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Feedback and the Effects on Progress Monitoring

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Abstract

The purpose of this action research paper was to explore the effects of timing of feedback on progress monitoring scores for students in special education. Ten students, grade nine through eleven, completed AIMSweb math application progress monitoring twice per month and received feedback on their results. The control group was provided with delayed feedback during the week in between testing periods while the treatment group received immediate feedback after completing the probe. Feedback consisted of the total number of points earned, what questions were answered correctly, and the researcher working through missed problems with the student. All students were provided with the same feedback. Data was collected over the course of four testing periods in seven weeks. The findings in this study indicated no significant difference between immediate or delayed feedback on student performance.

Feedback and the Effects on Progress Monitoring

Feedback is everywhere. A grade on a paper, a reaction from an audience, a coach correcting form, a cell phone usage summary, or a sit-down conversation with a boss on job performance are all examples of feedback. As seen with these examples, feedback can be given and received in various forms. The *Oxford English Dictionary Online* (2020) describes feedback as "the modification, adjustment, or control of a process or system by a result or effect of the process." Feedback can also be defined as a response presented to an individual on a part of his or her performance (Wiliam, 2013). The individual receives the feedback either during or after the performance and uses the information presented to him or her to change and improve in the future (Jug, Jiang, & Bean, 2019).

Feedback plays a major role in education. The purpose of feedback is to get students to progress from one point to the next and perform at a higher level with the assistance of another individual to evaluate his or her performance (Molloy & Boud, 2013). It can be difficult to evaluate oneself, which is why it is necessary to receive feedback from an outside source. By being provided with feedback, the hope is to produce change in the individual that will promote reaching full potential. Feedback should be based on the individual learner to benefit him or her in the future (Jug, Jiang, & Bean, 2019). Feedback needs to be used effectively to change teaching and activities in order to meet the needs of all learners (McFadzien, 2015). Students do not all learn in the same way, which is why it is important to provide feedback based on each individual student's specific needs.

Within education, feedback is important for both teachers and students. According to Molloy and Boud (2013), feedback is a tool that can benefit both the teacher and learner. McFadzien (2015) found that feedback is essential for learning to occur, but is also vital for

teachers in providing the instruction to students. Teachers can receive information on student engagement in a lesson or what strategies are most useful. Students can be provided with feedback on ways to improve a paper or how to behave more appropriately in class. Feedback is the center of all learning (Jug, Jiang, & Bean, 2019). Without being provided information after a performance, a person does not always know what to fix or improve upon in upcoming performances. The feedback he or she receives provides the framework for ways to change in the future.

Feedback on progress monitoring is essential for students in special education. Progress monitoring is a collection of data for each student on an Individualized Education Plan, or IEP. It is a way to assist the special education teachers in deciding on instructional changes for students based on progress toward their goal ("Progress Monitoring Procedures"). In Iowa, progress monitoring needs to be conducted and graphed twice per month, or every other week. Providing students feedback on their performance on progress monitoring is important to help them learn and grow in order to achieve their goal.

Feedback is a necessary tool to learn and grow, which is the main reason why there have been many studies conducted on feedback. More specifically, effective feedback is a focus. According to Omer & Abdularhim (2017), poor, inadequate feedback can play a negative role in a student's learning process. Effective feedback should be provided in a comfortable environment, include goals created by the teacher and student together, require self-reflection, and can help students improve (Jug, Jiang, & Bean, 2019). Timing is also a key factor in providing effective feedback to students. However, the timing of feedback is a debatable subject. What is considered the best time to provide feedback to a student, and what are the effects to learning?

The purpose of this action research is to determine the appropriate time to provide feedback to students in special education on his or her progress monitoring to help improve scores and learning. The research questions driving this study are the following: When is the best time to provide students feedback on his or her progress monitoring scores to enforce information retention and improve testing scores? Is it more beneficial for the teacher to provide feedback to students directly after completing progress monitoring or the week in between testing periods? The researcher's hypothesis is that immediate feedback will be the most beneficial for student learning and retention, as the information will be fresh in the student's mind.

