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AN EVALUATION OF STUDENT-LED DATA NOTEBOOKS

By

DESIREE M. THOMPSON

A doctoral dissertation submitted to the
College of Education
in partial fulfillment of the requirements
for the degree Doctor of Education
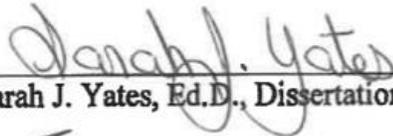in Curriculum and Instruction

Southeastern University
November, 2021

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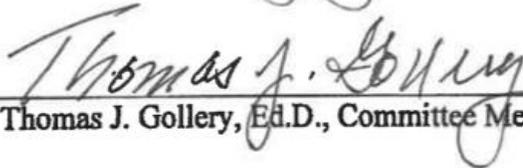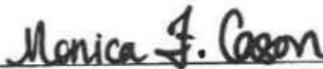DESIREE M. THOMPSON

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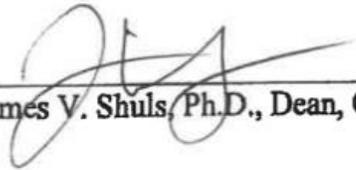
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DEDICATION

My doctoral journey is dedicated to my family. First, my husband Jamie, who never let me quit. Jamie never stopped believing in me, and always knew exactly what to say when I wanted to give up. He sacrificed so much for me. His selfless love throughout this journey is something I will never forget. Jamie, I love you always. Thank you for believing in me and loving me more than I deserve.

In addition, I want to dedicate this work to my three children, Grace, Prestyn, and Jaxx. They have sacrificed so much for their mommy to finish. They are my reason. I hope they will one day realize this work is because of them. Mommy loves you always.

ACKNOWLEDGMENTS

Thank you, Dr. Yates, for always believing in me. My journey has not been easy, but you continued to give me the gentle push I needed to complete my dissertation. You did not allow my setbacks to defy me. It has been wonderful learning from you, and something I will never forget.

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Thank you, Cohort G, for your continued love and support. You all are an amazing group, and I would not have made it without you.

And last but certainly not least, thank you, Dr. Monica Cason. It was an honor to work with you throughout my doctoral journey. When we first began this process, I would have never guessed our working relationship would have grown into such a beautiful friendship. God's timing is impeccable. You are amazing, sweet friend.

Abstract

The purpose of this study was to examine teachers' perceptions of data notebooks after

implementation in an elementary school in Northeast Florida. This quantitative study was

founded on the goal-setting theory, which focuses on setting attainable goals for motivation. The

research participants were 45 teachers from a K-5 school. The participants varied in grade level

and experience. Data were collected via a survey after teachers had fully implemented data

notebooks in the classroom. Understanding teachers' perceptions of data notebooks will

encourage school leaders to implement data notebooks to strengthen student accountability,

student motivation, and the instructional process in the classroom.

Keywords: data notebooks, goal setting, progress monitoring assessments, first-hand data

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I. INTRODUCTION

When teachers create a positive classroom experience, the students will want to thrive (Willans & Williams, 2018). Educators have researched different methods to increase student motivation and student success in the classroom for decades (Gilbert, Musu-Gillette, Woolley, Karabenick, Strutchens, & Martin, 2014; Pantziara & Philippou, 2015). The students in today's classrooms have different learning preferences, needs, and goals than in previous generations (Taylor & Parsons, 2011). Therefore, teachers are moving away from cookie-cutter lessons and focusing more on the individual student's strengths and weaknesses to make the learning more meaningful for each student (Kaur, 2017).

Teachers and administrators have been tasked with improving student outcomes through collecting and analyzing student data (Jimerson, Cho, Scroggins, Balial, & Robinson, 2019). Within the last decade, a new practice has emerged in which teachers task the student with tracking and analyzing personal data (Jimerson et al., 2019). The teacher, subsequently, takes on a new role to provide feedback and to facilitate the learning for each student (Jimerson et al., 2019). The student uses a data notebook to set goals, monitor data such as weekly test scores or quarterly reading levels, and make learning adjustments. The use of data notebooks, which are derived from Stephen Covey's (2008) *The Leader in Me*, enables students to focus on their individual strengths, to demonstrate leadership, and to take ownership of their learning (Covey, 2008).

