Student Attitudes in Inclusive Settings: Public Middle Schools[1]

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Abstract

The purpose of this study was to examine the effects of inclusive education on the general education population of middle school students' attitudes. Therefore, a quantitative study was designed as a quasi-experimental study to measure such attitudes. The study included non-random samples of one control group (non-inclusive) and one experimental group (inclusive). This study took place in a middle school in a large urban school district in the US. The participants of this study included 20 students without disabilities in each classroom with a total number of 120 students from a total of six different middle school classrooms. The study included two classrooms (one inclusive and one non-inclusive) for each grade level (6, 7, and 8). About 60% of these students were Hispanic, 50% were male, and 80% received free or reduced lunch. In addition, ages ranged from 11 to 15 years. Inclusion Survey for Middle School Students (ISMSS), which included 30 questions was used to measure the attitudes of students without disabilities towards students with learning disabilities. SPSS was used for descriptive and inferential statistical analysis. The findings of this study indicated that inclusive education had a negative effect on the attitudes of students without disabilities towards their peers with disabilities in public middle school classrooms.

Keywords :Student attitudes, students in general education, students with learning disabilities.

Introduction

Inclusive education is the practice of educating all or most children in the same classroom, including children with physical, mental, and developmental disabilities (McBrien & Brandt, 1997). Current reports show that students with disabilities in the U.S. are included more in mainstream classrooms and have more exposure to the general education curriculum than ever before (U.S. Department of Education, 2006). In traditional public schools, students with disabilities and their non-disabled peers develop conceptual understanding and positive attitudes in inclusive classrooms (Baker, Wang, & Walberg, 1994). Furthermore, students with disabilities who have access to general education classrooms make more academic progress than those students in special education settings (Peetsma, Roeleveld, & Karsten, 2001).

Failing to incorporate students with learning disabilities into inclusive classrooms may result in school dropouts and increased unemployment rates due to lack of conceptual understanding in core subjects. According to the Twenty Fourth Annual Report to Congress on the Implementation of the Individuals With Disabilities Education Act (U.S Department of Education, Office of Special Education Programs 2003), graduation rates for students with disabilities, although increasing, continue to be significantly lower than graduation rates of students without disabilities in traditional public schools. The report indicates that 62% of students with learning disabilities graduated with a diploma and 79% of students without disabilities graduated with a diploma. In other reports (Wagner, 1991), 28% of students with learning disabilities dropped out of high school before their fourth year. The dropout rate of students with learning disabilities are connected with factors such as lack of comprehension in core subjects and attitudinal issues (Dunn, Chambers, & Rabren, 2004; Kortering & Braziel, 2002). In addition, research shows that although employment rates for students with disabilities are increasing (45%), they continue to lag behind the rates of students without disabilities (63%) (Wagner, 2005).

Schools use different methods and educational philosophies to close the achievement gap between students with disabilities and their non-disabled peers. Federal enactments have mandated public schools to provide free and appropriate education for all students to prevent issues such as high dropout rates, low comprehension of core topics, and negative attitudes in the US (Kortering & Braziel, 2002; Wagner, 2005). However, most public schools have had difficulty improving such issues for students with disabilities (Dunn et al., 2004).

Researchers had different findings about the effects of inclusive education on both students with and without disabilities. Smoot (2011) conducted a study to measure how much general education peers socially accepted the students with disabilities in the general education setting. The participants of the study included 61 students with disabilities and their 286 general education peers. The findings indicated that there was no statistically significant difference in acceptance by gender of the student. In addition, only 43% of the students with disabilities were chosen by a non-disabled peer to work together. The study also suggested that having peer interactions resulted in higher understanding of students with disabilities as well as lower levels of negative attitudinal incidents in inclusion.

Conversely, Kalambouka, Farrell, Dyson, and Kaplan (2007) conducted research to examine manuscripts published on the impact of inclusive education (conceptual understanding, attitudes, and social outcomes) on students without disabilities. Researchers initially had a pool of 7,137 papers, which were identified through electronic databases. After having screened all journal titles and abstracts, they marked out 119 journal articles. They then conducted further examination and reduced the numbers of articles to 26. After all extraction and synthesis process of articles, researchers obtained 71 findings from 26 different studies. The results indicated that there were no adverse effects of inclusion on students without disabilities and their disabled peers. Overall results suggested that 81% of the outcomes of inclusion were positive or neutral on attitudes and social outcomes of all students. However, 9% of findings suggested that inclusive education had a negative impact on attitudes and social outcomes of all students.

