

Northwestern College, Iowa

NWCommons

Master's Theses & Capstone Projects

Education

Summer 2023

Note Acquisition: A Comparison of Student Versus Teacher Monitored Progress

Laura Gibson

Follow this and additional works at: https://nwcommons.nwciowa.edu/education_masters



Part of the [Education Commons](#)

Note Acquisition: A Comparison of Student Versus Teacher Monitored Progress

Laura Gibson

Capstone Project: An Action Research Project

Northwestern College, Orange City, Iowa

Abstract

The action research plan documented in this paper was driven by the researcher's interest in the most effective strategies for optimizing student achievement of new notes on a band instrument. During four cycles, the researcher gathered student achievement of new notes when teacher monitoring and student monitoring. Fifth grade students playing the flute completed both types of monitoring and the results were recorded and compared using a dependent T-test and a bar graph. The researcher is in her fourth year of teaching and teaches fifth and sixth grade students primarily. Students learned a total of 99 new notes during the study. The results show that students in the study learned more notes when completing the teacher monitoring cycle. Students averaged 4.22 new notes when student monitoring and 6.77 new notes when teacher monitoring. This study opened the researchers' eyes to several types of effective progress monitoring tools and processes. The findings will encourage further exploration and use of progress monitoring tools in the band classroom.

Keywords: progress monitoring, self-monitoring, teacher monitoring, achievement

Table of Contents

Abstract.....	2
Introduction.....	4
Literature Review.....	7
Methods	
Participants.....	23
Measures & Procedures	24
Data Collection	26
Findings	
Data Analysis	27
Discussion	
Summary of Major Findings.....	32
Limitations of the Study.....	34
Further Study	35
Conclusion.....	36
References	38

Note Acquisition: A Comparison of Student Versus Teacher Monitored Progress

Introduction

Learning to play a woodwind, brass, or percussion instrument, which are all types of band instruments, involves learning many different skills. Breaking these skills down into categories allows the author to better understand the student learning process. When learning new notes, often student achievement is limited by the monitoring of new note acquisition. Additional challenges include the teacher's ability to introduce new notes given the size of the class and the variety of instruments represented. If the process was student guided and self-monitored, there may be improved new note achievement. Under the umbrella of progress monitoring falls self-graphing and self-monitoring. Significant research supports the effectiveness of self-monitoring with all types of learners across grade levels (Rafferty, 2010). Self-graphing is effective and motivational as an intervention (Hirsch et al., 2013; Rafferty, 2010). There is, however, a lack of published work about students learning to play new notes on a musical instrument and any correlation with student progress monitoring.

The purpose of this action research project is to examine the effectiveness of student self-monitoring when acquiring the knowledge and understanding to play new notes. There are many ways to go about collecting data to examine effectiveness and understanding, and this can be further complicated by the different types of instruments being taught and played. Therefore, this action research plan will only assess the research question as it pertains to the fifth grade flute section at Humboldt Middle School in Humboldt, Iowa. The data, which will be comprised of two types of progress monitoring, will be gathered during band lessons. Progress monitoring will be completed by the teacher and self-monitoring will be done by the student. A baseline for effectiveness will be determined by the researcher and the results will then be graphed and

compared.

The goal of this action research is to answer the following question:

Are students able to demonstrate a higher rate of new note acquisition (including the ability to play/explain/recognize new pitches) when monitoring their own performance as compared to when their performance is monitored by the teacher?

The action research in this study will examine new note acquisition of fifth grade band students playing the flute. This is an ideal place to begin research on the topic, as students are just beginning band, have very little background knowledge, and otherwise may be considered a clean slate. Given the lack of research on the combination of these two topics, the author will examine in the literature the effectiveness of self-monitoring, in addition to progress monitoring, and self-graphing. Students will be tasked with learning new notes and monitoring will occur in two formats. The student will self-monitor his or her progress using self-graphing and in the opposite group, the teacher will monitor the student's progress. The study will examine and compare the effectiveness of both types of progress monitoring when a student is learning to play, recognize, and explain new notes on his or her instrument.

The articles selected and included in the literature review examine the effects of progress monitoring, self-monitoring, and self-graphing. The goal was to include publications from the past ten years, however, this proved difficult. The author concluded that much research exists on the above-listed topics, however, general research has provided a foundation for much more specific research questions in the past ten years, therefore, it was necessary to look beyond the past ten years. The following topics are being considered as they impact the learning of new notes: this act of demonstrating knowledge of a new note involves controlling the air, positioning the hands and fingers, and identifying and learning to recognize the position of the notes on the

music staff. Band involves six to ten different instruments, all requiring different skills to play. These instruments are all being taught and played simultaneously. It is ideal to teach students to self-monitor their achievement when playing an instrument for various reasons. Pacing is better maintained when students are actively engaged in their own learning.

Self-monitoring, a specific tool to progress monitor, when taught, is an effective strategy to help students make measurable improvements in achievement (Falkenberg & Barbetta, 2013; McDougall et al., 2012; Moore et al., 2001; Kim et al., 2018; Amato-Zech et al., 2006; Harris et al., 2005). McDougall et al.'s (2012) study examines the use of tactile cues to complete self-monitoring and documents increased student performance. Meanwhile, Amato-Zech et al. (2006) implemented self-monitoring strategies tactilely cued to address off-task behaviors. Another type of self-monitoring includes the use of student graphing of progress. The article by Hirsch et al. (2013) explores the use of self-graphing as a social, academic, and behavioral intervention. When students are placed in large classes (a fifth grade class averages 75-90 students at the middle school in band) it is essential to teach skills that aid students in the learning process (Smilkstein, 1993). Self-monitoring will free up the teacher to attend to the content (Vanderbilt, 2005, p. 21). According to various studies and articles that will be included in the literature review, student achievement should be higher when they are self-monitoring as opposed to when teachers are monitoring.

The sources for the action research plan and literature review were compiled from the Dewitt Library at Northwestern College in Orange City, Iowa. To be considered for inclusion, the articles and studies needed to present information about self-monitoring or progress monitoring. The goal to include sources published in the last year 10 years was initiated, but it was discovered that significant recent research has specialized in different areas of self-

monitoring or progress monitoring, and it was necessary to reach further back into the research-data base to acquire applicable sources. Twenty sources were selected based on their relevance to the action research plan presented in this paper. The studies were used to better understand progress monitoring, gather ideas for implementing an action research plan utilizing self-monitoring, and identify potential strengths and weaknesses in progress monitoring.

Literature Review

Progress Monitoring of Student Achievement

Progress monitoring generates data concerning student achievement which allows teachers to gauge the effectiveness of teaching strategies and provides data representing student growth. Countless studies show the effectiveness of progress monitoring across multiple grade levels and with all types of learners. The following sections will examine studies and their correlation to the progress monitoring of student achievement. First, strategies and routines to increase student achievement. Second, the teacher's perception of progress monitoring and the resulting effects on student achievement. Third, progress monitoring of students receiving special education services and the importance of systematic methods for fidelity and the processes within progress monitoring. Fourth, the impact of progress monitoring schedules on student achievement. Concluding this section, the research will address the potential effects in the band classroom.

