

ETC 693 Master Project

**Self-Assessment: A differentiated approach to student engagement in
mathematics**

Eric Miles Holmstrom

Submitted to the
Graduate School of Education
City University of Seattle
In Partial Fulfillment of the Requirements
For the Degree of Master in Teaching

I give permission to City University to store and use this MIT Project for teaching purposes.

Submitted by Eric Holmstrom _____
Candidate's Name Date

Approved by Vicki Butler _____
Advisor's Name, Abbreviated Degree(s) Date

Approved by _____
Sue Seiber, Director TCP. Date

Self-Assessment: A differentiated approach to student engagement in mathematics

E.M. Holmstrom

Graduate School of Education

City University, Seattle

In Partial Fulfillment of the Requirements for the Degree of Master in Teaching.

Table of Contents

Acknowledgements	4
Abstract	5
Introduction	6
Problem Statement	6-7
Rationale	7-8
Literature Review	8-11
Purpose	12
Research Question	12
Methodology	12-17
Results	17-20
Discussion	21-22
References	23-24
Appendix A: Student Self-Assessment Form	25

Acknowledgements

I would like to acknowledge and thank my research supervisors during this project, Vicki Butler and Brody LaRock, for your guidance throughout the process. In addition, I would like to thank my mentor teacher for allowing me to implement this program in his classroom along with all of his support and advice. Lastly, I would like to thank the parents and children who allowed me to complete this research. I hope I have made a positive impact on all of the bright minds that were part of this research.

Abstract

This action research study examined the effectiveness of using self-assessment as a strategy for engaging fifth grade students with emotional or behavioral disabilities. The complexity of these issues combined with multiple layers of understanding math (concepts, procedures, problem-solving, and vocabulary) provide ample reasons to discover a teaching strategy that works. The self-assessment model was implemented during a two-week span where students developed mastery of classifying two-dimensional figures and converting units of measurement. As a daily practice, students recorded their own perceived level of engagement as well as the work they were able to collect. This data was compared to the teachers perceived level of engagement as well as distracting behavior and missing assignments (disengagement).

Introduction

This research project is designed to address classroom engagement from students who have emotional or behavioral disorders (EBD) as it pertains to the study of mathematics. Students who exhibit attributes of EBD may struggle to remain engaged during a lesson or throughout the school day (Lukowiak, 2010). The focus of this project is to investigate whether a student self-assessment model can eliminate incomplete work and missing assignments. This action research project uses self-assessment to cater to the needs of individual students and is not a “one-size-fits-all” strategy for engagement. For this action research project, self-assessment provides an opportunity for each student to define their level of engagement as well as propose a solution for any lack of engagement. Furthermore, self-assessment can be applied to any subject in school. For the sake of this study, engagement is measured by participation, lack of distraction, and the amount of work a student is completing during a lesson. The purpose of this project is to determine whether or not self-assessment is a viable strategy for improving student engagement in math.

Problem Statement

The problem with engaging students with EBD, as observed by the researcher, is that the disorders range in severity and chronicity. The behaviors associated with these disorders may be prevalent throughout the day or at specific times; they may result in the student withdrawing from the class or distracting the class (Nelson, Benner, Lane, and Smith, 2004). As observed in the study classroom, when a student with EBD distracted the class during a lesson this could lead to disengagement for the entire class. These behaviors can be exemplified during math due to the complexity of formulas and abstract

representations of using symbols, words and numbers. In addition, math can be vocabulary intensive (Nelson et al, 2004).

Rationale

The reason this research focuses on engagement is due to the fact that students who participate and complete work in class have less missing assignments and higher grades. There is a significant correlation between high levels of engagement and improved attendance and achievement (Jablon and Wilkenson, 2006). The self-assessment strategy is important because it is designed to meet each students needs and it develops a skill that they can use throughout life (Pintrich and De Groot, 1990). Being able to monitor ones actions (or lack thereof) is necessary for being successful in school and the work place (Lukowiak, 2010).

In addition, this project aligns with state learning standards. In Washington State Common Core Standard, SL.5.1, students are required to... Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher- led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly" (National Governors Association Center for Best Practices, 2010). This research meets the content indicated in this learning standard by increasing student engagement in everyday lessons as well as developing engagement skills.

