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Impact of Student Learning Communities on Student Achievement in the Classroom

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Abstract

The purpose of this study is to show a correlation between student learning communities and success on academic standards. When students understand the process of learning, identify their goal and work to achieve this goal, they are more likely to succeed. Collaboration allows all members to be active participants for their learning and solve problems together. This skill is critical in school as well as in all aspects of life. In this study, students were placed into student learning communities based on their multiplication fact fluency. Students in each group determined their intervention, learned how to interpret data, participated in student led collaboration meetings, and analyzed academic growth individually and as a group. Students showed an increase in 21% proficiency on their five minute, timed multiplication tests from quarter 2 to quarter 3. Based on these results, it is evident that student learning communities assisted in student achievement.

Impact of Student Learning Communities on Student Achievement in the Classroom

When students and adults collaborate and share ideas, everyone involved in the process benefits. Collaborative learning teaches students how to be resilient and utilize their peers as resources (Edutopia, 2012). By sharing ideas and taking ownership and responsibility for learning, students gain a deeper and more meaningful understanding of the content material. In order for collaboration to work, teachers need to set a strong foundation where students know the expectations for collaborative learning and what it should look like and sounds like in the classroom. By using effective classroom management, teachers can instill in their students the value of working through the process of learning and not just the end result (Edutopia, 2012).

Professional Learning Communities (PLC's) is one effective way that teachers communicate to share ideas in order to boost student achievement. By implementing a collaborative learning environment through the use of Student Learning Communities (SLC's), student achievement will increase as students take ownership of learning and work. The fourth grade math students in Mrs. Nelson's class were introduced to SLC's in February of 2017. Students were taught what an SLC would look like in the classroom and then implemented the process through daily collaboration, weekly assessments and weekly SLC scheduled meeting times with the teacher. Students were taught to analyze data and collaborate to find strategies to increase multiplication basic fact scores among the group of learners.

Literature Review

As stated on Edutopia (2002), collaborative learning allows students the opportunity to utilize their peers as resources. When students are placed in groups of mixed ability, they learn how to work together and understand the needs of the members of the group (Edutopia, 2002).

Mixed ability grouping allows higher achieving students to develop skills of patience and further hone in on their understanding of the material as they explain it to peers. For the on level and below level students, they are able to have material explained to them in a different manner. Since all students are expected to contribute and be active members of the learning community, there is accountability for all students involved (Edutopia, 2002).

Hanover Research (2014) supports the idea that math interventions that are implemented early on are imperative to students being successful in mathematics. Interventions that provide students with time to practice rote mathematical facts such as multiplication will allow the student to become more successful and confident in content area that is more challenging as the students move through the grades. By providing intervention and following it up with data analysis and discussion, learning communities are able to tailor the instruction to meet their needs (Hanover Research, 2014).

Dialogue and active listening are key components of a collaborative learning environment. Roughly 70% of the school day is spent in discussions (Jabari, 2014). When educators take the time to explicitly teach students how to actively engage in discussion, the academic outcomes are greater. According to Jabari (2014), "Classroom talk is not only a means of students supporting each other, but also of holding each other accountable by helping clarify, restate and challenge ideas." Classroom talk is necessary for student learning communities. Students need to understand the importance of discussing data, sharing learning strategies, and working together. When students feel safe, they are more willing to look at the data honestly to determine their individual and group needs for success.

The need for data to drive learning communities' stems from the Professional Learning Community approach, as stated by Du Four et al. (2004). Using data effectively allows for groups to remain focused and diligent to the task at hand. This carries over into the student learning communities, which is based off the DuFour model. Provini (2012) supports the importance of data. Reviewing data lets the group determine what interventions are successful and what modifications need to be made to move the group along (Provini, 2012). Provini (2012) not only supports the critical need for one's understanding of data but also emphasizes the need for collaboration as well. Provini (2012) believes that a shared idea that all students can learn and should be held to high expectations. This belief needs to be shared so that all members of the student learning community understand what is expected of them as a group as well as an individual learner. Students need to be cognizant of the fact that not only do they need to make an effort to learn but they also need to provide support for peers.

Not only do students need to have a clear understanding of the expectations, accountability, how to collaborate, and how to interpret data, they must also be able to reflect on the learning process. Reflection should be embedded into the process so that students are thinking about what they are doing and how they are making progress (Schmidt, 2011). This allows students to think about what they knew going into the student learning community and how they showed growth throughout the process. The primary goal of self-reflection is for students to not only learn from what they are doing but also retain that information and apply it in other areas (Schmidt, 2011). A student will not intuitively know how to reflect; rather it is a skill that needs to be taught (Schmidt, 2011). The student learning communities used their understanding of data and their observation and participation in intervention time in order to orally self-reflect on the learning process.