Strategies and Routines to Increase Student Achievement

All types of learners can benefit from progress monitoring with the use of strategies and routines. According to Furey & Loftus-Rattan (2022), students with learning disabilities benefit from performance feedback and goal setting (PFGS). The researchers set out to improve student outcomes in addition to engaging student motivation and self-efficacy. “Academic progress

monitoring is essential when implementing Individualized Education Programs for students with learning disabilities and more generally in a multi-tiered system of supports framework” (Furey & Loftus-Rattan, 2022, p. 329). The six-step progress monitoring PFGS includes: “explicit performance feedback; specific, true, and positive feedback; collaborative data graphing; collaborative data analysis; reflective questioning; and collaborative goal setting” (Furey & Loftus-Rattan, 2022, p. 330).

According to the authors, the strategies and routines listed above are intended for weekly or biweekly use with elementary and middle school aged students receiving academic interventions based on his or her IEP or through the MTSS framework. They are intended for one-on-one implementation by the same teacher. The results examined by the authors include academic, self-efficacy, and academic motivation. The authors present the need for “teachers to systematically and intentionally implement practices that improve academic skills and encourage motivation and self-efficacy in students with learning disabilities” (p. 335).

Teacher Perception of Progress Monitoring

Student achievement is affected by teacher execution and teacher perception of progress monitoring. Luckner & Bowen (2010) conducted a study where teachers working with deaf and hard-of-hearing students were interviewed over the phone using fourteen questions in a semi structured format. The interview and research focused on the use of progress monitoring in the field of deaf education. According to the researchers' findings, “The teachers who participated in the present study expressed highly positive perceptions of the value of using progress monitoring with students who are deaf or hard of hearing” (p. 403). While varied uses and applications of progress monitoring were recorded through the interview process, it was seen as a worthwhile tool. One of the participants reported that progress monitoring may take on a more central role in

education as teachers determine if students are making adequate progress toward goals and standards, which may call for a change in instruction and result in increased teacher accountability (Luckner & Bowen, 2010, p. 404). The study also noted the importance of assessments, including the impact of frequency and scheduling.

The purpose of progress monitoring is best supported through the resulting data and decisions made when progress monitoring. Three key themes emerged from the study by Luckner & Bowen (2010) as teachers described other educators who progress monitor, and these are supported throughout other research. A depiction of a teacher who has “precise, accurate, immediate knowledge about their students’ progress is described (p. 402). A balance of “instructional time, (and) making changes to instruction and interventions as the students needed them” was also present (p. 403). In conclusion, the team mentality that develops between student, teacher, and parent when all parties are “aware of the student’s strengths, weaknesses, and gaps, and enabling them to write more data-focused IEP goals to ensure that the student is progressing in an acceptable way” was second to none (p. 403).

Systematic Methods for Progress Monitoring

Extensive research exists concerning progress monitoring in special education and the processes that support fidelity. According to Rojo et al. (2022) “The article includes step-by-step strategies and guidelines for teachers to collect CBM data, create strategic IEP goals, and evaluate student progress” (p. 322). The researchers provide the following step-by-step process, in part to address what they define as the “new standard for documenting and ensuring student growth” which is necessary based on recent lawsuits and a need to achieve at a high standard (p. 328). The following is the recommended process for progress monitoring to increase student achievement according to Rojo et al. (2022):

Systematic progress monitoring involves following specific steps to enhance the fidelity of the progress monitoring process. The seven steps are (a) selecting an assessment tool that aligns with the student's goals, (b) preparing the student and materials, (c) obtaining baseline data, (d) calculating growth rates and IEP goals, (e) creating an assessment schedule, (f) documenting student progress, and (g) adjusting instruction as needed (see Figure 1). This method of gathering data provides teachers with valuable information regarding the rate of student improvement and the effectiveness of interventions. (pp. 322)

The method for progress monitoring is both measured and flexible in order to meet and challenge students in making growth and achieving new learning.

Progress Monitoring Schedule Effect on Student Achievement

Progress monitoring is a tool for both educators and students. It is essential that the use of this tool be balanced with consideration of developmental and academic demands on the students. The use of progress monitoring is shown through research to be effective based on strict periodic use in addition to intermittent use. "School-based professionals most often monitor student progress once per week" (Mellard et al., 2009, as cited in January et al., 2019, p. 120). However, research exists to support the fidelity of bimonthly progress monitoring (January et al., 2019). According to Luckner & Bowen (2010) "Progress monitoring results in more efficient and appropriately targeted instructional techniques and goals, which, together, move students to faster attainment of important state standards of achievement" (p. 397). It is important that the tool be used in the most effective and efficient manner to support student achievement.

The timing of progress monitoring affects the effectiveness of progress monitoring. Jenkins et al. (2017) studied the effects of intermittent progress monitoring on decision-making accuracy within progress monitoring. The authors sought to address the need for instruction time

in reading and how increased assessment requirements take away from this time. The authors found that students achieved the same growth when weekly and intermittent testing was utilized. Since then, Gesel & Lemons (2020), have published a study replicating and building on the study of Jenkins et al. (2017). Gesel & Lemons (2020) found similar results where “intermittent progress monitoring schedules sufficiently predicted student true growth compared to weekly progress monitoring” (p. 92) but they reported poorer timeliness and accuracy.

Research is lacking on the effects of progress monitoring in the band classroom and setting. The researcher was not able to locate other studies examining the effectiveness of progress monitoring and student achievement in band. Progress monitoring in band has the potential to increase student achievement. The benefits of progress monitoring abound as evidenced in research examined through this study. According to Luckner & Bowen (2010): Benefits of progress monitoring include 1. accelerated learning because students receive more appropriate instruction 2. more informed instructional decisions 3. more efficient communication with families and other professionals about students’ progress 4. documentation of student progress for accountability purposes 5. higher expectations of students on the part of teachers. (pp. 398)

In band class, students are diversified across four to eight different instruments. Progress monitoring is a way to assess and understand students' needs and meet these needs and deficiencies more accurately, which in turn increases student achievement. Communication with the parent and student can be supported by notes, fingerings, and pitches being learned (data) which in turn will create more student ownership of the learning. If students across the different instrument groups are involved in progress monitoring, the entire class will benefit from the higher expectation of students.

Other benefits of progress monitoring address the impact of instant scoring, reviewing errors, and visualization of errors. Quenemoen et al. (2003; as cited in Luckner & Bowen, 2010) state:

Among the advantages of progress monitoring over traditional assessments are that (a) it can be hand scored, (b) it allows educators to conduct error analyses to identify specific targets for intervention, and (c) through graphing of students' progress, it enables teachers, students, and parents to see how students are performing. (pp. 397)

Studying and researching the impact of progress monitoring demonstrates that there is great potential to apply the practice in band and see increased student achievement.