The second learning standard that this research study addresses is SL.5.4... Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace (National Governors Association Center for Best

Practice, 2010). In order to meet the criteria of this standard, all students need to be able to engage in classroom and peer discussions.

Both of these learning standards are based on the Washington Common Core Standards for Language Arts, but they also apply to mathematics. To show full understanding, students need to be able to discuss and explain answers during peer and group discussion on math concepts and procedures (Jablon and Wilkenson, 2006). In order to participate in these discussions the students must be engaged.

Literature Review

Engagement

Successful teaching revolves around student engagement. Effective student engagement focuses children on learning, supports learning of specific skills and concepts and provides positive associations with learning (Jablon and Wilkenson, 2006). Studies show that students begin educational disengagement as early as third grade and these patterns can grow as students grow older (Rossi and Montgomery, 1994).

One effective engagement strategy is student-centered learning. Student-centered instruction provides students the opportunity to learn 21st century skills including communication, problem solving and critical thinking (Walters, Smith, Leinwand, Surr, Stein and Bailey, 2014).

Metacognition

Metacognition defines the process involved when learners understand and can evaluate their own learning (Somerville, 2017). There are two components of metacognition. The first, metacognitive knowledge, refers to an individual's ability to identify what they know and what they do not know, or what they struggle with

(Somerville, 2017). The second, metacognitive regulation, refers to the process individuals use to promote their learning (Somerville, 2017). An example of this is a student who knows that an algorithm is confusing for them, so they try to draw a picture to solve the problem instead.

Metacognition is necessary in order to self-regulate and monitor. A study completed by Delclos and Harrington showed that fifth and sixth grade students who utilized a self-monitoring (self-assessing) model while developing problem solving skills in math showed higher average test scores than their peers (1991). In addition, other research supports the findings of Delclos and Harrington. Self-regulated learning (metacognitive regulation) was the treatment in a study that showed positive classroom performance for seventh and eighth grade students (Pintrich and De Groot, 1990).

Teaching Special Education

After identifying a student's needs in terms of special education (Individualized Education Plan (IEP), Behavioral Intervention Program (BIP), and other forms of intervention), it is required by Individuals with Disabilities Education Act (IDEA) that a school and teacher provide the student with a Least Restrictive Environment (LRE). There is ample research that identifies effective teaching strategies for students with EBD. According to Twila Lukowiak (2010) of Bradley University, it is essential for all individuals who work with a student (with EBD) to understand what special needs the student has and what teaching methods work with that particular student. This includes teachers, para-educators, school administrators and special education supervisors (Lukowiak, 2010). Several effective strategies for teaching students with EBD include

earned activities (positive reinforcement), ignoring inappropriate behavior, establishing consistent routines, and setting well-defined boundaries (Lukowiak, 2010).

A recent study on effective teaching methods for students with EBD revealed that individual and small-group work was most beneficial for those students (Vaughn, Levy, Coleman, & Bos 2002). This was based on control group of students with varying reading levels (variation of 3 grade levels). The students had higher levels of growth when they were able to spend 20% of their time, one-on-one with an aid or teacher (Vaughn et al, 2002). In fact, a synthesis of previous studies showed that a significant emphasis has been put on individual and small group work since the mid 1990's (Vaughn et al, 2002).

Lastly, teacher behavior and classroom context can also determine the successful education of a child with EBD. Studies show that students, who have poor relationships with their teachers, caused by behavior, in the primary grades show deficiencies in academics as far as eighth grade (Sutherland, Lewis-Palmer, Stichter & Morgan, 2008). Positive outcomes for students with EBD have been measured in classrooms where teachers do not emphasize consequences, but attempt to control behavior through positive reinforcement (Sutherland et al, 2008). In comparison, aggressive management was shown to increase poor relationships with students who were at risk for emotional and behavioral disorders.

