lack of homework being submitted or completed. The study ended a week prior to the

last day of school. Also, the first few days of warm weather occurred during this study, potentially decreasing the value of the pictorial reinforcement and increasing the reinforcement value of spending time outside.

Implications for Research

Due to findings that suggest reinforcement pictures may not hold enough reinforcement value for students in sixth through eighth grade, research should be conducted with younger populations to determine if reinforcement pictures based on a reinforcement survey have any reinforcement value. Previous research has indicated that students in the second grade have responded positively to pictures of themselves as reinforcement (Gross & Shapiro, 1981). Therefore, it is suggested that research begin with students around second or third grade.

Due to the sample size limitations in the current study, a larger sample size that includes multiple individuals from each disability category, as well as from multiple schools, should be utilized to increase statistical power, as well as generalizability of results. Due to the inability to hold the teacher variable constant, increased monitoring of inter-observer agreement and treatment integrity should be considered. To rule out negative results due to the student's special education disability, future researchers may consider using a control group of same-aged peers from the general education population. This would help to determine if students were not submitting and completing assignments due to a lack of academic achievement.

Another possible area to explore would include using the same intervention techniques while reviewing homework submission, completion, and accuracy at the beginning of the school year. By implementing the intervention at the beginning of the

school year, students would become accustomed to daily homework prior to developing expectations and patterns of behavior that may affect the results. It should be noted that the current intervention was not found to be effective with middle school students; therefore, any future research using the same methodology should be done with a younger age group. Moreover, if one is to study homework submission, completion, and accuracy, it would be important to conduct analyses on completion and accuracy data for only the assignments submitted. When students are given a score of zero for assignments not submitted, results may become obscure and misleading.

Future researchers may also want to speak with their participants following the study to obtain true feelings and opinions about the intervention. Questions should also be asked regarding the make-up and difficulty level of daily assignments. Moreover, research should be conducted to determine what students feel would motivate them to complete their homework assignments on a consistent basis.

Implications for Practice

The current intervention should not be utilized with students from the sixth to eight grade due to the lack of power this type of reinforcer may have with this population. With new federal laws suggesting Response to Intervention (RTI) techniques be used for students who are having academic complications, more research should be conducted regarding homework submission, completion, and accuracy interventions.

The current study found changing students' behavior regarding daily homework to be difficult, therefore, teachers should begin assigning consistent daily homework at the start of the school year. The current study also found that when students submitted their assignments, they completed the majority of the presented problems and had

moderate levels of accuracy. Therefore, school psychologists should focus intervention for students with homework difficulties on increasing submission rates with the hope that completion and accuracy will continue to be high.

School psychologists should continue to examine the effects of using reinforcement surveys with special education populations. Moreover, inexpensive and easy reinforcement techniques should be tried within a classroom setting to promote student success.

The current study, with its limited sample size, found that the majority of students preferred the areas of "Sports" and "Visual Media." These categories were highly rated by students, although the reinforcement value of these pictures did not appear to be significant. However, because students rated these areas highly, it may be useful to incorporate these categories within assignments and into future reinforcement surveys.

Conclusion

This study's results did not provide support of this homework submission, completion, and accuracy intervention for middle school students in a restrictive classroom environment. Visual analyses suggest that on rare occasions students submitted or completed more homework problems during a treatment condition than a baseline condition, but results were not consistent among the phases, on a class-wide level, or when reviewed by disability. The same problem was found when reviewing accuracy rates. Overall, when students did submit assignments, the majority of the assignment was completed and about two-thirds of the answers were accurate. As past research has indicated, students with special needs often require individualized

interventions that provide rewards with high reinforcement value. However, this intervention does not appear to be powerful enough for this specific population.

Due to the lack of reinforcement research in the literature focusing on restrictive classroom populations and homework, as well as the need for diverse interventions for students with different needs, additional interventions for students in this population should be developed and analyzed to determine effectiveness (Moore et al., 1994; Olympia et al., 1994).

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APPENDIXES

APPENDIX A

Parental Permission Form

February 1, 2006

Dear Parents or Guardian:

I am Lisa Diedrick, a doctoral student in the school psychology program at Indiana State University. With permission from Mrs. Waite, your child's teacher, and Honey Creek Middle School, I am asking permission for your child to be part of a research study. The study will be used for my doctoral dissertation under the direct supervision of Dr. Coleman, an Indiana State University faculty member. The purpose of this research study is to motivate students to turn in their homework assignments the day they are due. To complete this, I am asking for your permission for your child to do the following:

1. Answer 20 short interview questions regarding some of their favorite activities, foods, sports, animals, television shows, and movies.

2. Complete homework assignments as usual. These assignments will contain the same problems as usual but will contain a cover sheet with a picture of an item your child indicated in the above mentioned interview. Once your student turns in his or her assignment, he or she will receive credit for the assignment as usual from the classroom teacher. I will then review the assignments for research purposes. I will be looking at if your child turned in the assignment when it was due, how many problems he/she attempted, and the accuracy of his/her answers.

For confidentiality purposes, only Dr. Coleman and I will have access to your child's information. All information regarding your child, including parent permission forms, will be stored in a lockbox and kept with the researcher. Your child's homework will never leave their classroom. At the conclusion of the study, homework submission, completion, and accuracy rates will be reported in this study. There will be no identifying information (e.g., students' names) included about your child.

Your child's participation in this study is voluntary. Refusal to participate now or at any time during the study will not result in penalty or loss of any benefits your child is otherwise entitled. After your permission is obtained, your child will also be asked if he or she is willing to participate in this study. The researcher may choose to terminate your child's participation in this study if prolonged absences of the student occur. Termination of your child's participation in the study by me will not result in penalty or loss of benefits to which your child is otherwise entitled. You and your child are not waiving any legal claims, rights, or remedies because of your child's participation in this research study.