Siperstein, Parker, Bardon, and Widaman (2007) conducted a study to investigate the attitudes of students without disabilities toward inclusion of peers with intellectual disabilities. The participants included 5,837 middle school students from 47 school districts from 26 states. The findings suggested mixed results about the impact of inclusion on the population of students without disabilities. Researchers claimed that students without disabilities viewed inclusion as having both positive and negative effects on their comprehension and attitudes. Only 38% of these students reported having a schoolmate with disabilities, and about 10% of them reported having a current classmate with disabilities. In addition, students without disabilities had limited contact with students with disabilities, did not want to socially interact with them outside school, and exhibited negative attitudes towards them.

Smoot (2004) conducted a study that involved a simple sociometric assessment technique - a measurement that measures social interactions and relationships within a peer group - to measure how much students without disabilities socially accepted the students with disabilities in general education settings. The participants included 61 students with disabilities and 286 students without disabilities from five middle schools, two high schools, one elementary school, and one preschool. The total population in all five schools was 18,112 students. The findings suggested that only 43% of the students with disabilities were being preferred by their non-disabled peers. Conversely, students without disabilities preferred each other 85% of the time in inclusive settings.

Social Learning Theory

In formulation of a theoretical perspective for studying the attitudes of students without disabilities in inclusion, social learning theory provides a useful prototype. Basically, this unified theoretical framework approaches the explanation of human attitudes in terms of reciprocal (continuous) interaction between cognitive, attitudinal, and environmental determinants (Bandura, 1989). Social learning theory posits that human agents learn from each other by imitation, modeling, and observation (Bandura, 1989). Bandura (2001) stated that individuals do not need to learn everything directly because they can learn many things by observing other people's experiences. After the observation, the information gained through modeling and imitations are restored in a timely manner to serve as a guide for our actions (Grusec, 1992). By applying social learning theory to this scholarly research, environmental determinants of continuous human interactions will be explained according to the social interactions among students (with and without disabilities) in an inclusive setting, in which they may result either in positive or negative social attitudes.

Although several studies have been conducted on inclusive education and its effects on students with disabilities in public schools, research that examines the effects of inclusive education on the population of students without disabilities in such schools is limited. The absence of research on how inclusive education affects the general education population in public middle schools is worthy of study and analysis. The purpose of this study is to analyze the effects of inclusive education on the general education population of middle school students' attitudes. Therefore, a quantitative study was designed to answer the following research questions:

1. How does inclusive education affect the attitudes of general education students toward students with learning disabilities in 6^{th} grade classrooms?

2. How does inclusive education affect the attitudes of general education students toward students with learning disabilities in 7^{th} grade classrooms?

3. How does inclusive education affect the attitudes of general education students toward students with learning disabilities in 8^{th} grade classrooms?

Methods

Model

The research sample was selected using a non-equivalent groups design such that participants of the study were not randomly assigned to conditions (Gay, Mills, & Airasian, 2006). This design was considered to be quasi-experimental rather than experimental because it included non-random samples of one control group (non-inclusive) and one experimental group (inclusive) (Gay et al., 2006). In the study, the researcher manipulated the classroom arrangements by assigning 20 students without disabilities to non-inclusive classrooms and 20 students without disabilities and two students with disabilities to inclusive classrooms. The researcher collected data from both students without disabilities and students with learning disabilities.

Setting and Participants

This study took place in a middle school in a large urban school district in the US. The school was composed of 479 students of which 63% of the population was Hispanic and 12% was African-American. The school was also listed as 83% economically disadvantaged (on free and reduced lunch due to qualifying with limited income). The school included

approximately 4% of students with special needs. It implemented inclusion in a few classes. Most of the students with special needs received their education in a resource room. For the inclusive and non-inclusive science classrooms, the researcher manipulated the classroom arrangements for this study. The study was implemented in two Grade 6, two Grade 7, and two Grade 8 science classrooms. For each grade level, there was one inclusive science classroom and one non-inclusive science classroom. The participants of this study included 20 students without disabilities in each classroom with a total number of 120 students from a total of six different middle school classrooms. The study included two classrooms (one inclusive and one non-inclusive) for each grade level (6, 7, and 8). About 60% of the participants were Hispanic, 50% were male, and 80% received free or reduced lunch. In addition, participants' ages ranged from 11 to 15 years.