As stated before, self-reflection needs to be embedded in the learning community. This allows students to re-evaluate how the group is functioning and what can be done better (Stocker, 2015). According to Stocker, students were often able to determine when their group was not functioning but were unsure on how to seek outside help for support. Through a formalized student learning community, the group norms are established prior to the group meeting and revisited throughout the meetings when needed (DuFour, et.- al.. 2004). This allowed students to understand that each individual had a voice that should be heard and it was okay to speak up and ask for help. By doing so, students determined when an intervention was not proving to be successful in helping them retain basic multiplication facts.

Data Collection

There are two sections of fourth grade math that Mrs. Nelson teaches. Each section meets for two hours and fifteen minutes and covers the same standards. The morning class has 22 students with 14 females and 8 males. This is a diverse class with 8 students identifying as African American, 2 students identifying as Hispanic and 2 students identifying as Asian American. One student was previously on an IEP for mathematics in kindergarten and first grade. This student is in the beginning phases of being tested again to be placed on an IEP again as there is minimal math growth. Two students are on behavioral plans and two students are in the talented and gifted program for mathematic extension work. Prior to implementing student learning communities, the morning class was at 61% proficient on their five minute timed multiplication test administered at the end of each quarter.

The afternoon class contains 23 students; 7 females and 16 males. There is one student on an IEP, two students in the ELL program and one student in the talented and gifted program. Seven students are identified as African American; three Hispanic and one Pacific

Islander. At the end of the second quarter, the afternoon class was at 43% proficient on their five minute timed multiplication assessment.

Student learning communities were implemented in order to determine if students took control of their learning, would their test scores increase? The teacher decided to administer a weekly three minute timed test of basic multiplication facts each Monday. The goal of giving students three minutes as opposed to the five minutes they would have at the end of the quarter was simple. Less time meant that students needed to be more fluent in order to complete the assessment in the amount of time. To be proficient on a three minute timed test, students would need to score 60 out of 100. The five minute timed test given quarterly requires students to be at a score of 95 out of 100 to be proficient at the end of the third quarter.

Prior to the five week study, test scores from the second quarter were looked at and analyzed to determine mixed ability groups. Students then took a three minute timed multiplication test as a pre-assessment. This was administered to determine how students handled the three minute test and if there was a vast difference in their personal scores when taking a three minute test versus a five minute timed test. Mixed ability groups were looked at to ensure that groups were equal in that there were some students' proficient, students approaching benchmark and those who were significantly behind.

At the beginning of student learning communities (SLC's), students viewed a teacher led PowerPoint which shared what an SLC was and what the student expectations were. They were shown the schedule which consisted of: weekly assessment on Monday, three days of intervention for 15 minutes, and one day of "teacher time" where they were scheduled to meet with the teacher and learn how to interpret data and analyze scores. Students were placed in their SLC groups and told to look at their scores and talk about how they each felt they learned

best. Together as a group, students determined what their intervention would be as a group to increase fact fluency. Groups discussed what their norms were and what they expected group time to look like. There was an emphasis on student ownership and empowerment of learning as the basis of the study.

On Monday of week one, students took their weekly timed test. That evening, tests were scored. The remainder of the week, students spent one day in teacher time and three days in their intervention. During teacher time, students looked at their weekly score. Students celebrated which students were at benchmark or close to benchmark and discussed what they would do as a group to move the members not proficient towards the goal of 60 facts correct in three minutes. Students determined which group members were proficient and how they would move everyone in the group along to proficient by the end of the study. The teacher's role was a facilitator and encouraged students to actively be involved in the planning and implementation of their intervention.

Interventions varied depending on the group. Some groups chose multiplication flashcards, others chose timed tests on paper, some chose timed tests on thatquiz.org. One group chose Moby Max to increase their fact fluency. Another group opted to play a Multiples partner game that was available in their math center basket. Groups worked together and often chose a combination of two different intervention activities. For example, one group chose flashcards two days and a coloring sheet from coloringsquared.com to increase their fact fluency. Teacher time allowed students to analyze scores and determine if their intervention was successful or not. Through discussions, students recognized what was helping them show growth as individuals as well as within the group.

This continued for four more weeks. Each Monday was the same three minute timed test followed by one collaborative teacher-student meeting time and three days of intervention for fifteen minutes. As the weeks progressed, students shared what was helping them grow individually and how they could assist teammates. They analyzed their scores and made changes to their interventions (See tables below). Groups determined that if scores were not growing, then they needed to change up their intervention. One group started with flashcards and felt that they were unable to accurately see how they were growing and determine if their intervention was effective. They changed their plan and did flashcards just one day and thatquiz.org timed tests the other two days. Many students who were proficient would ask the non-proficient students what they preferred to do, as those were the scores in need of growth.