Student Success

Attaining the goal of reaching student success can be more difficult with students with EBD. Researchers Nelson, Benner, Lane, and Smith (2004) set out to determine the rates at which EBD students experience deficits across core areas (i.e. language arts and mathematics). The results indicated that despite gender and age, students with EBD

experienced academic hardships in all core areas, including worse cases in mathematics (Nelson et al, 2004). The sample of 155, K-12 students with EBD showed deficits in both written language and math. The study conducted a broad writing and broad math exam to calculate the rates at which these students experienced these deficits. From the results, the students varied in their deficits from 25% to 97% below the grade average (Nelson et al, 2004).

Another consideration is changing placement for students with learning and emotional/behavioral disabilities. According to Buchanan, Nese, and Clark (2016), transitions between individual care and education to a general education classroom is a “confusing” and “frustrating” process for students with EBD. In order for students to be successful in transitions, general education teachers, special education teachers, para-professionals and parents must all be on the same page and supportive of the students’ needs (Buchanan et al, 2016).

Patton, Bond, Carlin, Thomas, Butler, Glover, Catalano, and Bowes (2006) recorded what happened when teachers failed to meet the needs of students with EBD. This study showed that EBD students who failed to meet educational needs expressed higher levels of antisocial behavior, substance abuse and sexual activity (Patton et al, 2006). Data for this study was collected in three different years, 1997, 1999, and 2001 on 8th grade students. In addition, improved inclusion and acceptance leads to lower dropout rates with students with learning disabilities and emotional/behavioral disorders (Reschly & Christenson, 2006.)

Purpose

The purpose of this study was to examine the effects of self-assessment on student engagement as measured by the number of missing assignments during a two-week period in a fifth grade math class. A self-assessment is a student's interpretation of his or her own level of engagement. For this study, engagement was defined as participating the class, group or peer discussion, and completing the task that is assigned. The math lessons were divided into two sections. One is class work based on a curriculum book and the other is practice pages that the students take home as homework to be graded and revised the following day. Students were held responsible to complete both of these assignments, as they are crucial for developing conceptual, procedural and problem-solving skills in math. As the year progressed, students had not completed the workbook assignments or the practice pages, which had resulted in missing assignments. The purpose of this study was to see if student self-assessment would be a successful strategy to engage students and decrease the number of incomplete work and missing assignments.

Research Question

Will using student self-assessment be effective in engaging 5th grade students with EBD in math and will this engagement reduce the number of incomplete bookwork and missing math assignments?

Methodology

Context

This action research study was conducted in a 5th grade classroom. The class is part of a school that is a suburb of one of the largest urban areas in Washington, and has a

variety of students of different socioeconomic backgrounds. Some of the low-income families work in the rural areas outside of the city limits and the higher income families work within town or in the State capital. The elementary school has a free and reduced lunch rate of 33.4%. The school building is brand new and includes technology and programs designed to scaffold the traditional model of academics. An example of this technology is a computer lab where students can work on keyboarding and computer skills, a technology room where students learn to use word processing and presentation software, and each student has a Chrome Book in the classroom for personal use. Furthermore, the school has a resource room and several quasi-classrooms set up in the halls to accommodate small groups. These small group areas include desks, chairs, and a smart board.

Participants

The fifth grade class where this study is conducted is made up of 14 boys and 12 girls for a total of 26 students. The students in this classroom are between the ages 11-12. There are two students with an IEP, two with 504 plans including one who receives special education as an English language learner. One of the students with an IEP also has a BIP in place for which he has a daily record of his participation that is filled out by all of his instructors. The students in this 5th grade class range from highly capable in certain subjects to below grade level in others. There is one student who is highly capable in math and three who are above level in writing. Most of the class is at or approaching standard in both math and ELA. The class curriculum includes math and ELA every day with science and U.S. History alternating between units.

Intervention

The intervention for this action research project is a self-reporting method for activating engagement from students with EBD. The purpose of this intervention is to develop a strategy to improve the participation and engagement from students who may otherwise not actively participate on their own. The plan is to develop a self-reporting form that the students will complete if they were caught “checking out.” “Checking out” in this case means the students no longer appeared to be engaged. Instead, they might be looking out the window, playing with their pencil, or putting their heads down.