Data Collection Tools

The attitudes of students without disabilities towards students with disabilities were measured by the *Inclusion Survey for Middle School Students* in inclusive classrooms in a public middle school. The instrument was developed by Aragon (2007) to assess the attitudes of students without disabilities towards students with disabilities in inclusive middle school classrooms. The survey was pilot-tested with 15 middle school students to determine the readability and suitability for middle school students. Aragon (2007) calculated the coefficient alpha (Cronbach, 1951) to assess the reliability of the instrument with her sample and found it as 0.73. The researcher of this study also conducted a pilot testing and found that the Cronbach's alpha (α) value for this survey was .83, which indicated a strong reliability ($\alpha \geq 0.70$). Including the first two questions that solicited students' demographic information and the next two questions that asked for students' previous experiences with students with disabilities either in their home or school settings, the survey included a total of 30 questions. The remaining 26 questions were written as statements using a 5-point Likert scale, with 1 indicating strong disagreement, 2 indicating disagreement, 3 indicating neither disagreement or agreement, 4 indicating agreement, and 5 indicating strong agreement.

Data Analysis

For the data collection, answer sheets were used for both students with and without disabilities during the 2013-2014 school year. The researcher collected data from both students without disabilities and students with learning disabilities. The researcher did not analyze data and communicate the findings from students with learning disabilities because this study focused on the effect of inclusive education on students without disabilities. SPSS 20.0 was used for descriptive and inferential statistical analysis. First, the researcher ran an independent-samples *t*-test to determine the sample mean differences on attitudes (pre-test) in both groups. Second, a paired samples (dependent) *t*-test was conducted to examine significant differences on attitudes (pre-test and post-test) within inclusive classrooms and independently for non-inclusive classrooms. Third, a multivariate group analysis test was conducted to investigate significant differences in attitudes (pre-test and post-test) of students between inclusive and non-inclusive classrooms.

Results

Twenty students without disabilities from each classroom were tested on the survey for each grade level. Table 1 shows mean scores on the pre-survey and post-survey measures. The mean score for the students in the 6th grade inclusive science classroom was 3.60 (*SD* = *.57*) on pre-survey test and 3.42 (*SD* = *.55*) on the post-survey test. Students in the 6th grade non-inclusive classroom had a lower mean score of 3.38 (*SD* = *.45*) on both pre-survey test

and 3.22 (*SD = .42*) post-survey test compared to students in the 6th grade inclusive science classroom. Students in the 7th grade inclusive science classroom had a mean score of 3.55 (*SD = .37*) on pre-survey test and 3.41 (*SD = .56*) on the post-survey test. Alternatively, students in the 7th grade non-inclusive classroom had a lower mean score of 3.52 (*SD = .25*) on both pre-survey test and 3.32 (*SD = .33*) post-survey test compared to students in the 7th grade inclusive science classroom. Students in the 8th grade inclusive science classroom had a mean score of 3.47 (*SD = .44*) on the pre-survey test and 3.19 (*SD = .44*) on the post-survey test. Students in the 8th grade non-inclusive classroom had a higher mean score of 3.66 (*SD = .33*) on both the pre-survey test and 3.21 (*SD = .54*) post-survey test compared to students in the 8th grade inclusive science classroom.