Table 1: Morning class data collection

Student	2/6/1 Pre Assessment	2/13/17	2/21/17	2/27/17	3/6/17	3/13/17
A2	100	99	100	100	100	100
B2	100	99	100	100	100	100
C2	43	48	51	47	55	63
D2	37	46	36	60	43	35
E2	62	65	75	90	91	93
F2	66	92	97	98	99	99
G2	60	63	69	70	80	87
H2	16	56	41	57	39	56

I2	33	40	53	65	71	70
J2	61	65	74	67	81	95
K2	x	98	100	100	100	100
L2	51	63	67	45	42	68
M2	68	65	68	77	100	98
N2	x	x	84	90	83	76
O2	100	99	100	100	100	100
P2	69	72	67	69	65	72
Q2	x	92	83	81	100	100
R2	99	97	100	100	100	100
S2	100	100	100	100	100	100
T2	100	99	100	100	100	100
U2	60	69	69	71	72	90
W2	not in class	42	48	49	45	69
% Proficient	68%	76%	77%	82%	77%	91%

Table 2: Afternoon class data collection

Student	2/6/17 Pre Assessment	2/13/17	2/21/17	2/27/17	3/6/17	3/13/17
A1	100	94	95	100	92	80
B1	100	99	100	100	100	100
C1	58	95	92	98	98	96
D1	30	40	44	36	43	44
E1	27	15	39	60	57	61
F1	45	51	54	49	67	70
G1	83	94	86	94	83	100
H1	45	x	65	70	52	72
I1	99	100	100	100	100	100
J1	77	92	89	x	100	100
K1	53	61	60	60	60	62
L1	100	100	100	100	100	100
M1	97	100	100	100	100	96
N1	54	50	62	64	67	70
O1	100	64	100	100	100	99
P1	100	73	100	100	100	100

Q1	100	100	100	100	100	100
R1	49	54	62	68	66	67
S1	38	45	50	66	60	69
T1	100	100	100	100	100	100
U1	30	66	24	40	60	61
V1	64	78	99	81	95	98
W1	59	73	69	70	70	74
% Proficient	55%	76%	82%	86%	86%	95%

Data Analysis

At the end of the five weeks, students were administered their end of quarter three five minute timed test on March 13. Students in the morning class grew from 68% proficient to 91% proficient. The afternoon class saw an increase from 55% to 95% proficient. The purpose of this study was to determine if student learning communities as a form of intervention would increase the quarterly timed five minute tests. At the end of quarter 2, the morning class was at 61% proficient. After the student learning communities were used as an intervention consistently for five weeks, student scores rose to 82% proficient. Prior to the study, the afternoon class was at 43% proficient on the quarterly timed test. This class saw their quarter three scores increase to 65% proficient.

Analyzing data from the morning class proved to be pretty straightforward. Student D2 had the most influx in scores, with the peak week being in the 2/21 score. D2 began at a score of 43 basic facts correct in three minutes and ended at 35 correct in three minutes. D2 was

previously on an IEP with math goals until two years ago. At that time it was determined that D2 was making enough growth and was taken off the IEP. However in that time since being removed, the curriculums in the district changed in order to better align with the Iowa Common Core. D2 began to see a decline in growth and understanding of mathematical concepts over the 2015-2016 and 2016-2017 school years. During the time of SLC implementation, the classroom teacher was also implementing intensive Tier 3 one-on-one intervention and gathering data for the Student Concerns Team in order to determine if further testing was necessary to assist this student in getting the help needed in mathematics. Data collected in the SLC study and from the Tier 3 intervention determined that further testing was necessary and will begin within three weeks after the end of the SLC study.

Student H2 is on a behavior card and had a difficult time not only working in a group but being able to listen to feedback in order to increase awareness and understanding of mathematical concepts. The SLC that H2 was in saw the remainder of the group a proficient by the end of the study, other than H2. This SLC group focused in their teacher time on ways to assist H2. They provided suggestions and attempted to implement them each week during SLC intervention time. The group offered to give up recess and work through lunch in order to help H2 be successful; however H2 refused to do any of this. H2 did show an increase from a score of 16 multiplication facts correct at the beginning of the study to 56 at the end of the five weeks of SLC intervention. While the student showed considerable growth over the five weeks, a score of 56 did not meet the proficient score of 60 correct on a three minute test.