Review of Literature

Feedback is necessary in the learning process, a point that will be explored in this literature review. In order to learn new skills, feedback, whether self regulated or from an outside source, is critical (Chan, Konrad, Gonzalez, Peters, & Ressa, 2014). This feedback could be provided in a sport, a life lesson, or school and delivered from a teacher, coach, friend, or technology source (Masantiah, Pasiphol, & Tangdhanakanond, 2018). The purpose of feedback is to provide a person information to help improve his or her performance in the future. Molloy and Boud (2013) describe feedback as a mirror that reflects the performance to the learner. Optimal feedback provides knowledge of the current level of an individual along with how he or she will apply the knowledge to future learning experiences (Wiliam, 2016). Along with being provided feedback, it is important for people, especially students, to have opportunities to use the feedback they have received (Wiggins, 2012). By receiving feedback and having chances to use it, people are able to make the most improvement in their performance and use feedback successfully.

Feedback in the School Setting

More specifically, feedback is crucial in the classroom environment. In McFadzien's (2015) research, she concluded that effective feedback is essential in teaching and learning, as it creates a deeper understanding of material and concepts. Feedback allows students to reflect on what they have done correctly and what mistakes were made in the process. This information provided to students leads to and ensures their learning (Al-Bashir, Kabir, & Rahman, 2016). Wiliam (2016) states feedback needs to focus on guiding and developing an individual rather than focusing on the outcome, like a grade on a test. In an interview conducted by Plank, Dixon, and Ward (2014), students acknowledged the value of feedback within education. By positively impacting a student, additional benefits will result from his or her performance.

Chiu and Alexander (2014) explore the effects of feedback versus no feedback in young students when given multiple-choice questions. The authors found that feedback influences a student's performance greatly. When students are not provided with feedback, they do not respond as consistently in showing their understanding and learning. In comparison, when provided with feedback, students were able to perform at a higher level more consistently. This study shows the importance of feedback to benefit and improve student learning. When feedback is provided, students are able to learn more and create a deeper understanding of the concepts presented.

For teachers, feedback is also a useful tool in planning and accommodating instruction for all learners in a classroom. Instruction needs to center around feedback. Teachers need to ensure feedback is being provided to students along with provide opportunities in their instruction for students to use the feedback they have been given (Chan, Konrad, Gonzalez, Peters, & Ressa, 2014). If there is not an opportunity for students to apply the learning from the

feedback received, there is no use for the feedback. It is imperative that students and teachers work together to achieve the common goal of learning through feedback (Jug, Jiang, & Bean, 2019). McFadzien (2015) found that teaching and learning can be transformed by feedback in meeting the various needs of each individual within a classroom.

Feedback is useful for students, but is also advantageous for teachers in promoting a higher learning experience for their students (Al-Bashir, Kabir, & Rahman, 2016). Based on student assessment, teachers are able to gather feedback on how effective their instruction has been (Chan, Konrad, Gonzalez, Peters, & Ressa, 2014). When an assignment or assessment has been graded, the teacher is able to reflect on his or her instruction. Were there failing grades? What part are students demonstrating a lack of understanding? These questions guide a teacher, through feedback, in knowing what part of his or her instruction needs to be adjusted to better meet the various needs within the classroom. Molloy and Boud (2013) found that teachers are able to enhance their teaching skills by receiving this feedback. Feedback also helps instructors in knowing what is being misunderstood in class along with what each specific student is struggling with (Pearson Education, 2016).

Students with a Learning Disability

There are many different types of learners within a classroom including some above grade level, some at grade level, and others below grade level. Feedback to all levels of learners is important. Chan, Konrad, Gonzalez, Peters, & Ressa (2014) state, “Feedback is even more critical for students with disabilities and those who are struggling to meet academic demands” (p. 97). Struggling learners need to be provided with feedback in many areas to help the learning process occur.

One area that students with a learning disability need feedback in is their progress monitoring. Progress monitoring is a collection of formative data to monitor the progress a student is making to meet a specific goal. In Iowa, progress monitoring takes place at least twice per month in each goal area a student has on his or her Individualized Education Plan or IEP. The data collected for progress monitoring assists the special education teacher and the rest of the IEP team in deciding if any instructional changes need to be made to ensure student learning and progress ("Progress Monitoring Procedures"). Like any other assignment or assessment, it is important for students to receive feedback on their progress monitoring scores each testing period. A student with a learning disability may respond, accept, or use the feedback they have received differently (Chan, Konrad, Gonzalez, Peters, & Ressa, 2014). As a teacher, it is important to remember students may respond in different ways and to adjust the feedback as necessary to benefit the learner to the maximum extent.