Background of the Study

Teachers, administrators, and parents hold high expectations of students to demonstrate success in multiple areas of their academic life. For example, Muenks, Wigfield, and Eccles (2018) explained how the expectations of parents and teachers influence the motivation a child has for themselves. Researchers have acknowledged that teachers could strengthen student motivation by using specific instructional strategies (Wehmeyer, Shogren, Toste, & Mahal, 2017). For example, teachers can instruct students on how to self-monitor, self-evaluate, and set goals (Wehmeyer et al., 2017). Another component of successful academic performance is the teacher's ability to make the content relevant and meaningful to the student (Albrecht & Karabenick, 2018). An increase in academic motivation occurs when students can make meaningful connections between what they do in school and its relationship to the students' everyday lives (Albrecht & Karabenick, 2018).

Educators are tasked with motivating students to perform well academically. In response to the accountability policies of the United States, schools are implementing various assessments—formative, summative, and benchmark testing—to monitor students' progress throughout the school year (Abrams, McMillan, & Wetzel, 2015). Assessment data helps educators drive instruction. However, if students do not put forth effort on progress monitoring assessments, the data will be inaccurate. Some students have an intrinsic motivator, but educators cannot count on the intrinsic motivation to be the only motivating factor (Stephens, 2015).

Goal setting involves the process of setting a specific, measurable learning target (Moeller, Theiler, & Wu, 2012). According to Ray, Onifade, and Davis (2019), setting personal goals, reflecting on the learning goals, and adjusting the learning goals are beneficial for students. Moeller et al. (2012) performed a five-year quasi-experimental study examining goal

setting and student achievement in a sample of 1,273 high school students. The findings revealed a statistically significant relationship between goal setting and achievement ($p < .01$; Moeller et al., 2012). In a later study, Froiland (2018) examined instrinsic learning goals set by elementary students and found that students were more motivated when learning goals were applied in the classroom. Froiland's (2018) data also revealed that when students set and achieved goals, the students had fun learning.

One way that teachers can monitor student growth and progress is by tracking student data and providing feedback. For example, Slezak, Underwood, and Moreno (2019) conducted a seven-month case study to examine the effectiveness on learning after implementing data notebooks. The study was conducted in four ninth-grade, physical science classrooms. Students used the data notebooks daily to write what they understood or did not understand about the lesson taught. Teachers would then use the data notebooks as a tool for understanding their students' thought processes. Teachers did not provide any feedback to students after their writing entry. The results indicated that data notebooks were insignificant. The researcher suggested a design in which teachers provide feedback to students (Slezak et al., 2019).

In 2019, Lee, Mak, and Yuan performed a qualitative study to examine the benefits and setbacks of data notebooks in a writing classroom (2019). The researchers conducted the study in two classrooms at two different schools in Hong Kong. Teachers attended a three-hour workshop that helped the teachers understand what data notebooks were and how to implement them. After the training, teachers taught students how to set learning goals, how to take ownership in their own learning, and how to self-reflect. Also, teachers had the responsibility of providing the students with feedback. The researchers gathered data through pre- and post-interviews with students and teachers and also performed classroom observations. Lee et al. (2019) found that the

implementation of data notebooks was beneficial for student confidence, student ownership in learning, and teacher growth. Lee et al. (2019) also found some setbacks to implementing data notebooks. Teachers spent much of their time teaching students how to set goals and providing feedback; therefore, teachers did not have enough time for students to self-reflect (Lee, et al., 2019).

Cimer (2011) performed a qualitative study to research student teachers' views of data notebooks. The participants, members of a teacher preparation program, were taking an assessment and evaluation course. In the study, student teachers tracked their personal weekly test in a data-notebook (Cimer, 2011). The university professor gave immediate feedback and asked the student teachers to write a reflection following the feedback. The results indicated that students in the teacher preparation program who used data notebooks had an increase in motivation and retention (Cimer, 2011). Cimer recommended using data notebooks as a learning tool to allow self-reflection and to give continuous and immediate feedback.

Problem Statement

Researchers of previous studies on data notebooks have focused on the benefits and drawback of data notebooks. However, more research is needed on teachers' perceptions of data notebooks after implementation.