Purpose and Exploration of Self-monitoring for All Types of Students

Self-monitoring is a specific type of progress monitoring. By involving students in the process of progress monitoring through self-monitoring, data is both authentic and reachable. As stated by Rafferty (2010), "self-management interventions can be taught to and used by students from a wide variety of backgrounds and with a diverse range of abilities" (p. 51) including all grades and learning abilities and disabilities. In this section, the researcher will introduce self-monitoring and explore its use within the content area of the researcher. The researcher will identify issues with self-monitoring, examine the use of self-monitoring when prompted by tactile cues, student completion and accuracy in homework when self-monitoring, and application of self-monitoring to attention versus performance.

Self-monitoring

Progress monitoring can encompass self-monitoring. When a student is self-monitoring, data can be generated and used to make educational decisions to benefit and increase the achievement of all types of learners. According to Bruhn et al. (2021) the accuracy of the

students' self-monitoring is the primary role of the teacher in the intervention. Progress monitoring can be successfully implemented with all types of learners. Porter (2002), Rutherford et al. (1996), and Vaughn et al. (2000) (as cited in Falkenberg & Barbetta, 2013) state:

Self-monitoring is a cornerstone of cognitive-behavioral social skills training approaches (e.g., Crum 2004; Patton et al. 2006) and has been used with students of all ages with and without disabilities (DiGangi et al. 1991) The ability of a student to self-monitor is a natural step toward becoming independent, which happens when taking personal responsibility for his or her behavior. (pp. 191)

The purpose and practice of self-monitoring is applied to academics, behavior, and attention (McDougal et al., 2012). "Self-monitoring involves two processes: self-observation and self-recording. Self-observation requires students to pay attention to a specific aspect of behavior, and discriminate whether the behavior being monitored has occurred" (Amato-Zech et al., 2006). It can be likened to self-directed learning, but it is important to note the distinction between self-directed or self-starting versus self-monitoring which consists of self-observation and self-recording.

Studies and research of self-monitoring of special education students and research completed in the general education classroom support the claim that self-monitoring benefits all types of student learners (Furey & Loftus-Rattan, 2022; Amato-Zech et al., 2006; Falkenberg & Barbetta, 2013; Harris et al., 2005; McDougall et al., 2012). The application of self-monitoring in band class lacks research and data to date. Research regarding the use of self-monitoring with different types of learners in band is also lacking. There is a need for exploration of self-monitoring for all types of learners in band and the academic implications that may be generated through its implementation.

Issues with the Practice of Self-monitoring

Issues exist with the practice of self-monitoring. There is acknowledgment and documentation of the issue of validity when using participant self-evaluation. Kanfer (1970) presented an article on issues concerning the use of self-observation raised in an experiment. This included difficulties in ascertaining the reliability of self-reports for events that have no external reference. The same issue of validity of self-monitoring is documented in studies by Bruhn et al. (2021). The study found that there was a strong positive relationship between the teacher and student self-monitoring ratings, students rated themselves higher than teachers, and there was considerable variability in the strength of the relationship across individual students. Another issue is the potential for creating dependence while using self-monitoring. This issue is identified, and a solution is presented in the research of McDougall et al. (2012). This issue can be addressed by utilizing the option to fade the use of self-monitoring and cueing over time. Other ideas generated by the research by McDougall et al. (2012) include setting a specific amount of work to be completed (goal setting) and determining a schedule.

Tactile Cues

Amato-Zech et al. (2006) and McDougall et al. (2012) both researched the use and effectiveness of a tactile cue to prompt self-monitoring. McDougall et al. (2012) examined the ease of tactile cued self-monitoring to improve productivity during independent tasks through two studies. One study followed a high school student with ADHD in a general education math class while the second followed a middle school student with emotional disturbance in a self-contained special education program at the middle school. In the math classroom, the study collected data on how many questions were answered and the accuracy of the responses. In the second classroom data was collected on task completion in minutes taken to answer the word-of-

the-day task. Both students increased their independent task completion by a fact of about three. Study one's participant increased from a mean of 21% to a mean of 66%. Study two resulted in a work time decrease from 30 minutes to 11 minutes. Amato-Zech et al. (2006) explored on-task behaviors in the classroom and self-monitoring strategies. Three fifth grade students participated in the study, which took place in a special education classroom. The use of a tactile cue was also used as the intervention and resulted in an increase of 50% on-task behavior to 90% in the intervals observed and study participants also relayed a high rating of treatment acceptability.

The application of tactile cues to prompt self-monitoring will support all types of learners. Prompts or cues to self-monitor could be visual, audible, or tactile. Research by Amato-Zech et al. (2006) found that the application of the MotivAider, a tactile prompt, is an effective and practical intervention to cue self-monitoring. In the research setting, students had both behavioral challenges and learning difficulties and the research findings support the effectiveness of the MotivAider in aiding students to self-monitor and produce accurate and complete work. In the research of McDougall et al. (2012) "student performance in both studies improved by a factor of about three after students used TCSM (tactile-cued self-monitoring)" (p. 127). The practical implications for the use of these findings in school include relative time effectiveness and ease, which include fewer demands on the teachers' time, and on-task behaviors without support from tangible rewards. Kanfer's (1970) research supports these claims as well demonstrating that "self-monitoring leads to heightened awareness of a target behavior and subsequent behavior change" (as cited in Amato-Zech, 2006, p. 218).

Self-monitoring of Homework Completion and Accuracy

Student self-monitoring of homework completion was studied by Falkenberg & Barbetta (2013) and the findings indicated evidence for the effectiveness of the practice through special

education students' use of self-monitoring. The research took place in an inclusive classroom and at home following four students in fourth grade who had documented disabilities. The students completed self-monitoring during homework completion. Students had a three-part package consisting of a brief conference with the special education teacher, tips for homework in written form kept at home and initialed by parents, and self-monitoring at school completed on the computer.

The self-monitoring package utilized by Falkenberg & Barbetta (2013) led to higher percentages of both math and spelling homework completion and accuracy during each phase of the intervention compared to baseline data. These improved performances were maintained when the intervention was reduced in frequency. The benefits of self-monitoring identified by Falkenberg & Barbetta (2013) include prompt feedback, concrete illustrations of behavioral improvements, actively engaged participants, individual buy-in, self-selected areas for improvement, decreased need for adult supervision, easy implementation, cost-effectiveness, relatively unobtrusiveness, and general effect on a teacher's time freeing up time for other classroom responsibilities.

Self-monitoring of Attention versus Performance

Harris et al. (2005) research examined self-monitoring of attention versus self-monitoring of academic performance. The study followed six elementary-aged students in a general education classroom. The methodology for the research was built as a counterbalanced, multiple-baseline, across-subject design. The researchers found that both self-monitoring academic performance and self-monitoring attention had a positive effect on student's on-task behavior. More correct practices were attained through self-monitoring of performance. This study demonstrates the value of self-monitoring for students in the general education classroom.

Application and Effectiveness of Self-Monitoring on Student Achievement

Self-monitoring is effective in the scope of progress monitoring and results in increased student achievement. According to Wells et al. (2017):

Self-monitoring of performance has been successfully used to improve students' rates of work completion and accuracy (Harris, Friedlander, Saddler, Frizzelle, & Graham, 2005). This practice focuses student attention on specific aspects of academic performance—such as number and/or accuracy of problems completed—rather than on self-monitoring of attention to on-task behavior. In self-monitoring of performance, the student is taught to self-assess and record a specific academic skill, such as the number of math problems completed correctly. (pp.58)

This section will examine the effectiveness of self and peer-monitoring on achievement, the use of self-monitoring by teachers to support best practices which in turn increase student achievement, and the support of claims that student achievement is increased through self-monitoring as supported in previously summarized studies.