Data was collected during this period using a self-assessment form (See Appendix A). The forms were handed to each student at the beginning of the math lesson and expected back by the end of the day. There was a place on the form for the student to self-identify their engagement on a scale from 1 to 10. Next to that was a place for the teacher to identify their perception of the student’s engagement based on the amount of participation or work that had been completed. If there were a discrepancy in the form, the teacher would meet with the student to discuss their engagement or lack of complete work.

The purpose of the meeting is to discuss the lack of engagement and make corrective decisions. Discussed in this meeting was the amount of work completed and a possible plan to reduce this behavior in the future. At the end of the meeting, both the student and the teacher signed the form to agree on the discussion following the meeting. Options to improve engagement included the choice to “do/absorb,” move seats, or clear the student’s desk before the lesson began.

Observation

The first stage of this study was the observation period. During the first week that the study was implemented, the teacher observed and recorded student behavior that was linked to disengagement. The teacher took notes of these behaviors to serve as a tool for identifying this behavior during the intervention period. In addition, the researcher collected baseline data on the number of missing assignments and incomplete work for each lesson.

Implementation

The second stage of this study was the implementation of the intervention. For two weeks, the self-assessment forms were handed out and completed with the meetings as stated above. In addition, the subjects covered in the mini conference were recorded and analyzed as effective or not effective methods for promoting engagement. Some of the things that were discussed included removing items from the student's desk like personal books or extra pencils, moving to the front of the classroom or turning away from the window or other distractions.

Data Gathering

The pre-assessment data was collected through observations and note taking. The students were monitored for disengaged behavior to make it easier to spot during the data collection phase. In addition, notes on missing work were collected to identify pre-existing levels of incomplete bookwork and homework. During the intervention, the data was collected as the self-assessment forms, after each math lesson.

Collecting Baseline Data. The first data set gathered for this research project was a count of each student's missing assignments. Notes on incomplete work and behavior

were collected the week prior to the intervention. These notes identified common behaviors of disengagement that affected individual students and small groups. Individual behaviors included looking out the window, reading a personal book, working ahead in the book, not asking questions or asking the teacher to slow down and explain, and playing with a pencil or another object. Some of the behavior was distracting and disengaging for both the student and the peers around him or her. This behavior included passing notes and being disruptive or talking during the lesson.

Collecting Quantitative Data. The second set of data comes from the self-assessment forms. For each math lesson, students completed a self-assessment form. The students wrote their perceived level of engagement on a scale from one to ten and the amount of work they finished (bookwork and practice pages). Notes on student engagement and participation were recorded during the lesson and compared to the students' self-assessment of engagement. This information was stored in a table for each lesson.

Validity

By using multiple forms of data, this intervention provided a wholesome approach to effective student engagement. The notes collected by the teacher on both behavior and work completion, student self-assessed levels of engagement and data tracks of missing assignments before and after the intervention all established credibility and increased the validity of this study. Per Walters et al. (2014), this intervention implemented self-assessments to give each student a student-centered approach to staying engaged during a lesson. Furthermore, giving the students control of what they will do to remain engaged during future lessons allowed them to be self-monitoring and self-motivating. These two

skills are crucial for success both in academics and in the real world (Delclos and Harrington, 1991).

Results

The data from the intervention was collected throughout the data-gathering period and collected for analysis. The data was collected as notes on student behavior, incomplete work, corrective conferences and the self-report forms completed by the students.

Baseline Data

The following table shows the notes taken during the baseline data-gathering period. These notes identify missing and incomplete work assignments and notes on disengaged behavior.