Purpose Statement

The purpose of this quantitative study was to determine teachers' perceptions of how the implementation of data notebooks impacted students at an elementary school in Northeast Florida.

Research Questions

This study addressed the following research questions:

1. To what extent do teachers perceive data notebooks contribute to student accountability in the classroom?

2. To what extent do teachers perceive data notebooks contribute to academic motivation in the classroom?

3. To what extent do teachers perceive data notebooks as an integral component of the instructional process?

Theoretical Framework

This study's theoretical foundation was derived from research on the goal setting theory, which is derived from Edwin Locke. Locke (1968) found that the goals of individuals determine their actions. For a person to commit to personal goals, the person must believe his personal goals are attainable (Locke, Latham, & Erez., 1988). According to the goal-setting theory, personal goals might have a positive impact on student achievement in the classroom (Burns, Martin, & Evans, 2019).

Latham and Locke (2006) identified task complexity, commitment to a goal, and feedback as goal setting facilitators. Latham and Locke explained that task complexity is when a person understands what the goal is and that the goal is reachable. The importance of the goal to a person determines the commitment to a goal. If a person feels the goal is not reachable or not meaningful, the person considers the goal not important. Feedback is needed to track and reflect on progress. Reflection helps a person stay on track and change factors that prevent that person from reaching the set goal (Latham & Locke, 2006).

Researchers DeMink-Carthew, Olofson, LeGeros, Netcoh, and Hennessey (2017) studied the goal-setting approaches of middle school classrooms that implemented a personalized learning environment centered around students having a choice in what they are learning, how

they learn the content, and how they demonstrate the learning. DeMink-Carthew et al. (2017) tested multiple approaches to the goal-setting theory. Their findings indicated that the most success occurs when students are responsible for developing their own goals and receive feedback on the goals from the teacher. Setting goals combined with collaboration between the student and teacher helps students take responsibility for their own learning and develop an understanding of skills through different lenses (DeMink-Carthew et al., 2017). This study explored if the implementation of data notebooks contributed to teachers' perceptions of student accountability, academic motivation, and the overall instructional process.

Overview of Methodology

The sample school was a Title I school in a rural community with approximately 750 students, ranging from pre-K through fifth grade, enrolled. The racial make up was 75% White, 10% African American, 8% Hispanic, and 7% other. The sample school was in the second year of implementing data notebooks in approximately 60 classrooms and each grade level had a variation of the data notebook that fit the students' cognitive abilities. . The teachers differed in experience, expertise, and grade level.

Research Hypotheses

When addressing the stated research problem, the following research hypotheses were considered:

1. To what extent do teachers perceive data notebooks contribute to student accountability in the classroom?

   $H_0 1$: There will be no statistically significant degree of perceived contribution on student accountability pertaining to the use of data notebooks.

2. To what extent do teachers perceive data notebooks contribute to academic motivation in the classroom?

$H_0 2$: There will be no statistically significant contribution to perceived student motivation in the classroom by using data notebooks.

3. To what extent do teachers perceive data notebooks as an integral component of the instructional process?

$H_0 3$: There will be no statistically significant contribution to the instructional process by using data notebooks.

The researcher obtained institutional review board appoval through the sponsoring university as well as the school district's institutional review board. A pilot survey was conducted via social networking using teachers who had already implemented data notebooks. The pilot survey was conducted using approximately 20 participants for instrument validation purposes. The piloted version of the instrument was analyzed using the Cronbach's alpha statistical technique for validation purposes prior to the actual administration of the instrument to the participant sample.

Following the piloted survey, sixty teachers from the sample school were invited via email to voluntarily participate in the survey instrument using Survey Monkey. The survey was administered after data notebooks had been implemented to evaluate the perceptions that teachers had regarding data notebooks' impact on student accountability, student motivation, and the instructional process. Teachers who participated in the survey were given a "jeans pass"—a pass to wear jeans on any day of the week. The researcher left the jeans passes in a central location. Once teachers completed the survey, teachers were advised to take one jeans pass. The names of participants were not collected in order to protect the identity of the participants.