Self and Peer-monitoring on Achievement

Kim et al. (2018) studied the effects of self and peer-monitoring on social studies performance of students with learning disabilities and low-achieving students. The research questions specifically examined the effect of vocabulary knowledge on the acquisition of vocabulary and acquisition of content knowledge. The study included a large database with 10 elementary school teachers in two elementary buildings in Korea totaling 209 4th grade student participants. The intervention tested took place during the fifth and final step in the routine; independence adding in a self and peer-monitoring strategy. The findings showed a significant effect applied to content knowledge acquisition of both low achievers and students with a learning disability and when comparing pre and post-test scores, students in the intervention

group gained at least four new words. Self-monitoring is an effective practice to increase student achievement as reported in the research of Kim et al. (2018).

Teacher Self-monitoring Use

Hager (2018) studied the use of video recording in teacher self-monitoring. The researcher sought to identify an effective strategy to support evidence-based practices in instructional delivery. The article is composed of outlined steps for implementing video recording to self-monitor. The steps are ordered as follows:

1. Obtain required consents.
2. Identify the video-recording procedures and equipment.
3. Select the instructional group and time of focus (e.g., during mathematics, transition after lunch).
4. Collect sample video and select target behavior(s).
5. Develop a data collection sheet.
6. Code and graph baseline data.
7. Identify target criterion.
8. Video-record and collect data.
9. Monitor progress.
10. Record maintenance data. (pp. 285)

Hager (2018) states that “implementing a video self-monitoring program is an evidence-based strategy that enables you to identify how well you are implementing effective teaching strategies and provides a strategy to improve your performance” (p. 289). When addressing step nine, monitoring progress, the author suggests graphing when making data-based decisions. By doing so, teachers can see progress and trends visually and may be motivated by the result. The

use of a process allows for control and analysis throughout the process. In conclusion, the benefits of self-monitoring are extensive for teachers and students.

Student Achievement Increase Evidenced through Previous Studies

In the second section of the literature review, *Purpose and Exploration of Self-monitoring for All Types of Students*, several studies were summarized and referenced through the lens of all students learning and benefiting from progress monitoring. The same studies support the argument that student achievement is increased through progress monitoring. For example, in the study by McDougall et al. (2012) and Amato-Zech et al. (2006), findings indicate that students achieved more independent tasks, work completion, and accuracy of work. Student achievement was increased when the self-monitoring intervention was instituted. Similarly, in the study by Harris et al. (2005) the findings indicate growth when the students' progress monitored both performance and academic achievement. Multiple studies support the claim that self-monitoring is an excellent strategy to increase student achievement, and yet research is lacking in the application of self-monitoring in the band classroom and around student acquisition of new notes.

Application of Self-graphing on Student Achievement

Student achievement is influenced by interventions and the application of self-graphing can produce positive increased outcomes. According to Hirsch et al. (2013):
Having students record and graph their behavior also can increase the effectiveness of self-monitoring (DiGangi, Maag, Rutherford, 1991) and conceivably enhance student motivation (Harris, Graham, Reid, McElroy, & Hamby, 1994). In addition, a student could record and graph data simultaneously on two types of responses (i.e., both academic and behavior). (pp. 32)
The use of self-graphing as a type of progress monitoring was addressed by the publication of

Hirsch et al. (2013). The authors referenced fictitious third-grade students and teachers to illustrate the implementation of self-monitoring. This topic, which focused on “using the skill of student self-graphing to enhance the effects of an intervention and increase student motivation” (p. 38) is presented as an article format to inform interested stakeholders about implementing self-graphing. It provides support with outside research data for the purpose and practice of self-graphing, specifically how it could help with teacher time efficiency. Display, reward, when to graph and lack of progress make up a suggestion section of considerations and tips. According to Harris et al. (1994; as cited in Hirsch et al., 2013) “Self-graphing is a practice that can be added to academic, behavioral, or social interventions to increase the effectiveness of the intervention (e.g., McDaniel et al., 2012) and student motivation (e.g., Harris et al., 1994)” (p. 36).

In considering application of self-graphing to social skills, the author suggests, “instruction paired with reinforcement and self-graphing...Self-graphing is a tool that can be added to a social skill intervention to allow a student to see a visual representation of his or her performance” (p. 35). Self-graphing can also be effectively paired with goal setting and creates a powerful visual. Motivation can result from self-graphing and visual stimuli (Carr & Punzo, 1993; DiGangi et al., 1991; Harris et al., 1994; as cited in Hirsch et al., 2013). This is affirmed in the publication by Harris et al. (1994), Hirsch et al. (2013), Sheehey et al. (2016) (as cited in Wells et al., 2017) that states “adding self-graphing to the self-monitoring procedures enhances the impact of the intervention (Gunter & Denny, 2004), with the visual feedback increasing the student’s motivation to improve his or her academic performance” (p. 58).

Another application of self-graphing is in the area of behavior. The author states: Self-monitoring strategies, including self-graphing, in which students evaluate behavioral performance, are effective in reducing problematic behaviors and increasing prosocial behaviors

(Hughes et al., 2002). DiGangi et al. (1991) found that the effectiveness of self-monitoring was enhanced when student data were graphed by the students. (pp. 34)

Self-monitoring may also improve student outcomes and assist with the demands on teachers' time.

In considering the implementation of self-graphing in band it is helpful to remember the advice of Hirsch et al. (2013) who states, "Whenever a self-graphing strategy is added to an academic, behavioral, or social intervention, teachers should initially spend time teaching all students how to graph their performance, either by hand or electronically" (p. 32). The time necessary to complete this task and maintain the student's experience and high level of fidelity in the process is crucial. If self-graphing as a progress monitoring and self-monitoring practice is to be introduced to band classes and further research is pursued, proper education and introduction to self-graphing are essential as noted by Hirsch et al. (2013).

Teaching Self-Monitoring

An article by Rafferty (2010) presents information on teaching students to self-monitor, with a specific focus on self-regulation, and includes information about self-graphing. Self-monitoring is one of five types of self-management practices cited in the article by Rafferty (2010). The other practices include goal setting, self-evaluation, strategy instruction, and self-instruction. Self-regulating results in many benefits, which are generated by interventions like self-monitoring and graphing. According to Zimmerman (2002; as cited in Rafferty, 2010): "Students who effectively use self-regulatory processes or self-management skills tend to have higher levels of self-efficacy, motivation, and school achievement" (p. 52). The process outlined by Rafferty (2010) includes the following steps: "Identify the target behavior, operationally define the target behavior, collect baseline data, determine if it is an appropriate behavior to

remediate, design procedures and all materials, teach the student how to self-monitor, monitor student's progress, and fade use of interventions" (p. 52-56).