There were many success stories in the morning class when looking at SLC scores. For instance, J2 had an increase in 34 facts correct on the three minute timed test. When looking at the quarter two assessment, J2 was at a beginning score of 79/100 on the five minute test. After

intervention, J2 scored a 95/100 on the quarter three timed assessment, earning a "Meets" on the third quarter report card.

Student G2 scored a 51/100 on the quarter two assessment. After intervention, G2 scored a 100/100 on the third quarter assessment. When discussing scores with G2, this student stated an increase in confidence in multiplication abilities, an awareness in how to read and interpret data, how to effectively communicate with others and rely on others for support, and an overall better understanding of additional math standards where a strong foundation in multiplication facts is necessary.

Student U2 had been proficient each quarter on basic multiplication facts as well as the weekly SLC assessments. U2 was asked to articulate what was learned from SLCs. U2 recognized proficiency in basic multiplication facts throughout the process and stated that confidence grew as U2 was able to see scores increase in small increments weekly. This student also stated that having ownership in learning and determining what to do for intervention was empowering. U2 stated a better understanding of what each individual needs to do in order to continue to be successful on mathematic standards.

Comparing the quarter two to quarter three scores, the afternoon class saw an increase in 22% proficiency. However, this class was still far below the district expectation of 80% proficient on each mathematical standard on the report card. The afternoon class had five students still in the "beginning" category on the quarter 3 report card. Of those five students, one student was ELL, one student had behavioral issues that interfered with learning and two students had gaps in learning based on being pulled out of core math instruction during the 2015-2016 school year for additional reading support. However, student E1 still showed ample growth on the quarterly assessments, moving the score from 27% correct at the end of quarter two to

86% correct at the end of SLCs and quarter three. Student E1 stated that SLCs forced a sense of ownership over growth and scores. This accountability carried over in daily work and E1 began to turn in homework on a more regular basis, which the student attributed to work within the SLC. Data collected from SLCs is also providing the teachers and Student Concerns team in the building with data to determine how to better assist D1 in mathematics.

U1, an ELL student, recognized that SLCs provided opportunities to increase basic understanding of multiplication facts. Prior to SLCs, U1 was at 36% on the quarter two assessment and at a "Beginning" on the report card. U1 participated in SLCs and also benefitted from additional small group Tier 3 support with an ELL Para who utilized partners from the SLC group to work with them. U1's quarter three score on the five minute, timed multiplication assessment was a 92% ("progressing" on the report card). U1 felt an increase in confidence in basic multiplication facts. U1 began to more actively engage in centers during the core math instruction and also felt more confident participating in small group instruction within the math classroom.

Student R1 began SLCs at 53% on the quarterly basic facts multiplication assessment. Each week, R1 saw steady growth in the SLC assessments. When the SLC was finished, R1 was at a score of 92% on the third quarter assessment. R1 was instrumental in the implementation and accountability in their SLC. R1 created a game with a reward system that the group used several times a week in their intervention. R1 worked on this at home and brought it in for the group to use. R1 stated that helping others learn was the best part of the SLC and that adding creativity in the creation of a game allowed a different perspective on how to use math in daily life.

Conclusion and Further Study

Since the SLCs, students have overall felt an increase in accountability for their school work and a sense of responsibility for helping others learn. The ownership of learning has provided students with greater confidence in developing skill sets needed for more difficult mathematical concepts. Students have been eager to have other adults visit the classroom to explain what an SLC is, how it works and how it has been beneficial to their learning.

Both classes have asked to continue with SLCs in quarter four. The classroom teacher has decided to take the data collected from the SLCs and the quarterly assessments to determine which students would benefit from further basic multiplication fact intervention. The students scoring proficient will be placed in groups to focus on other mathematical concepts including subtracting across zeros, fractions, and division. The afternoon class is not at the district expectation of 80% on basic multiplication facts therefore their class will have more students focusing on multiplication. Students in the afternoon class will continue to utilize by SLCs but now there will be an additional tier group created to provide more intensive fact practice to these students.

The classroom teacher has taken this opportunity to show others data from the study and discuss how other educators would see benefit in adding student learning communities to their own classrooms. Teachers in the district participate in Collaborative Teacher Time weekly, which is a form of Professional Learning Communities. For the 2017-2018 school year, the district's goal is to further align CTT's with PLC's. If PLC's will be used to assist in student achievement, the implementation of SLCs would also benefit student achievement, as proven by this study with forty five students. Moving forward, the classroom teacher has been named a lead teacher for the building next year. This new position will provide a platform for SLCs to begin to

spread throughout the building as a form of intervention. The classroom teacher has met with the building's math coach to discuss how SLCs can support the traditional intervention time in the building.

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