The study is considered a non-experimental research design. The variables of the study have not been changed or construed (Price, Jhangiani, & Chiang, 2015). The participants of the study worked in their normal classroom environment and pulled the data directly from the work that had already taken place in the classroom. The study's research instrument was a researcher-created survey constructed to measure teachers' perceptions of data notebooks' contribution to student accountability, student motivation, and the instructional process.

The study participants were teachers from the sample school who had fully implemented data notebooks. Approximately 30 primary grade teachers and 30 intermediate grade teachers were employed at the site. The teachers varied in experience, expertise, and grade level. Teachers were asked to participate in a survey that was available via Survey Monkey. The survey was anonymous, so the identity of each participant was protected.

<div align="center">**Analysis**</div>

Preliminary Analysis

Prior to the analysis of research questions posed in the study, preliminary analyses involving missing data, consistency of participant response, and demographic information were conducted. Missing data was analyzed using descriptive and inferential statistical techniques. Frequency counts (*f*) and percentages (%) will be included for illustrative purposes. The randomness of missing data was assessed using Little's MCAR test statistic. An MCAR value of $p > .05$ was considered indicative of sufficient randomness of missing data.

Internal reliability of participant responses to the survey instrument was assessed using Cronbach's alpha (α)*.* The statistical significance of α was evaluated through the application of an *F* tes*t. F* values of $p < .05$ are considered statistically significant.

Sample Size/Power Analysis

An a priori power analysis using G*Power was implemented to assess prospective study sample size needed to detect an effect for the intervention variable. If the treatment effect is large ($d = .80$), a sample of 12 will be sufficient. For a medium treatment effect ($d = .50$), a sample of 27 will suffice, and if the magnitude of treatment effect in the study is small ($d = .20$), the study's anticipated sample size of 40 will be sufficient to detect significance of finding with both a medium and large treatment effect. If the effect of the treatment is as low as $d = .31$, the study's sample will be sufficient to detect a significant finding.

Analyses by Research Question

The study's three research questions were addressed using descriptive and inferential statistical techniques. SPSS (Statistical Package for the Social Sciences) was used to conduct the test for normality, significance, effect size, and internal consistency. In all research questions, the *t* test of independent means represented the primary inferential technique used.

The alpha or probability level of $p < .05$ represented the threshold for statistical significance of findings. The Cohen's *d* statistical technique was used to assess the magnitude of effect size in each of the three research questions. Cohen's conventions were applied to all *d* values for qualitative interpretive purposes. A one sample *t* test was conducted to compare the respondents' mean scores to 3.0 in the categories of student accountability and student motivation. A Shapiro-Wilk test was conducted to test the assumption of normality.

Significance of the Study

For educators, the outcome of student success is an important aspect of a child's education. Addressing the need for student accountability and student motivation is critical for student success. Data from the study provided educators with information regarding teachers'

perceptions about whether data notebooks assist students in developing accountability and motivation; as well as if teachers perceive data notebooks to be an integral part of the instructional process.

Limitations

The following limitations to this study existed: the data collected was confined to one school within one school district; therefore, the results may not be generalizable to other schools. In addition, the researcher cannot be sure each participant implemented data notebooks with fidelity.

Definition of Key Terms

The following words and phrases are key terms for the study:

- **data notebooks**: notebooks used for students to set goals and track progress towards goals (Covey, 2008)

- **goal setting**: a process in which students set a specific, measurable learning target (Moeller, Theiler, & Wu., 2012)

- **progress monitoring assessments**: assessments used to monitor students' academic performance, as well as to evaluate instruction (Center on Response to Intervention at American Institutes for Research, n.d)

- **first-hand data:** data collected by students through their own scientific inquiry (Hug & McNeill, 2008)

Summary

The purpose of this quantitative study was to determine teachers' perceptions of how the implementation of data notebooks impacted student accountability, student motivation, and the instructional process. By surveying teachers who had implemented data notebooks, valuable

information regarding student motivation and student accountability was gained. This

information will be useful for in schools as educators seek ways to improve student success.

II. Review of Literature

The purpose of this quantitative study was to determine how teachers perceive the implementation of data notebooks and how data notebooks impacted students at an elementary school in Northeast Florida. The study used the goal-setting theory as a lens to examine how teachers perceive data notebooks impact student accountability, student motivation, and the instructional process. The literature review will discuss the following topics: student motivation, goal setting, and student accountability.