Effective Feedback

There is no debate that research supports the influence and usefulness of feedback in a student's learning and engagement in school. The primary focus is that feedback needs to be effective. In order to be effective, feedback needs to be consistent, specific, and concrete (Wiggins, 2012). Simply telling someone "good work" does not improve performance so therefore is not specific feedback that is beneficial to his or her future learning. Studies suggest that praise should be avoided (Jug, Jiang, & Bean, 2019). Another way to provide effective feedback is to refrain from connecting it to comparative means (Pearson Education, 2016). When feedback is provided only to help a student get a certain grade on an assignment or test, it undermines the importance of the actual learning.

It is imperative that feedback is effective for students, which entails careful planning and understanding in order to establish within a classroom. According to Omer and Abdularhim (2017), effective feedback is easily understood, is collaborative, offers ways to make corrections to improve, and has clear goals. If goals are vague, students may not be motivated to respond to feedback in ways to achieve the objective (Wiggins, 2012). Jug, Jiang, and Bean (2019) add that in order for feedback to be constructive, students need to be accepting of and engaged in the conversation for the full duration that information is presented to them.

Specific feedback to a student on his or her performance cannot just occur, but rather requires a safe environment and a personal relationship to be built. According to Chan, Konrad, Gonzalez, Peters, & Ressa (2014), teachers need to create a "risk free, student focused, and feedback focused" (p. 99) classroom, where there is trust between the student and teacher for the best results with feedback. Jug, Jiang, and Bean (2019) also state that the establishment of a relationship between the teacher and student in a safe environment is of utmost importance in feedback being effective. According to Wiliam (2016), it is important for the teacher to be familiar with the type of learner a student is when providing feedback. The teacher should know what the student typically struggles with academically, how the student responds to certain situations, if it is a good or bad day for the student, or the vocabulary to use that can be understood by the student. By being aware of these as a teacher, a student recognizes the teacher cares and has the best interest for his or her learning (Wiliam). In return, the student is more likely to listen to the feedback and apply it to future learning experiences (McFadzien, 2015). For the most effective feedback to occur, there needs to be an environment where the student feels safe and a mutual respect between teacher and student has been established.

Timing of Feedback

The timing of feedback is one discussion point that also contributes to feedback being effective. Since the information is present in the student's memory, feedback needs to be immediate (Omer & Abdularhim, 2017) (Chan, Konrad, Gonzalez, Peters, & Ressa, 2014). On the contrary, delayed feedback can allow reflection and evaluation on the learner's end (Molloy and Boud, 2013). The research that has been conducted on the subject of timing feedback occurs has generated mixed results based on the conditions of each experiment. When is the best time to provide students with feedback—immediately or delayed?

Feedback can occur at numerous stages in the learning process. It may come seconds, minutes, days, weeks, or months after a performance (Wiggins, 2012). For example, at a sporting event, a coach provides ongoing feedback within seconds or minutes of the performance from an athlete. In school, a homework assignment is handed in one day and typically returned the next day. A paper may be given back to the owner with feedback within one to two weeks. Standardized testing scores are delivered to the school and students several months after completion. Of these scenarios, what timing of feedback is the most beneficial for students to learn and grow from?

Fyfe & Rittle-Johnson (2017) conducted a study to discover the effects of timing of feedback. In this study, second and third grade students received direct instruction from their teacher and then were able to answer 12 questions on their own. The children were then split into three groups consisting of one group receiving no feedback, another group receiving feedback after each question, and the last group receiving feedback at the end of the 12 questions. The findings of this study reveal that immediate feedback and summative feedback yielded similar results. The different grade level of the students also played a role in the findings of this study, as

students in second grade showed more positive results from feedback than the students in third grade.

In another research study centered on timing of feedback, similar findings were discovered. Nakata (2015) created a study that provided feedback immediately, one week delayed, and four weeks delayed on a computer program. The premise of this study was to find if immediate feedback grants students to learn from their mistakes right away or whether delayed feedback allows time for students to process the information given. This study found there was no significant difference between the timing of feedback, but rather what each individual student prefers.

Immediate feedback. One viewpoint is that feedback needs to be delivered as soon as possible after a student has answered a question or delivered a performance. Chan, Konrad, Gonzalez, Peters, & Ressa (2014) state that feedback needs to be given as immediately as possible for optimal learning to occur. The sooner students can receive feedback on their performance, the better their future work will be (Wiggins, 2012). Wiggins continues on to share that it is imperative for teachers to find time to provide immediate feedback to students in an effort to keep the material relevant in their memory and have the chance to apply it within their learning. Making time for feedback is key.