Self-graphing could very easily be applied to the acquisition of new notes in the process of learning to play a musical instrument in band. Students could plot points for each session recording the total number of notes they can produce to see progress and acquire motivation. Research concerning the application, process, and findings in self-graphing are lacking at the time of this action research plan's publication. The most helpful data and material for furthering the study and application of self-graphing in band would be specific practices and teaching aids to create easy integration into the classroom with multiple instruments and differing challenges.

Self-graphing and performance in self-monitoring

The work of Wells et al. (2017) examined self-monitoring of performance with self-graphing. The article states the purpose as being to increase academic productivity in math. According to the author, "Self-monitoring of performance with self-graphing is an intervention that can increase a student's self-regulation skills and facilitate independent self-monitoring, thus reducing off-task behavior" (p. 63). The process for this involves the following steps: "The teacher will need to (a) identify the target academic performance, (b) decide on the implementation procedures, (c) prepare the student to commit to trying the intervention, (d) teach the student the procedures, and (e) monitor the student's progress" (p. 64). This shares many similarities with the work and process presented by Rafferty (2010) but lacks some specificity.

Self-recording and Goal Setting

Moore et al. (2001) examined self-recording with goal setting as a classroom management tool. The purpose of the study was to research the effectiveness of simple self-management programs, which include self-recording and goal-setting procedures, in a classroom

setting with students who show limited on-task behavior. Three 8-year-old boys were study participants from a large multicultural suburban primary school. The intervention entailed students self-recording their on-task behaviors with goal setting in mind. The results showed a substantial increase in on-task behavior with the introduction of the intervention and generalization to other subjects occurred for two out of three participants. “However, an additional important reason for employing self-management strategies in preference to more teacher-centred antecedent or contingency management procedures is that the consequent behaviour change may maintain better over time (Lazarus, 1993; O’Leary & Dubey, 1979)” (as cited in Moore et al., 2001, pp. 256).

Methods

Participants

The action research study examined a fifth-grade band section, made up of students playing flute enrolled in band class in the spring of 2023. Nine students participated in learning new notes at a range of zero to five notes at each monitoring session. Students completed monitoring weekly over a month, completing a self-monitoring portion and a teacher monitoring portion. Student demographics include the following: one Hispanic student and eight Caucasian students. Student socio-economic status includes three students receiving free or reduced lunch. Two students are identified with IEPs.

The research will be completed at Humboldt Middle School and St. Mary’s Catholic School in Humboldt, Iowa. Research assessments will be completed during lessons and study hall. Fifth-grade students are enrolled in a general music course at both schools respectively in addition to electing to be part of band beginning in fifth grade. Students have been consistently attending weekly lessons since September of 2022. Students are encouraged to practice, but there

is no school-level monitoring or enforcement. Students will participate in group band class every other day. Instructions for progress monitoring will be given during lessons and repeated in group band class before, beginning, and, during the progress monitoring cycle.

Measures and Procedures

The assessment being used to collect data was specifically created and designed for this action research plan. In attempting to ensure reliability in the study, the researcher used the same assessment protocol regardless of the type of monitoring being completed. In implementing validity in the action research study, the researcher used a complete flute fingering chart with a replica flute fingering template for the assessment portion. The assessment pertained to the three parts of the research question: play, explain, and recognize. The students needed to correctly answer each part of learning a note, outlined in the research question, for it to be considered learned. The validity of the research is supported because the assessments addressed the number of new notes a student learned over the course of the research cycle. The assessment format can be replicated with different instruments in future studies.

Over four lesson cycles (four calendar weeks) the teacher and research participants (students) monitored new note acquisition. The students completed a pre-test to establish what pitches they could already explain, play, and recognize, establishing the collection of notes deemed prior knowledge. Students were separated into groups based on their lesson times to support teaching of the processes used to self-monitor. Group one consisted of six students while group two had three. One group completed the process beginning with self-monitoring for two weeks followed by teacher-monitoring for two weeks SMTM (self-monitored then teacher-monitored) while the other group completed the process in the opposite order TMSM (teacher-monitored then self-monitored). Students were asked to show the placement of fingers on the

instrument and the notes location on the music staff. The researcher recorded this information as the scribe for the student and verified correct transcriptions of fingers and staff placement with the students. The total number of notes learned provided data to address the research question at the completion of SM and TM cycles. The data was collected with paper and pencil assessments and recorded on an Excel spreadsheet. A dependent t-test will be used to interpret the data and create graphs for data analysis.

After completing the pre-test, students were given a fingering chart with all the notes possible in their instrument, referred to as a fingering chart. When students SM, they selected the notes and recorded them on a separate piece of paper. They recorded the note name, staff location, and filled in the fingering on a flute key template (see Appendix A). No directive was given or enforced surrounding the number of notes a student should select. When students were in the TM phase, the teacher selected between three and five new notes to be learned before the monitoring session. The number of notes assigned was based on the teacher's perception of the student's comfort level and challenge potential. When selecting the student's notes, the researcher pointed out similarities between prior knowledge and new notes and shared helpful analogies for remembering them.

The researcher considered and identified the following variables when creating and designing the action research. The independent variable in this action research study is the student or teacher completing the progress monitoring. The dependent variable will be the student's rate of acquisition of new note knowledge. Other variables in the action research include lesson attendance, school attendance, IEP/TAG/ELL status, years of experience on the instrument, practice time outside of class, and motivation to learn new notes.

The action research project was developed, and the Institutional Review Board granted

exemption through Northwestern College to complete the research. The research included normal education practices with teaching student's new notes. The action research focused on new note acquisition, which is normally dictated by the scope and sequence of the lesson book. The intervention focused students solely on new note acquisition. The data was confidential from other students within the group.

Data Collection

The following research question will be used to guide the data collection, which results in quantitative data:

Are students able to demonstrate a higher rate of new note acquisition (including the ability to play/explain/recognize new pitches) when monitoring their own performance as compared to when their performance is monitored by the teacher?

Students completed the pre-test during study hall under the researcher's supervision. The pre-test collected data on what notes students could play, explain, and recognize. Students struggled with some formatting differences but asked clarifying questions to demonstrate their understanding and present the most accurate depiction of their understanding in the pre-test. Pre-test assessments were scored, and students were given instructions on their first rotation. Through the pre-test, necessary areas of teaching were established. An introduction to sharps, flats, and naturals, which are additional symbols that change the note, needed to be taught for the students to successfully contribute to this action research plan. Data from the pre-test was entered into the Excel sheet for raw data collection.

Students were placed into two groups based on their lesson time and grouping and the researcher's discretion. When students were in the TM cycle, the teacher selected and assigned the notes to be learned. Once a note was learned it was highlighted on the fingering chart.

Students in the SM cycle were instructed to self-select their notes from the fingering chart and monitor themselves by adding their selections to the fingering template. Once the note was assessed and learned it was highlighted on the fingering chart and the fingering template. The fingering template was a blank assessment in order to maintain familiarity and consistency in format which was used for students to collect their self-selected notes. When assessing students, whether they were in the SM or TM cycle, the teacher scribed as the student named the note, demonstrated the fingering, and explained the location of the notes on the music staff. Progress monitoring of both groups took place during the spring of 2023.