Table 1. *Summary of ranges, means, and standard deviations for ISMSS scores*

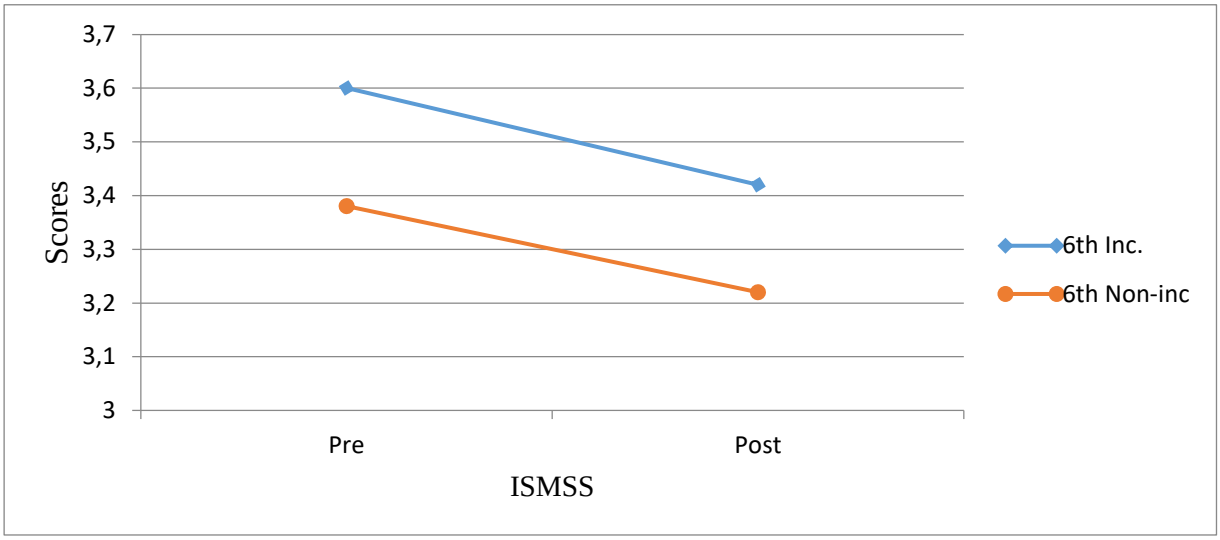
		Pre		Post	
Group	*n*	Min-Max	*M (SD)*	Min-Max	*M (SD)*
6th Inc.	20	2.77-4.65	3.60 (.57)	2.50-4.54	3.42 (.55)
6th Non-inc.	20	2.69-4.27	3.38 (.45)	2.62-4.15	3.22 (.42)
7th Inc.	20	2.92-4.19	3.55 (.37)	2.12-4.46	3.41 (.56)
7th Non-inc.	20	3.15-4.08	3.52 (.25)	2.77-4.54	3.32 (.33)
8th Inc.	20	2.69-4.58	3.47 (.44)	2.46-4.27	3.19 (.44)
8th Non-inc.	20	3.04-4.23	3.66 (.33)	2.23-4.50	3.21 (.54)

Note. ISMSS = The Inclusion Survey for Middle School Students. This construct consisted of 26 Likert scale items with a possible score of 1-5, Inc. = Inclusive, Non-inc. = Non-inclusive.

6th Grade Inclusive and Non-Inclusive Classrooms

The independent samples *t* test showed whether there were any significant changes between 6th grade students without disabilities in an inclusive classroom and those in a non-inclusive classroom about their attitudes towards students with disabilities on pre-survey tests. Levene's test resulted in no violations being observed among sample variances about the experiences of students without disabilities towards students with disabilities ($p = .21$). This test showed that the variances from different groups were normally distributed and that we can have confidence in the validity of our *t* test result for pre-survey test and post-survey test.

A paired samples *t* test was conducted to examine significant differences on attitudes (pre-survey test and post- survey test) of 6th grade students without disabilities within inclusive and independently for non-inclusive classrooms. The test results indicated that there was not a significant difference in the scores of 6th grade students without disabilities within inclusive science classrooms for pre-survey ($M = 3.60$, $SD = .57$) and post-survey ($M = 3.42$, $SD = .55$) conditions, $t(19) = 1.82$, $p = .08$. In addition, a paired samples *t* test was conducted to examine significant differences on attitudes (pre-test and post-test) of 6th grade students in non-inclusive classrooms. There was not a significant difference in the scores of 6th grade students without disabilities within non-inclusive science classrooms for pre-survey ($M = 3.38$, $SD = .45$) and post-survey ($M = 3.22$, $SD = .42$) conditions, $t(19) = 1.19$, $p = .25$. Figure 1 shows the comparison in mean scores between students in 6th grade inclusion and 6th grade non-inclusion on surveys.



Note. ISMSS = The Inclusion Survey for Middle School Students, Pre = Pre-survey, Post = Post-survey, Inc. = Inclusive, Non-inc. = Non-inclusive.