A study conducted by Kehrer, Kelly, & Heffernan (2013) showed the importance of immediate feedback for students. In this research, one group of students received feedback on a homework assignment immediately when answering questions online. The second group completed their homework on paper and received feedback the following day. Students who received feedback immediately online learned 12 percent higher than their peers, supporting the

case of immediate feedback being more effective for student learning (Kehrer, Kelly, & Heffernan).

Duhon, House, Hastings, Poncy, and Solomon's (2015) research on feedback revealed immediate and individualized feedback resulted in substantial growth for students. The research took place in a second grade classroom where students completed subtraction problems for two minutes on a computer program. The control group in the study received no feedback and progressed to a new question each time. One experimental group received no feedback, but had a timer present on the screen. The other experimental group was provided with feedback displayed as a red or green checkmark on the screen after each problem answered. The control group remained steady throughout the study. However, both experimental groups demonstrated growth. The group provided with feedback showed the greatest increase in performance. The results suggest that immediate feedback is the most effective and plays an important role in improving student achievement.

In Zhang, Zhang, Luo, and Geng's (2016) research, immediate feedback and the connection to memory was the focus. The second study in this research compared older and younger adults' memory when provided with feedback. The age range for the older adults was 60 to 80 years old. The younger adults group was comprised of 19 to 25 year olds. Each group was given three word lists with objective feedback and post feedback administered throughout. The results of this study showed that both groups, younger and older adults, benefitted in memory strategies from immediate feedback.

Delayed feedback. The opposing viewpoint presents that when provided with feedback, there needs to be a time between the performance and when the feedback is provided. Mullaney, Carpenter, Grotenhuis, & Burianek (2014) administered a specific study to determine if delayed

feedback produced higher retention of material. When given wait time, or delayed feedback, the findings suggest that students' curiosity was sparked, which in turn increased student learning. The key was to keep delays short to continue to facilitate student learning. In conclusion, this study suggests it is necessary to find a balance between providing immediate feedback or giving wait time to students.

According to Metcalfe, Kornell, & Finn (2009), delayed feedback may enhance learning more than immediate feedback. In this study, sixth grade students participated in an online computer game where answering vocabulary questions correctly brought them to new levels to develop their character. The research was split into four sessions, where a learning phase, an initial test, feedback, and a posttest were administered. During the feedback stage, students were randomly split into three groups—no feedback, immediate feedback, and delayed feedback. In this study, delayed feedback was more beneficial to student learning as it occurred closer to the next testing phase. Metcalfe, Kornell, & Finn (2009) also conducted this research with college-aged students, where similar results were found. Delayed feedback produced the largest amount of growth for college students, but the difference between delayed and immediate feedback was not as significant as in middle school students.

As the research shows, there are varied outcomes on whether to provide students with immediate or delayed feedback to increase student achievement. Wiggins (2012) suggests that it may be more beneficial to use the word timely in regards to providing feedback. It is not always feasible for feedback to be immediate in certain circumstances. The timing of feedback is dependent on the classroom environment and the learner's willingness to accept the information (Molloy & Boud, 2013). If teachers can present students with feedback in a timely manner, learning will be positively impacted. Collins, Cook, Sweigart, and Evanovich (2018) agree that

despite the ever-changing methods and approaches present in education, it is essential that feedback is timely and objective for students.

The discussion present is to find the most sufficient time to provide feedback to students to enhance learning. Current research has proven that effective feedback is necessary for student progress and learning (McFadzien, 2015). However, research has generated mixed results in the area of timing of feedback showing advantages and disadvantages to both immediate and delayed feedback. Little research has been conducted on students with learning disabilities. Further research should occur on whether immediate or delayed feedback is most beneficial to student learning, especially for struggling learners.

Methods

Feedback plays a significant role in the learning process and is necessary to make adjustments in future opportunities and performances. Research proves the importance of feedback on student learning. However, when is the optimal time to provide students with feedback? Current studies suggest that immediate feedback is more beneficial to learning than delayed feedback, but there have also been mixed results on this topic.