Each assessment, completed every three to seven days, was scored by hand and entered into the Excel sheet as progress monitoring was completed. The note's staff location, name, and fingering were recorded in the assessment and scored. All three elements had to be correctly addressed for the note to be marked as learned. After monitoring twice in the TM or SM cycle, which took about two weeks, students were switched to the opposite progress monitoring group. Students were given instructions for the opposite cycle of progress monitoring. Progress monitoring took place during lesson periods and pull-out time.

Findings

Data Analysis

The type of data analyzed in this study is quantitative. The data will be interpreted through the research question, which asks: Are students able to demonstrate a higher rate of new note acquisition (including the ability to play/explain/recognize new pitches) when monitoring their own performance as compared to when their performance is monitored by the teacher? The research question resulted in a four-cycle period with two rotations. Progress monitoring was completed in intervals between three and eight days. Student one through six completed teacher-

monitoring for two cycles and then student-monitoring while student seven through nine completed student-monitoring for two cycles and then teacher-monitoring for two cycles.

In Table 1 (see below), students are numbered one through nine and their note acquisition for the two teacher monitoring cycles are displayed. Students seven, eight, and nine acquired ten new notes each when teaching monitoring and significantly decreased with an average of 4.33 new notes when student monitoring. These students completed teacher monitoring first, followed by student monitoring. Meanwhile, students one through six ranged from three to seven new notes acquired when teacher monitoring and one to seven when student monitoring. These students completed student monitoring first followed by teacher monitoring.

Table 1

Comparison Data from Action Research

Student	Teacher Monitored	Student Monitored
1	3	6
2	6	3
3	6	1
4	5	3
5	4	5
6	7	7
7	10	5
8	10	3
9	10	5

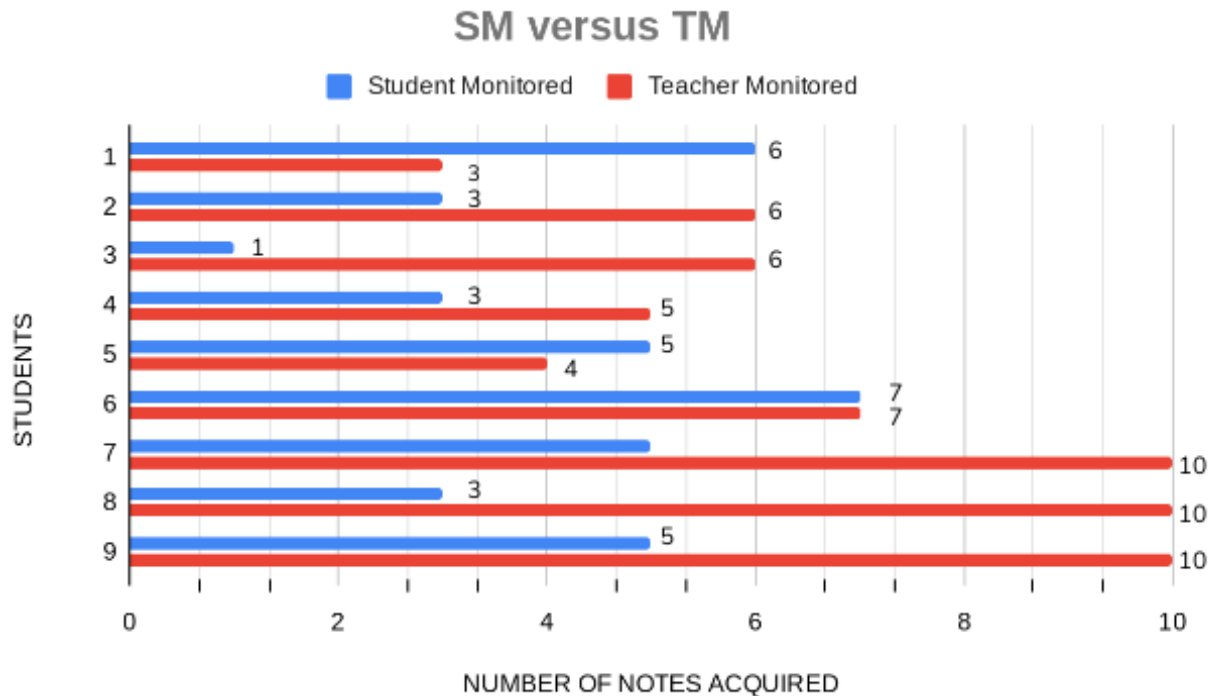
The researcher thought that students who completed teacher monitoring first, and netted a significant success rate, would strive to learn more notes when self-monitoring. However, they decreased the number of new notes they selected to learn and did not challenge themselves with a high volume of new notes, but instead pursued perfection with smaller numbers of notes. The counterargument is that students seven, eight, and nine learned most of the easier notes when teacher monitoring and then were left with more difficult notes when self-monitoring, which resulted in less volume of new notes acquired. Students who self-monitor first were at a bit of a disadvantage as their first progress-monitoring experience was self-monitoring, which included far less structure from the teacher. This is supported by the fact that in the first rotation students one through six averaged between four and five new notes while students seven through nine averaged ten new notes.

The data analysis tool used to interpret the action research was the dependent t-test and the results are also displayed in bar graphs. The bar graph (see Figure 1 below) is set up with the students numbered one through nine and the notes learned as the student completes monitoring. The number of notes in each bar is the total acquired over both cycles. The bar graph shows that seven out of nine students learned more notes when the notes were selected and monitored by the teacher. Students two, seven, eight, and nine learned at least twice as many notes when teacher monitoring. Of the students who scored more learned notes when self-monitoring, student one learned twice as many notes when self-monitoring, and student five learned one more note when self-monitoring as compared to teacher-monitoring. The most new notes learned in a cycle was ten while the fewest learned in a cycle was one. The largest variance between teacher and self-monitoring occurred with student three who learned one note when self-monitoring and six notes when teacher monitoring. When totaling the notes learned in both data sets, teacher monitoring

resulted in 61 learned notes while student monitoring resulted in 38 learned notes.

Figure 1

New Note Acquisition When Teacher-Monitoring Versus Self-monitor



The data collected during the action research project, when run through the dependent t-test, shows that teacher monitoring ($M = 6.78$, $SD = 2.68$) resulted in more notes learned by students than student monitoring ($M = 4.22$, $SD = 1.86$) (See Table 2 below). The dependent t-test sample test is displayed below. Student 1 is considered an outlier in teacher monitoring and Student 3 is considered an outlier in student monitoring. Student 1 is the only student who scored higher when self-monitoring. A majority of students learned more notes in the teacher-monitoring cycle when comparing each student's teacher-monitoring to self-monitoring. In teacher monitoring the mean number of new notes learned was 6.77 as compared to the self-monitoring cycle where the mean was a little more than two notes higher at 4.22 new notes. No data points were missing due to illness, absence, or extenuating circumstances and nine students were observed.