Date	Missing/Incomplete Work Assignments (Whole Class Data)	Behavioral Notes (Each quote in this column is associated with a different student.)
4/17/2018	7	<p>“Student is completely withdrawn for lesson, refusing to participate. Distracting himself with personal book, not distracting to others.”</p> <p>“Unwilling to work with his partner. Turned it around halfway and was able to complete the bookwork.”</p>
4/18/2018	4	<p>“Unreceptive to instruction, intentionally slowing down class.”</p> <p>“Disengaged, reading personal book. Completed all bookwork and practice pages.”</p>
4/19/2018	3	<p>“Drawing pictures during math. After removing the paper, he shut down and was unreceptive.”</p> <p>“Talking to (distracting) the students around him. Did not complete bookwork.”</p>

4/20/2018	5	<p>“Refusing to complete work despite one-on-one help.”</p> <p>“Staring at one problem throughout the individual work despite several reminders. Participated in the group discussion.”</p>
4/23/2018	5	<p>“Distracting himself and another student, neither student completed the bookwork.”</p> <p>“Laying head down on table, looking out the window. Not reading and answering questions as accurately as she normally does. Disengaged during discussion and reading her personal book.”</p>

Fig. 1: This table shows the number of incomplete assignments and the behaviors observed before the intervention was implemented. The data represents notes collected on the entire class.

Distracting Behavior

The notes collected during this action research showed a significant drop in distracting behavior. During the beginning of this period, observations made by the teacher showed that students chose distracting behaviors that both distracted themselves and others from learning during the math lessons. Examples of this included students talking to one-another during class discussions, passing notes and argumentative discussions about math concepts and procedures. Self-distractions were prevalent as well. Students choosing to read personal books during the math lesson, drawing pictures, or simply looking out the window evidenced this behavior.

Incomplete Work Records

Notes on incomplete work were taken each day the work was due. At the end of the lesson when the bookwork was due, students' work was checked and noted. If not complete, the work was assigned as homework. The results showed that the students in the class who exhibited emotional and behavioral disabilities were among the few who

did not show a decrease in missing assignments. These students continued to not complete their work both in class, and at home. During the nine days of implementation, there were 36 incomplete practice page assignments and 12 incomplete bookwork assignments. This resulted in 48 missing or incomplete assignments in nine days for the whole class.

Corrective Decisions and Outcomes

The last set of qualitative notes was based on corrective decisions made during the meetings with students with EBD to improve engagement. One strategy used to engage a student with EBD was to give him the choice to “do” or “absorb” at the beginning of each lesson. For this student, frustrations from the challenges in math led to distracting behavior. If the student chose to “do,” the student would be expected to complete the work during the lesson like the other students in the class. The other option, “absorb,” means that the student would listen and participate during the lesson period, but would not be expected to complete the work in class. The bookwork and the practice pages would become homework for this student. This corrective decision limited teacher perceived distracting behavior, but did not reduce the student’s number of missing assignments or incomplete work. Moving a student to the front of the room was another corrective response to improve student engagement during this action research project. The student that was moved to the front of the classroom showed improvement in two areas. This student did show improvement on completing and turning in work and reduced distracting behaviors to both self and others. Baseline data shows that both of these students had low (but accurate) perceived levels of engagement prior to the

interventions. After the corrections, both students self-identified that their engagement levels had risen.

Self-Assessment Forms

The self-assessment forms were utilized as quantitative data for this lesson. The forms showed the students self-assessed level of engagement and the amount of work they were able to complete. The forms were handed out at the beginning of each math lesson and collected at the end. Each form had a number line (1-10) for students to select their perceived level of engagement. The forms were collected for analysis.

Date	Whole Class Average Engagement Level	Students with EBD Average Engagement Level	Incomplete Bookwork	Incomplete Practice Pages	Total # Missing Work
4/24/2018	78%	70%	0	4	4
4/25/2018	79%	70%	2	6	8
4/26/2018	75%	55%	2	3	5
4/27/2018	77%	56%	4	4	8
4/30/2018	76%	50%	1	3	4
5/01/2018	72%	60%	0	3	3
5/02/2018	69%	56%	3	8	11
5/03/2018	76%	60%	1	5	6
5/04/2018	78%	51%	0	10	10

Fig. 2: This table shows the class average for self-assessment, the average self-assessment for EBD students and the number of missing assignments for each lesson.

Discussion

Conclusions

The purpose of this research project was to study the impact of using self-assessment to reduce the number of missing and incomplete assignments by using self-assessment as an engagement strategy. The data showed that the intended results were not achieved. Although the number of missing and incomplete assignments did not drop, the distracting behavior as observed by the teacher was reduced. In addition, the data showed several interesting trends.