The researcher sought to find when the best time was to provide feedback to students in special education that would benefit student achievement and scores on progress monitoring. The study was conducted within the researcher's own classroom. The guiding questions in this study connect timing of feedback and student achievement. When is the best time to provide feedback to students on progress monitoring scores to boost retention and improve future scores? Is it more beneficial to the student to receive feedback immediately after completing progress monitoring or the week in between testing periods? The independent variable in this research is

the timing of feedback while the dependent variable is the students' progress monitoring scores. Data was collected through student progress monitoring scores.

Participants

The action research was conducted in a small, rural school district in Northwest Iowa. The West Lyon school district is comprised of four towns including Larchwood, Inwood, Lester, and Alvord. The school is located in the country, and all grade levels reside in the same building. The school is composed of 912 students in kindergarten through twelfth grade. The demographics of West Lyon are 94% white, 4% Hispanic, 1% Multi-Racial, and less than 1% African American and Asian. According to the Iowa School Performance Profile (2019), 11% of the student population received special education services, 1% were English Language Learners, and 24% were of low socio-economic status. Within the district, many students live on a farm and are active in sports.

The high school in this study is made up of 267 students ("Iowa School Performance Profile," 2019). The district is a one-to-one school with each student having an iPad that can be taken home at night to complete homework. The day consists of eight classes beginning at 8:25 and ending at 3:25. Typical class sizes are around 25 students. Some specialized classes allow for around 10 students per class.

The ten participants within this research are in grades nine through eleven and range in age from 14 to 18 years old. The students involved in this study receive special education services in the goal area of mathematics. Two of these students receive special education services in math only, while the other eight students receive special education services in additional goal areas. Of the participants, six are female and four are male.

Measures

The quantitative data in this research study uses student progress monitoring scores for math using AIMSweb math application probes. The math application probes are timed for eight minutes, and the student may use a calculator as stated within his or her Individualized Education Plan. The progress monitoring assessments are completed every other week. As addressed within each student's IEP, the AIMSweb math application probe is at the grade level of the student. In this study, there are students who take the math application probe at the sixth, seventh, and eighth grade level. Six of the participants in this study took the sixth grade math application probe, three participants complete seventh grade math application probes, and one participant completes an eighth grade math application probe. Data was collected over a seven-week trial period. There were four testing periods.

Feedback was also provided to students throughout the research. All students received the same feedback. Feedback was administered as a total points score for the student along with what problems were correct and what problems were incorrect. The student was able to ask questions and could work through any problem he or she missed to gain a deeper understanding of how to solve in the future. One group received this feedback immediately after finishing his or her math application probe. The other group received this feedback the following week after completing his or her progress monitoring.

Procedures

This research that focuses on the timing of feedback on student progress monitoring scores took place during the third quarter of the 2019-2020 school year. The students involved in this study take a general education mathematics class, either Algebra I or Consumer Mathematics, and attend the special education setting during his or her study hall time for Specially Designed Instruction in the goal area(s) addressed within the IEP. Specially Designed

Instruction consists of re-teaching from the general education setting, math instruction at the level of the student, extra practice on math concepts, and progress monitoring completion.

In Iowa, students are required to complete progress monitoring every other week, or twice per month. This process occurs in the researcher's classroom consistently beginning at the start of the school year. In the area of math, students complete an AIMSweb math application probe that is timed for eight minutes. Students are able to use a calculator to complete as many problems as they can on the math application probe given at the grade level specified in an Individualized Education Plan. When graded, students receive points based on the AIMSweb Benchmark. Each student has a personal goal that is addressed within the IEP. The researcher provides students feedback on their progress monitoring scores the week in between testing periods.

This study consists of two groups. The control group, made up of five students, was provided with feedback on their AIMSweb Math Application probe score the week in between testing periods. The control group is listed as students F through J throughout the study. The treatment group, consisting of five students, received feedback on their progress monitoring scores immediately after completing the probe. The treatment group is listed as students A through E throughout the study. Students in the control and treatment groups were chosen based on the hour of his or her study hall.

Since students have been completing progress monitoring every other week for the entire school year, the testing period before the researcher began the study served as the baseline. Baseline data was collected on the week of January 15 when students completed his or her math application probes and received feedback the following week. The week of January 27 is when the experiment began. Students in the treatment group received feedback immediately after

finishing the math application probe throughout the week. The control group continued to receive feedback the following week, which was the week in between testing periods. This pattern continued on for seven weeks, or four testing periods, to collect data, which was documented on an Excel Spreadsheet.