There are no foreseeable risks to your child for participating in this study. All class material on homework assignments will remain the same independent of participation.

Should you have any questions or desire further information, please feel free to contact:

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Please keep this letter after completing and returning the signature page to me.

If you have any question about your rights as a research participant, you may contact the Indiana State University Institutional Review Board (IRB) by mail at 114 Erickson Hall, Terre Haute, IN. 47809, or by phone at (812) 237-8217, or e-mail the IRB at irb@indstate.edu. You will be given the opportunity to discuss any questions about your rights as a research participant with a member of the IRB. The IRB is an independent committee composed of members of the University community, as well as lay members of the community not connected with ISU. The IRB has reviewed and approved this study.

Sincerely,

Lisa A. Diedrick, M.Ed.
Doctoral Candidate
Principal Investigator

Please indicate whether or not you wish to allow your child to participate in this study. Place a check mark next to one of the statements below. Then please sign and print your name on the lines below. Please sign both copies and keep one for your own records.

_____ I **do** grant permission for my child to participate in Ms. Diedrick's study of homework submission, completion, and accuracy rates in children in restrictive classroom environments.

_____ I **do not** grant permission for my child to participate in Ms. Lisa Diedrick's study of homework submission, completion, and accuracy rates in children diagnosed in restrictive classroom environments.

_____ _____

Signature of Parent/Guardian Printed Parent/Guardian Name

_____ _____

Printed Name of Child Date

APPENDIX B

Assent To Participate In Research

Intervention Targeting Homework Completion Rates and Accuracy of Students in a Restrictive Classroom Environment.

1. My name is Lisa Diedrick. I am from Indiana State University.

2. I am asking you to take part in a research study because I am trying to learn more about what items students your age find rewarding and are willing to work towards.

3. If you agree to be in this study I will ask you 20 questions about some of your favorite items and I will write down your answers to the questions.

4. If you chose to participate in this study there are no known risks.

5. The benefit of this study is that teachers will be able to provide students your age with rewards that they like instead of just trying to guess what you would like for a reward.

6. Your parents have given their permission for you to take part in this study. Even though your parents said "yes," you can still decide not to do this and that will be ok.

7. If you don't want to be in this study, you don't have to participate. Remember, being in this study is up to you and no one will be upset if you don't want to participate or even if you change your mind later and want to stop.

8. You can ask any questions that you have about the study. If you have a question later that you didn't think of now, you can ask me next time you see me or ask Mrs. Waite to contact me.

9. Do you agree to participate in the reinforcement survey?

APPENDIX C

Reinforcement Survey

Name:_____

1. How old are you?
2. What grade are you in?
3. Whom do you live with?
4. What is the highest level of education that your parents/or guardian has?
5. Does your parents/guardian work full time?
6. What is your favorite sports team?
7. What is your favorite color?
8. If you could choose any sport to play what would it be?
9. When you get older, what job would you like to have?
10. What is your favorite animal?
11. What is your favorite food?
12. What is your favorite type of pop/soda?
13. What is your favorite band or musician?

14. What is your favorite movie?

15. What is your favorite video game?

16. What is your favorite game console (e.g.: Xbox, game cube, play station)?

17. What is your favorite TV show?

18. Who is your favorite actor or actress?

19. From all of your answers, what are your three favorite?

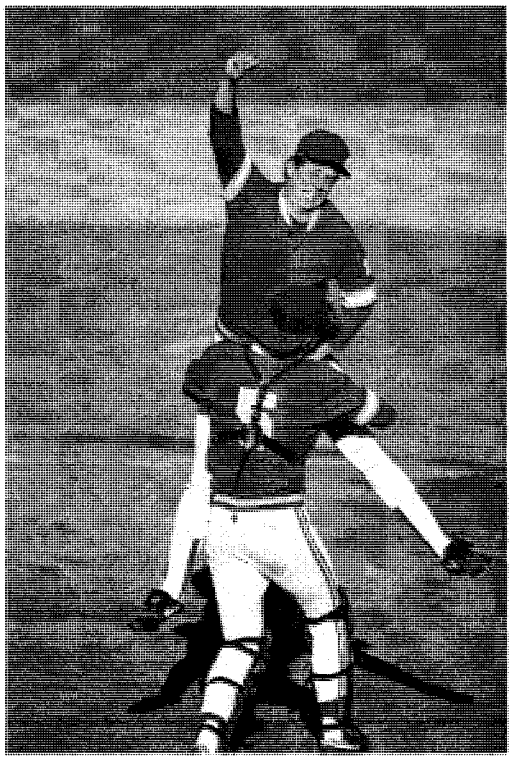
20. Are there other things/activities that are your favorite that we didn't talk about?

APPENDIX D

Example Cover Sheet With Reinforcement

Name: Bob Smith

Date: November 15, 2006



APPENDIX E

Example Cover Sheet With No Reinforcement

Name: Bob Smith

Date: November 15, 2006

APPENDIX F

Teacher Directions for Assignments

Baseline Phases

Please hand out each student's homework assignment based on the name printed at the top of the page. While handing out the assignment please read the following directions during the baseline phases:

"You are to complete this homework assignment tonight at home and bring it back to class tomorrow. The assignment will be collected tomorrow and graded. Does anyone have any questions?"

Treatment Phases

Please hand out each student's homework assignment based on the name printed at the top of the page. While handing out the assignment please read the following directions during the treatment phases:

"You are to complete this homework assignment tonight at home and bring it back to class tomorrow. If you bring the assignment back tomorrow you will get a reward on tomorrow's assignment. The assignment will be collected and graded. Does anyone have any questions?"