One constant in the data shows that students with EBD self-assess their engagement lower than the class average. Students with EBD assessed their own level of engagement at about 25% lower than that of the class average. This shows that these students are, for the most part, aware of their lack of engagement. There were several instances where students with EBD misidentified their level of engagement. These misidentifications were both too high and too low. Observations, evidenced by lack of complete work, showed that periodically these students would identify their engagement at 90 or 100% percent, but had actually distracted themselves or had not put any effort forward during the period and had not finished any work. On the other hand, one student continually self-assessed himself at 10 to 20% although this student would participate in discussions, complete work and help peers throughout the lesson.

Limitations

One limitation to consider for this action research project is the lack of implementation at home. While students are held responsible to monitor their

engagement in class, there is no mode for self-assessment at home or outside of the classroom.

Another limitation of this assignment is the use of a written report form. Having an option of orally reporting may be beneficial for students who are below grade level in reading or writing.

Lastly, there is no way to tell if the process of using self-assessment limited distracting behaviors or if it was another factor in the classroom or teaching style. Teachers may automatically correct distracting behavior in class as an attempt at classroom management; this would provide results that were not attributed to the use of the self-assessment tools.

Future Implications

In the future, this strategy for improving engagement may be more successful if implemented at the beginning of the school year. As students enter a new class with new curriculum and procedures, using self-assessment may be more effective in its use. Also, using this tool (self-assessment forms) may be an effective strategy to implement student voice. If students can write comments about what challenged them and what did not challenge them, the teacher can use that to improve their teaching style and help engage students in math.

References

- Buchanan, R., Nese, R., & Clark, M. (2016) Stakeholders' voices: defining needs of students with emotional and behavioral disorders transitioning between school settings. *Behavioral Disorders*, 41(3) pp. 135-147
- Delclos, V.R., Harrington, C. (1991). Effects of strategy monitoring and proactive instruction on children's problem-solving performance. *American Psychological Association*. Vol. 83, No. 1, 35-42.
- Jablon, J.R., Wilkinson, M. (March, 2006). Using engagement strategies to facilitate children's learning and success. *Innovative Practice*.
- Lukowiak, T. (2010) Positive Behavioral Strategies for students with EBD and needed supports for teachers and paraprofessionals. JAASEP, Bradley University. Pp. 40-52
- National Governors Association Center for Best Practices (2010). Common Core State Standards. *National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C*
- Nelson, J., Benner, G., Lane, K., & Smith, B. (2004) Academic Achievement of K-12 Students with Emotional and Behavioral Disorders. *Exceptional Children*, Fall 2004. pp. 59-73
- Patton, G. (2006) Promoting social inclusion in schools: A group-randomized trial of effects on student health risk behavior and well-being. *American Journal of Public Health*, 96(9) pp. 1582-1587

- Pintrich, P., De Groot, E. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*. Vol. 82, No. 1, pp. 33-40.
- Reschly, A. & Christenson, S. (2006) Prediction of dropout amount students with mild disabilities: A case for the inclusion of student engagement variables. *Remedial and Special Education*, 27(5) pp. 276-292
- Rossi, R., Montgomery, A. (1994). Educational reforms and students at risk: A review of the current state of the art. *American Institutes for Research*.
- Somerville, M.P. (2017). "Metacognition." *Cambridge Assessment, International Education*.
- Sutherland, K., Lewis-Palmer, T., Stichter & J., Morgan, P. (2008). Examining the influence of teacher behavior and classroom context on the behavioral and academic outcomes of students with emotional and behavioral disorders. *The Journal of Special Education* 41(4) pp. 223-233
- Vaughn, S., Levy, S., Coleman, M. & Bos, C. (2002) Reading instruction for students with LD and EBD: A synthesis of observation studies. *The Journal of Special Education* 36(1) pp. 2-13.

Appendix

Appendix A: Student Self-Assessment Form

Name:

Date:

Assignment:

“Definition of Engagement: Participating in discussion and doing your best to complete the work assigned to you”

Self-Assessed Engagement Level

1 2 3 4 5 6 7 8 9 10

What work did you complete?

What are you still working on?