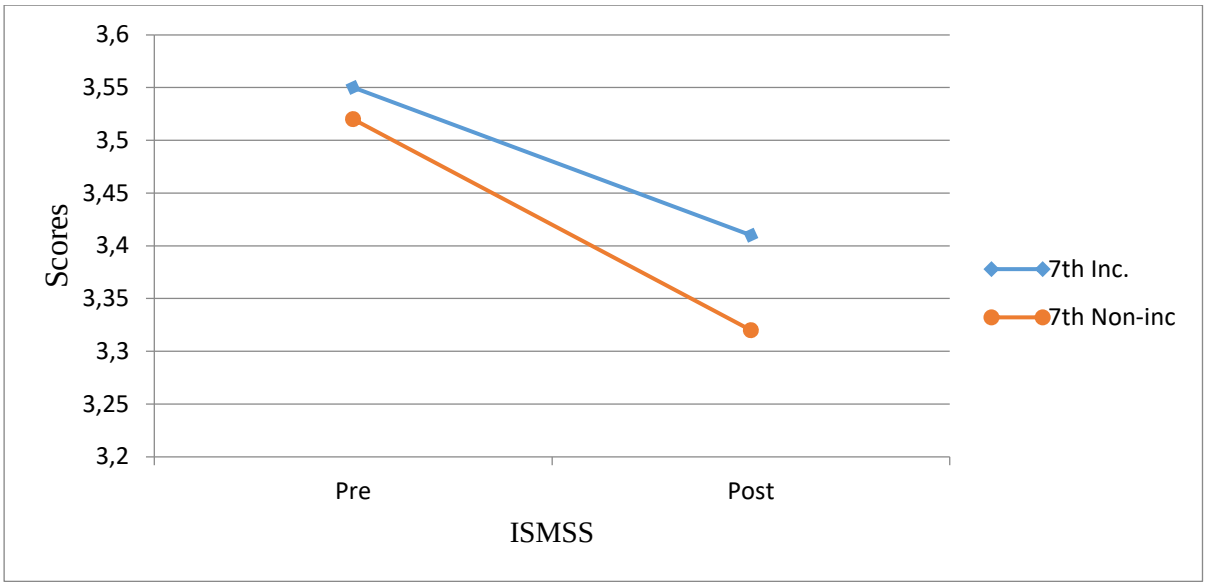
Figure 1. *Comparison in mean scores between students in 6th grade inclusion and 6th grade non-inclusion on ISMSS scores*

The multivariate group analysis tests indicated whether there were any significant changes in means on pre-survey and post-survey tests on attitudes between 6th grade students in inclusion and students in non-inclusion. The results suggested that there was no significant change on pre-survey $F(1, 38) = 1.74$, $M\Delta = .21$, $p = .19$, $\eta^2 = .04$ with observed power of .25 and post-survey tests on attitudes $F(1, 38) = 1.71$, $M\Delta = .20$, $p = .19$, $\eta^2 = .04$ with observed power of .25 between 6th grade students in inclusion and students in non-inclusion.

7th Grade Inclusive and Non-Inclusive Classrooms

The researcher conducted an independent samples *t* test to show whether there were any significant changes between 7th grade students without disabilities in inclusion and those in non-inclusion about their attitudes towards students with disabilities on pre-survey tests. The Levene's test indicated that equality of variances were not assumed on pre-survey tests on attitudes (p=.01) for 7th grade students without disabilities in inclusive science classroom and students without disabilities in non-inclusive science classroom. The Levene's test showed that the variances from different groups were not normally distributed and that we should proceed with caution to analyze further data.

A paired samples *t* test was conducted to examine significant differences on attitudes (pre-test and post-test) of 7th grade students without disabilities within inclusive and independently for non-inclusive classrooms. The results suggested that there was not a significant difference in the scores of 7th grade students without disabilities within inclusive science classrooms for pre-survey ($M = 3.55$, $SD = .37$) and post-survey ($M = 3.41$, $SD = .56$) conditions, $t(19) = .90$, $p = 0.38$. In addition, the paired samples *t* test indicated that there was a significant difference in the scores of 7th grade students without disabilities within non-inclusive science classrooms for pre-survey ($M = 3.52$, $SD = .25$) and post-survey ($M = 3.32$, $SD = .33$) conditions, $t(19) = .3.22$, $p = 0.004$. Figure 2 shows the comparison in mean scores between students in 7th grade inclusion and 7th grade non-inclusion on surveys.