Findings

Research proves the importance of feedback on student performance. However, there have not been significant findings on the best time to provide students with feedback. The qualitative data collected in this study aims to find the optimal time to provide feedback to maximize student learning. The research was conducted in the researcher's classroom with progress monitoring scores collected every other week.

The data collected was in the form of total points according to the AIMSweb Math Application answer key. Questions are worth one, two, or three points dependent on the difficulty level. The total points a student received was documented on an Excel spreadsheet to allow the researcher to compare and analyze the data to discern optimal time for feedback. The researcher hypothesized that immediate feedback would yield the best results for the students in her classroom.

Data Analysis

Table 1 shows the data that was collected over the course of a seven-week period on four testing dates. Students A through E were part of the treatment group that received feedback immediately. Students F through I were part of the control group that received feedback the week in between testing periods. From the control group, Student J's data was excluded due to a change in goal in the middle of the data collection period.

Table 1

Total Points on AIMSweb Math Application Probe

Student	Baseline: January 15	January 27	February 10	February 24	March 9
A	14	24	23	26	23
B	10	16	16	18	22
C	12	14	18	17	18
D	14	17	12	17	24
E	20	33	32	31	25
F	20	26	29	28	22
G	X	17	18	16	16
H	17	18	12	13	19
I	23	20	26	24	18

Note: X = data unavailable due to new goal being set.

Since there were two groups present in this study, an independent samples t-test was used to compare the data. The p-value Alpha = 0.05 is the standard probability value used in educational studies to determine significance of results. Any value less than 0.05 is an indicator of significant findings. Table 2 displays the group descriptives, which include the number, mean, median, standard deviation, and standard error for both groups in each testing period. Table 3 shows the findings from the independent samples t-test for this research.

Table 2

Group Descriptives–Student Data

	Group	N	Mean	Median	SD	SE
Baseline	Control	5	14.0	14.0	3.74	1.67
	Treatment	3	20.0	20.0	3.00	1.73
Testing Period 1	Control	5	20.8	17.0	7.79	3.48
	Treatment	4	20.3	19.0	4.03	2.02
Testing Period 2	Control	5	20.2	18.0	7.69	3.44
	Treatment	4	21.3	22.0	7.72	3.86
Testing Period 3	Control	5	21.8	18.0	6.38	2.85
	Treatment	4	20.3	20.0	6.95	3.47
Testing Period 4	Control	5	22.4	23.0	2.70	1.21
	Treatment	4	18.8	18.5	2.50	1.25

Note: The table displays the data collected through AIMSweb Math Application probes.

Table 3

Independent Samples T-Test on Student Data

	Statistic	df	p	Mean Difference	SE difference
Baseline	-2.339	6.00	0.058	-6.000	2.56
Testing Period 1	0.127	7.00	0.902	0.550	4.33
Testing Period 2	-0.203	7.00	0.845	-1.050	5.17
Testing Period 3	0.349	7.00	0.738	1.550	4.45
Testing Period 4	2.079	7.00	0.076	3.650	1.76

Note: The table displays the data collected through AIMSweb Math Application probes.

Discussion

Summary of Major Findings

The results of this study indicate no significant difference between immediate or delayed feedback on student scores and performance on progress monitoring. As seen in Table 1, all students, whether receiving immediate feedback or delayed feedback, displayed some growth throughout the research, but the growth was inconsistent in both the control and treatment groups. The largest amount of growth in both groups occurred within the first week of the research study's implementation.

An independent samples t-test showed no significant difference between the control group and the treatment group based on the feedback variable. In the baseline testing, the control group ($M = 14.0$, $SD = 3.74$, $n = 5$) versus the treatment group ($M = 20.0$, $SD = 3.00$, $n = 3$) yielded the result of $p = 0.058$. In order for data to be statistically significant, $p < 0.05$. Testing periods one, two and three produced probability values greater than 0.05. Testing period four showed the control group ($M = 22.4$, $SD = 2.70$, $n = 5$) and the treatment group ($M = 18.8$, $SD = 2.50$, $n = 4$) to have $p = 0.076$. Again, since p is greater than 0.05, this study indicates no significant statistical findings.