Table 2*Dependent T-test Results*

	Variable 1	Variable 2	
Mean	6.777777778	4.222222222	
Variance	7.194444444	3.444444444	
Observations	9	9	
Pearson Correlation	-0.03906045657		
Hypothesized Mean Difference	0		
df	8		
t Stat	2.308673821		
P(T<=t) one-tail	0.02489602952		
t Critical one-tail	1.859548038		
P(T<=t) two-tail	0.04979205905		P = .05
t Critical two-tail	2.306004135		Difference is significant

While it would be preemptive to state that the data supports the sole use of self-monitoring over teacher-monitoring, as the researcher hypothesized, there is data to support the use and effectiveness of progress monitoring with students in band. In Figure 1 and Table 1 the data supports the claim that student achievement varied significantly based on the type of progress monitoring being completed. Trends were identified in the paragraphs above, but they only begin to examine the topic and further research is necessary. The practice of progress monitoring is however effective as it was the key catalyst for students' acquisition of ninety-nine new notes between teacher and self-monitoring over the four-cycle research period. Students

engaged with the topic of the action research and were curious and driven to learn new notes, whether teacher or self-monitored.

Discussion

Summary of Major Findings

The findings of this study outline student achievement when progress monitoring. Students learned to play, recognize and explain notes through teacher and self-monitoring forms of progress monitoring. The results of the study show that students reached a higher number of notes while completing teacher monitoring. Nine students learned 99 new notes through the process of progress monitoring. Specifically, teacher monitoring resulted in 61 learned notes while student monitoring resulted in 38 learned notes.

When students self-monitored, they participated in a form of self-graphing. Students highlighted notes on their master fingering chart as they attained mastery, and this practice mirrors self-graphing in many regards. The purpose of the practice is to allow students to visualize their growth and achievement, as written by Hirsch et al. (2013). The authors were examining self-monitoring and its effectiveness on specific interventions and student motivation. Wells et al. (2017) support this finding of the effectiveness of self-graphing as it allows for visual feedback. Students were progress monitored by the teacher and achieved a higher number of notes during this cycle. However, the process of self-monitoring was new to the students, whereas progress monitoring, completed by the teacher, is a common experience for students. The researcher believes the students thrived on having an assignment selected for them, in order for them to have a number to compare their achievement against.

The findings and process of completing action research bring urgency to the researcher's implementation of new note acquisition lessons across the different instruments. It also brings

attention to the benefits of progress monitoring in band and the value of involving the student in the process. Rafferty (2010) documents the effectiveness of self-monitoring with all types of learners across grade levels. This is encouraging as the researcher branches out to utilize these techniques from fifth to eighth grade. The inclusive learning environment in band is crucial and vital to the researcher's personal philosophy and the goals of public education. In Furey & Loftus-Rattan (2022) the use of progress monitoring with students who have disabilities is documented and its successful implementation gives the researcher more confidence in implementing this practice in band. Self-monitoring is also documented by Falkenberg & Barbetta (2013) with all types of students.

It is the researcher's opinion that a mixture of both types of progress monitoring is the best practice for student achievement and engagement. Student monitoring is constantly questioned for reliability and it is extremely valuable for the teacher to interact directly with the student when progress monitoring. For example, learning new notes on an instrument requires separate techniques and processes which the teacher is specifically trained and equipped to teach the student. If the student only self-monitors, it may result in difficulty. The process for teaching and implementing both types of progress monitoring will continue to be improved and more clearly follow the six-step progress monitoring process outlined by Furey & Loftus-Rattan (2022). This includes, "explicit performance feedback; specific, true, and positive feedback; collaborative data graphing; collaborative data analysis; reflective questioning; and collaborative goal setting" (Furey & Loftus-Rattan, 2022, p. 330).

One reason for the urgency in beginning to implement these practices is that the use of self-monitoring is a self-regulatory process which is a high needs area in the researcher's experience. The other benefits of self-monitoring as documented by Falkenberg & Barbetta

(2013) and observed in this action research include actively engaging participants, individual buy-in, decreased need for adult supervision, and concrete documentation of improvements.

Limitations of the Study

This study is original in nature and therefore numerous limitations exist. There is a lack of previous research on progress monitoring on students in band, and the assessments used for data collection have not been tested. The number of students who participated in the study was nine out of a group 90 and only one type of instrument was studied. The challenges of learning new notes vary based on the instrument and required technique and facial muscles. The research was completed in the spring of fifth grade, it would look different depending on students' progress in acquiring new note knowledge. Prior student knowledge, while measured, will impact student grasp and cataloging of new information. It may be assessed once a student demonstrates an understanding of x number of notes, instead of in a blanket timeline based on a calendar date. The frequency of monitoring may also affect the results. The amount of time and pre-teaching significantly impacted the data generated from the assessments. More growth or significant difference between strategies for progress monitoring may result if a longer period is assessed.

Flute students are often stereotyped, and usually rightfully so, as type A students. This may also play into the results of students' completing teacher and self-monitoring. The weather could have affected the days available to collect data, however, the only impact on the study was the increase in nice weather which tends to make the students' minds wander. Another issue is student absences prior to and during data collection. The existing relationships between the students and teacher (researcher) may have impacted student buy-in in addition to their engagement, enjoyment, and attitude in band class.

Further Study

The findings from this study of new note acquisition kindle the researcher's interest in best practices for teaching new notes and the use of progress monitoring in the process. Students learned 99 new notes through two types of progress monitoring, which established the value of the practice for the researcher. Curiosity exists as to whether more efficient or affective practices exist. Further studies on this topic are necessary to justify and support the findings. It is also worth exploring the potential applications of progress monitoring to other topics in music such as learning scales, rhythm reading, and memorization. Additional studies should compare new note acquisition and the effectiveness of progress monitoring in fifth versus sixth grade band students, considering their years of experience.

A longer time period with more in-depth progress monitoring is also worth exploring in the future. Students completed a pre-test and four cycles, which lasted about a month. When progress monitoring and looking for further impact, future studies should consider sharing results with parents and involving them in the student's process and growth. Students highlighted their progress, but an additional step might be for students to show a parent and have them initial. In teacher monitoring, there is better differentiation based on learning styles, and tricks for remembering notes, like how an E5 is played with the fingers used to make peace signs. These tricks are taught alongside assigning a new note to be learned. Students learned an average of six notes when teacher monitoring compared to two when self-monitoring, which supports the idea. Further research is also necessary to examine new note acquisition in the different instruments as they each hold different limitations to learning new notes.

Another future step could be to continue to monitor the current group of students and their implementation of the new notes they have learned in their music and lesson book playing.

Students learned an average of 11 new notes. The next step is to maintain the knowledge and understanding of those notes as they are applied to the music they are playing. In addition, observations of their learning of future new notes could be examined. These examinations could be done formally and informally by the researcher. The action research process required formal documentation; therefore, results are available and able to be presented in this paper. But the process could be duplicated with less formality to attempt to address other topics or areas of growth. The general premise of examining the effectiveness of teacher and student progress monitoring in band could also be studied in other grade levels. For example, a study could examine the sixth grade class when learning scales while using teacher and self-monitoring. This would allow students who learned an average of 11 new notes to apply them to scales where the student would reuse the progress monitoring process. Students could use their experience and the data from this action research plan to select a type of progress monitoring for this next step. There is also potential for implementation of these practices by other band teachers, but at this stage it may be better suited as research partners than implementing the exact process outlined in this study, given the lack of research on the topic.