Note. ISMSS = The Inclusion Survey for Middle School Students, Pre = Pre-survey, Post = Post-survey, Inc. = Inclusive, Non-inc. = Non-inclusive.

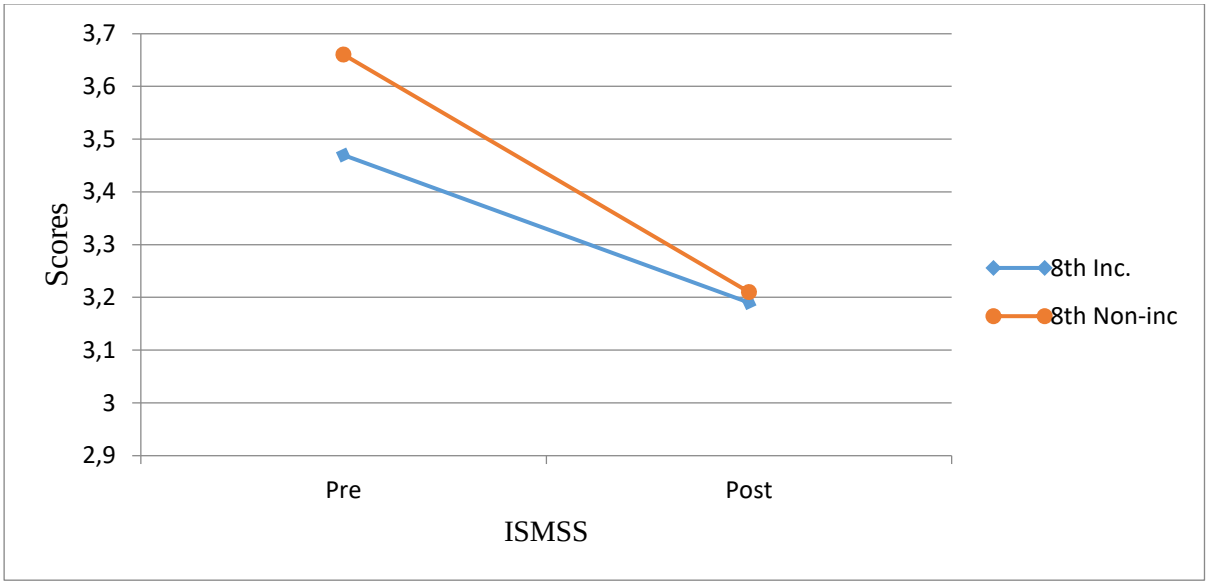
Figure 2. *Comparison in mean scores between students in 7th grade inclusion and 7th grade non-inclusion on ISMSS scores*

The multivariate group analysis tests suggested that there was not a significant change in means on pre-survey test $F(1, 38) = .04$, $M\Delta = .02$, $p = .83$, $\eta^2 = .00$ with observed power of .05 on attitudes between 7th grade students in inclusion and students in non-inclusion. The mean scores on pre-survey test was the lower than post-survey. In addition, there was no significant change in means on post-survey test $F(1, 38) = .42$, $M\Delta = .09$, $p = .52$, $\eta^2 = .01$ with observed power of .09 on attitudes between 7th grade students in inclusion and students in non-inclusion.

8th Grade Inclusive and Non-Inclusive Classrooms.

The independent samples *t* test showed that Levene's test for equality of variances were assumed on pre-survey test scores on attitudes ($p = .35$) for 8th grade students without disabilities in inclusive science classroom and students without disabilities in non-inclusive science classroom. This test showed that the variances from different groups were normally distributed and that we can have confidence in the validity of our *t* test result for pre-survey tests and post-survey tests.

A paired samples *t* test was conducted to examine significant differences on attitudes (pre-test and post-test) of 8th grade students without disabilities within inclusive and independently for non-inclusive classrooms. The results suggested that there was a significant difference in the scores of 8th grade students without disabilities within inclusive science classrooms for pre-survey ($M = 3.47$, $SD = .44$) and post-survey ($M = 3.19$, $SD = .44$) conditions, $t(19) = 6.06$, $p < .001$. In addition, the paired samples *t* test results showed that there was a significant difference in the scores of 8th grade students without disabilities within non-inclusive science classrooms for pre-survey ($M = 3.66$, $SD = .33$) and post-survey ($M = 3.21$, $SD = .54$) conditions, $t(19) = .3.06$, $p = 0.006$. Figure 3 shows the comparison in mean scores between students in 8th grade inclusion and 8th grade non-inclusion on surveys.