Limitations of the Study

Throughout the course of this research, some limitations that could have affected the data became noticeable. One limitation that was evident was the sample size. Since this study was conducted in a special education classroom, there were only ten students who were participants. Due to a new goal added during the data collection phase, one of the student's data was excluded from the study. Nine students is a small sample size. Framing conclusions off of a small sample size can possibly be misleading. Conducting this study with a larger group would allow for more

concrete evidence on the role of timing of feedback in the learning process. The time frame is also a limitation of the study. There were four testing periods that were part of the data collection over a seven-week period. This study could possibly generate different results if conducted over a longer time frame.

Natural growth throughout the course of the school year is also a possible limitation in this study. All students show some type of growth throughout the school year, whether small or large. In conducting progress monitoring every two weeks, the hope is that growth is happening for each student based on the Specially Designed Instruction provided according to the student's Individualized Education Plan. In this study, feedback was the variable manipulated. The growth that was observed during this research could be because of the feedback provided to students, but the growth could also be the natural growth the student would possess at this time in the school year.

Another limitation that became present in this study is the influence of outside factors on the student. Everyone has days where they are not performing their best due to outside influences. Students are no exception. Some internal and external factors that play a role in the outcome of progress monitoring scores are if the student does not feel well, is hungry, had a fight with a parent, sibling, or friend, or has anxiety. Completing progress monitoring on a day where a student is feeling one or multiple of these stressors does not result in the best scores or accurately reflect the learning that has occurred for that particular student. However, these factors are outside of the control of the student or researcher and therefore could not be prevented in this research.

An additional limitation throughout this study is the motivation level and preference of each individual student within the classroom. Students possess various motivation levels. Some

students in this study enjoy progress monitoring every two weeks, while others despise these testing periods. Students who dislike probes may demonstrate lower testing scores because they may not care or give their best effort. There were also some students in this study that were very involved and asking questions when provided with feedback from the researcher to fully understand their mistakes and improve in the next testing period. Others did not ask questions and viewed the feedback as another dreaded assignment to complete. Lastly, students have contrasting preferences. A couple students in the treatment group liked having feedback presented immediately, while others stated they preferred to have feedback in the week between testing periods like normal. On the contrary, students who were in the control group could have benefitted from immediate feedback.

Further Study

Further study into the timing of feedback, especially a focus on progress monitoring, would be beneficial for teachers. In future studies, as stated previously, a longer testing frame and larger student sample size would provide better insight into if immediate or delayed feedback is best in student learning and retention. A longer testing period and larger class size would grant more consistent, reliable data.

This study was conducted in the high school setting, but it could also be implemented at a different age level. Younger students may show quite different results than what this study revealed. It is possible that feedback plays a more significant role for younger students and their learning, but it may not. Middle school students could also display different outcomes based on the feedback provided. The study present focused on mathematics, but the study could also go into other goal areas, like reading, writing, or employability, for students. Students in special

education that are on a reading or writing goal receive feedback on their scores, but immediate or delayed feedback could play a role in future learning.

Additional studies in the future could target other areas of progress monitoring, like goal setting. In helping students in special education learn and grow, goal setting is something that could be researched further. Along with providing feedback, students could set a goal each testing period to create more purpose in completing the progress monitoring along with having something to work for and attain in the next testing period. Lastly, further studies could include a qualitative portion that takes student preferences into account. In this study, some students commented to the researcher that they preferred immediate feedback, while others favored delayed feedback. A survey for each student to complete would give the researcher feedback on what student preferences are.

Conclusion

The goal in education is to provide the best opportunities for students to learn and grow from. Feedback is a teaching strategy that greatly benefits learners. The purpose of this action research was to find when the optimal time is to provide students in special education with feedback on progress monitoring in the area of mathematics to help improve learning and retention. Over the course of seven weeks in the third quarter, data was collected on four testing periods. The quantitative data collected by the researcher was the total points a student scored on an AIMSweb math application probe. Feedback was provided to students either immediately after completing the progress monitoring or delayed by a week in between testing periods. All students received the same feedback on the total points earned along with going through questions they got correct and mistakes that were made.

The current study revealed that there was not a significant difference between providing feedback immediately or delayed on student scores and learning. All students in this study displayed growth at some point throughout the research, but the growth was inconsistent in both the control and treatment groups. The conclusion of this research is that there may not be a universal time to provide feedback to all students, but that feedback should be provided based on each individual and how they learn best ("Providing Educational Feedback," 2016).

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