Conclusion

This action research plan examined the implementation of progress monitoring into the band classroom. The effectiveness of student and teacher progress monitoring was compared. The study was implemented with fifth grade students learning new notes on the flute in the spring of 2023. Throughout the process, the students and teacher increased awareness of success and achievement through progress monitoring that took place over four cycles. The students were placed into two groups and worked concurrently through two different types of progress monitoring. Students completed two cycles of self-monitoring and two cycles of teacher

monitoring. The purpose of this study was to identify any achievement differences between student and teacher progress monitoring. There is a lack of research on the implementation of progress monitoring in the band classroom or on the process of learning new notes. However, significant research exists to support the use and implementation of progress monitoring and self-graphing with all types of learners, and this informed the researchers formation of the literature review and the resulting study.

Quantitative data was gathered throughout the study when students participated in both types of progress monitoring. The findings were correlated and examined through a dependent t-test and a bar graph. Nine students learned 99 new notes over the course of the action research study. Between both types of progress monitoring the new notes achieved by a student in a cycle ranged from one to ten. When students self-monitored, they averaged 4.22 new notes. When the teacher monitored the students averaged 6.77 new notes. The results of this study indicate a greater rate of acquisition when teacher monitoring took place. While this is a significant difference, the researcher considered the purpose and value of both types of progress monitoring, which revolve around student choice and the hypothesis that variety will result in better long-term outcomes. This would be considered an area of future study. Overall, the study supports the general implementation of either type of progress monitoring in the band classroom.

References

- Amato-Zech, N. A., Hoff, K. E., & Doepke, K. J. (2006). Increasing on-task behavior in the classroom: extension of self-monitoring strategies. *Psychology in the Schools, 43*(2), 211-221.
- Bruhn, A., Barron, S., Copeland, B., Estrapala, S., Rila, A., & Wehby, J. (2021). A comparison of teacher and student ratings in a self-monitoring intervention. *Assessment for Effective Intervention, 46*(4), 316-321. <https://doi.org/10.1177/1534508420944231>
- Falkenberg, C. A., & Barbetta, P. M. (2013). The effects of a self-monitoring package on homework completion and accuracy of students with disabilities in an inclusive general education classroom. *Journal of Behavioral Education, 22*(3), 190-210.
- Furey, J., & Loftus-Rattan, S. (2022). Actively involving students with learning disabilities in progress monitoring practices. *Intervention in School and Clinic, 57*(5), 329-337. <https://doi.org/10.1177/10534512211032618>
- Gesel, S. A., & Lemons, C. J. (2020). Comparing schedules of progress monitoring using curriculum-based measurement in reading: a replication study. *Exceptional Children, 87*(1), 92-112.
- Hager, K. D. (2018). Teachers' use of video self-monitoring to improve delivery of effective teaching practices. *TEACHING Exceptional Children, 50*(5), 283-290. <https://doi-org.ezproxy.nwciowa.edu/10.1177/0040059918765749>
- Harris, K. R., Barbara, D. F., Saddler, B., Frizzelle, R., & Graham, S. (2005). Self-monitoring of attention versus self-monitoring of academic performance: effects among students with ADHD in the general education classroom. *The Journal of Special Education, 39*(3), 145-156. <https://doi.org/10.1177/00224669050390030201>
- Hirsch, S. E., Ennis, R. P., & McDaniel, S. C. (2013). Student self-graphing as a strategy to increase

teacher effectiveness and student motivation. *Beyond Behavior*, 22(3), 31-39.

<http://www.jstor.org/stable/24011901>

- January, S.-A. A., Van Norman, E. R., Christ, T. J., Ardoin, S. P., Eckert, T. L., & White, M. J. (2019). Evaluation of schedule frequency and density when monitoring progress with curriculum-based measurement. *School Psychology*, 34(1), 119-127.
- Jenkins, J., Schulze, M., Marti, A., & Harbaugh, A. G. (2017). Curriculum-based measurement of reading growth: weekly versus intermittent progress monitoring. *Exceptional Children*, 84(1), 42-54. <https://doi.org/10.1177/0014402917708216>
- Kanfer, F.H. (1970). Self-monitoring: Methodological limitations and clinical applications. *Journal of Consulting and Clinical Psychology*, 35, 148-152.
- Kim, W., Ok, M. W., & Yoo, Y. (2018). The effects of self- and peer-monitoring in social studies performance of students with learning disabilities and low achieving students. *Learning Disabilities Research & Practice*, 33(2), 87-98.
- Luckner, J. L., & Bowen, S. K. (2010). Teachers' use and perceptions of progress monitoring. *American Annals of the Deaf*, 155(4), 397-406. <http://www.jstor.org/stable/26235080>
- McDougall, D., Morrison, C., & Awana, B. (2012). Students with disabilities use tactile cued self-monitoring to improve academic productivity during independent tasks. *Journal of Instructional Psychology*, 39(2), 119-130.
- Mellard, D. F., McKnight, M., & Woods, K. (2009). Response to intervention screening and progress-monitoring practices in 41 local schools. *Learning Disabilities Research & Practice*, 24, 186-195. <http://dx.doi.org/10.1111/j.1540-5826.2009.00292.x>
- Moore, D.W., Prebble, S., Robertson, J., Waetford, R., & Anderson, A. (2001). Self-recording with goal setting: A self-management programme for the classroom. *Educational Psychology*, 21,

255–265. DOI: 10.1080/01443410120065469

Quenemoen, R., Thurlow, M., Moen, R., Thompson, S., & Morse, A. B. (2003). Progress monitoring in an inclusive standards-based assessment and accountability system (synthesis report 53).

Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Retrieved from <http://education.umn.edu/NCEO/OnlinePubs/Synthesis53.html>

Rafferty, L. A. (2010). Step-by-step: teaching students to self-monitor. *Teaching Exceptional Children*, 43(2), 50–58.

Rojo, M., Nozari, M., & Bryant, D. P. (2022). Systematic progress monitoring of individualized education program goals in mathematics. *Intervention in School and Clinic*, 57(5), 322–328.

Smilkstein, R. P. (1993). The natural human learning process. *Journal of Developmental Education*, 17(2), 2–10. <http://www.jstor.org/stable/42774599>

Vanderbilt, A. A. (2005). Designed for teachers: how to implement self-monitoring in the classroom. *Beyond Behavior*, 15(1), 21–24. <http://www.jstor.org/stable/24011436>

Wells, J. C., Sheehey, P. H., & Sheehey, M. (2017). Using self-monitoring of performance with self-graphing to increase academic productivity in math. *Beyond Behavior*, 26(2), 57–65.

<https://www.jstor.org/stable/26866787>

Zimmerman, B. J. (2002). Becoming a self-regulated learner: an overview. *Theory into Practice*, 41(2), 64–72.