Note. ISMSS = The Inclusion Survey for Middle School Students, Pre = Pre-survey, Post = Post-survey, Inc. = Inclusive, Non-inc. = Non-inclusive.

Figure 3. *Comparison in mean scores between students in 8th grade inclusion and 8th grade non-inclusion on ISMSS scores*

The multivariate group analysis tests showed the mean scores on attitudes between 8th grade students without disabilities in inclusion and students without disabilities in non-inclusion on pre-survey and post-survey test. The multivariate group analysis tests indicated that there was no significant difference in mean scores on pre-survey test $F(1, 38) = 2.64$, $M\Delta = .20$, $p = .11$, $\eta^2 = .06$ with observed power of .35 on attitudes of students without disabilities. Results also indicated that there was no significant difference in mean scores on post-survey test $F(1, 38) = .01$, $M\Delta = .02$, $p = .91$. $\eta^2 = .00$ with observed power of .05 on attitudes between students without disabilities in inclusion and those in non-inclusion.

Discussion

This quantitative study focused on the attitudes of students without disabilities towards students with disabilities in the same setting through three research questions. The overall range of mean scores on attitudes for all students in both inclusive science classrooms and those in non-inclusive science classrooms was 3.38 – 3.66 from pre-survey test and 3.19 – 3.42 from post-survey test. Considering a score of 3.00 on attitudes as a neutral point on the Likert scale, all students without disabilities from both inclusive classrooms and non-inclusive classrooms from each grade level demonstrated slightly positive attitudes towards students with learning disabilities on pre-survey test and post-survey test. The researcher/teacher observed that students without disabilities in both classroom settings exhibited social embracing towards students with learning disabilities. This finding supports the study of Kalambouka et al. (2007) on the impact of placing students with special education needs in general education classrooms and their effect on the attitudes of students without disabilities. They found that the effect of students with disabilities on their non-disabled peers was neutral or positive 81% of the time.

With respect to student attitudes, 6th grade students without disabilities in the inclusive science classroom had a lower mean score ($p = .08$) between pre-survey test and post-survey

test. This result showed that there was a non-significant relationship between the effect of inclusive science education and attitudes of general education students toward students with learning disabilities. In addition, 6th grade students without disabilities in non-inclusive science classroom had a lower mean score (p = .25) between the same measures. The researcher/teacher observed that although students without disabilities did not have negative attitudes towards those with learning disabilities regardless of classroom setting, they preferred to establish interactions with students with the same abilities. This finding supports the study of Agne (1999). She found that students without disabilities remained under-challenged, bored, and disengaged when the teacher spend most of his time and effort to provide assistance to students with learning disabilities. The researcher/teacher observed that this may be the reason why students without disabilities did not prefer to work with students with learning disabilities in scientific learning activities.

It was interesting to find that 6th grade students without disabilities in the inclusive science classroom had a higher mean score in attitudes (p = .19) on post-survey test compared to those in the 6th grade non-inclusive science classroom. The researcher/teacher observed that although students without disabilities did not establish a meaningful engagement in science lessons, they exhibited positive social interactions with their disabled peers in the inclusive science classroom compared to students without disabilities in non-inclusive science classroom. This supports the findings of Downing and Peckham-Hardin (2007). They found that inclusive education is beneficial for students without disabilities as it improves their attitudes towards students with learning disabilities. Another reason observed by the researcher/teacher was that students without disabilities knew that they had to construct social relationships with their disabled peers as they all had to work together and communicate while in groups conducting experiments in inclusive science classroom. This finding follows the study of Ferguson, Hanreddy, and Draxton (2011). They found that students without disabilities improved their social skills with their disabled peers as they all took part in everyday learning experiences.

Students without disabilities in the 7th grade inclusive science classroom had a lower mean score (p = .38) between the pre-survey test and post-survey test. This result showed that there was a non-significant relationship between the effect of inclusive science education and attitudes of general education students toward students with learning disabilities. In addition, 7th grade students without disabilities in the non-inclusive science classroom had a lower mean score (p = 0.004) between the same measures. The researcher/teacher observed that students without disabilities preferred to engage in learning activities with their non-disabled peers than their disabled friends regardless of the classroom setting. This finding supports the study of Agne (1999). She found that students without disabilities preferred maintaining more social interactions with their non-disabled friends than those with disabilities in learning via group work.

An interesting finding was that 7th grade students in the inclusive science classroom had a higher mean score on attitudes (p = .52) from post-survey test compared to those in the 7th grade non-inclusive science classroom. The researcher/teacher observed that although students without disabilities were less engaged in science learning, they established more friendships with students with learning disabilities than those in non-inclusive science classrooms. This follows the findings of Ferguson et al. (2011). They found that students without disabilities in inclusive settings construct more meaningful relationships with their disabled peers than comparable students in non-inclusive settings.

Analyzing the student attitudes, 8th grade students without disabilities in the inclusive science classroom had a lower mean score (p < .001) between the pre-survey test and post-

survey test. This significant result showed that there was a significantly negative relationship between the effect of inclusive science education and attitudes of general education students toward students with learning disabilities in an inclusive classroom. The researcher/teacher observed that engaging in science learning with disabled students did not positively change the feelings of students without disabilities toward students with learning disabilities in the inclusive classroom. This finding supports the study of Siperstein et al. (2007). They found that although students without disabilities and their non-disabled peers worked together in classroom activities, only 10% of them established friendships in the inclusive classroom. Moreover, they did not want to socially interact outside of their classrooms. In addition, 8th grade students without disabilities in non-inclusive science classroom had a lower mean score (p = 0.006) between the same measures. The researcher/teacher observed that non-disabled students' lack of knowledge about their disabled peers might have contributed to their negative feelings towards disabled students. This finding supports the study of Marchant (1990) on useful resources for learning disabled students. He found that lack of knowledge about students with learning disabilities may dictate negative feelings of fellow students toward them.

It was interesting to find that 8th grade students in the inclusive science classroom had a slightly lower mean score on attitudes (p = .91) compared to those in the 8th grade non-inclusive science classroom. The researcher/teacher observed that due to classrooms procedures, students without disabilities in the inclusive science classroom had to work and collaborate with students with learning disabilities in classroom activities even though they preferred working with their non-disabled peers. This finding supports the study of Downing, Spencer, and Cavallaro (2004) on the development of an inclusive elementary school. They found that although inclusive education improved the conceptual understanding of students without disabilities, it did not improve their attitudes towards students with learning disabilities.

This study includes several limitations. Consideration must be given to limitations of the study and the impact it may have had on the results. The first limitation involves the lack of random sampling. This limitation was evident as this study was a nonequivalent quasi-experimental study. The failure to randomize in sampling can cause a researcher not to be able to create a true experimental study environment that includes internal validity threats. A second limitation involves a limited number of students with disabilities in the inclusive science classrooms. Increasing the number of students with disabilities in inclusive classrooms might have a positive or a negative effect on the conceptual understanding and attitudes of students without disabilities (Mastropieri et al., 2006). In their study, Downing et al. (2004) found that inclusion of students with disabilities did not improve the attitudes of students without disabilities. However, Ferguson et al. (2011) indicated that it may create positive social relationships among all students. The third limitation includes the reality that the size of the study precludes some generalization regarding the study. The relatively small sample and the fact that the sample was recruited from a single public school limits generalization somewhat, although it was representative of the schools in the Midwestern U.S. The ability to generalize may have been limited further as the sample size was reduced to create greater uniformity between the comparison and sample groups.

Some recommendations for this study the following suggestions: research how using a population of students with moderate or severe disabilities in inclusive classrooms may affect the conceptual understanding and attitudes of students without disabilities; research using a larger sample size to be able to generalize the findings; research using a mixed methodology for more detailed effects of inclusive education; and compare the effect of inclusive education on students without disabilities between elementary and middle levels at public schools.

In conclusion, the literature review for this scholarly research indicated that students without disabilities and those with disabilities may have a positive or a negative effect on one another's attitudes. However, the overall findings of this study itself indicated that inclusive education had a negative effect on the attitudes of students without disabilities towards their peers with disabilities in public middle school classrooms.

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