Student Motivation

In 2018, researchers Trajkovik, Malinovski, Vasileva-Stojanovska, and Vasileva studied the implementation of games in elementary classrooms. The study focused on the students' personality traits and motivation, intrinsic and extrinsic motivation, student performance, student experience, and personality traits with the implementation of traditional games (Trajkovik et al., 2018). The researchers defined traditional games as games played over generations, such as hopscotch or hide and seek. The study took place in five elementary schools with a total of 102 participants. The participants were students broken into two groups; 53% were students ages 7-8, and 40% of the students were ages 11-12 (Trajkovik et al., 2018). Traditional board games were introduced to the students and implemented during six learning sessions. After playing the traditional board games, teachers evaluated the students on a scale of one (*poor*) to five (*excellent*) based on the performance of learning outcomes (Trajkovik et al., 2018). Questionnaires were given to teachers to assess the students' personalities and motivation after playing the games (Trajkovik et al., 2018). Trajkovik et al.'s (2018) results indicated implementing games in the classroom increased learning outcomes through student motivation ($\beta = 0.78$, $p < 0.001$) and student experience ($\beta = 0.29$, $p < 0.001$). These results suggest that when

there is an increase in motivation, there is an increase in learning outcomes (Trajkovik et al., 2018). Traikovik et al.'s (2018) study also suggest students were eager to play traditional learning games, which then motivated the students to learn. The researchers used traditional learning games to make the learning fun and engaging, and educators are also challenged to find motivation factors in the classroom to increase academic performance.

In 2020, researchers Kotaman and Aslan examined the motivation factor for 1,184 students in pre-school to eighth grade. With consultation from the teachers, the researchers developed mathematical, standards-based questions for the students to answer. When a student gave a correct response, the student had three choices: praise from the teacher in front of their classmates, a tangible reward, or a more challenging question (Kotaman & Aslan, 2020).

The study results indicated that as the students increased in age, the desire for a tangible reward increased and a social reward decreased. The likelihood of a tangible reward serving as motivation increased with age ($\beta = 0.980$, $p < .000$). At a young age, the tangible reward was a lollipop, but in eighth grade, the tangible reward was a soccer ball or a diary (Kotaman & Aslan, 2019). As students increased in age, the researchers found the desire for a more challenging question increased ($\beta = 1.022$, $p < .000$). After students chose a social reward, a tangible reward, or a challenge, the students were asked why they had chosen that type of reward. The students' responses were broken into categories: personal desires, avoidance of attention, social recognition, a gain in confidence, a sense of accomplishment, or approval from family. When students were asked why they wanted a more challenging question over a tangible reward, they mentioned enjoyment for an accomplishment, and said things like "I felt smart when I solved the question" (Kotaman & Aslan, 2019, para. 29). Students also expressed their desire for approval: "My mom appreciates me when I solve difficult questions" (Kotaman & Aslan, 2019, para. 29).

The results indicated that when students are successful with a task, students feel a sense of self-confidence. This self-confidence builds intrinsic motivation to continue thriving academically.

Over five weeks, 402 ninth and tenth graders participated in a research study that focused on student motivation and student performance (Lin-Siegler, Chen, Fang, & Luna-Lucero, 2016). The researchers performed a randomized field experiment during the high school students' science class, which began by administering a pretest to the students. The pretest was a short survey that focused on the students' thoughts regarding intelligence, goal orientation, effort, and failure. After the pretest, students were randomly put into groups that focused on either the intellectual struggle stories, life struggle stories, or achievement stories of three scientists (Einstein, Curie, and Faraday). The intellectual group read about three who struggled during their scientific discoveries. Students grouped into the life struggles group read about the same three scientists, but the stories focused on personal issues such as poverty. The students grouped into the achievement stories group read about the same three scientists but only read about the scientists' successes. After six weeks, the researchers administered a post-test, focusing on the same elements as the pretest: intelligence, goal orientation, effort, and failure (Lin-Siegler et al., 2016).

The researchers measured the effect reading the stories had on the students' science grades, which was calculated as an average of the students' homework, projects, tests, and quizzes. The science grades were standardized into z scores (Lin-Siegler et al., 2016). The results of the 6-week study revealed when students read about the success of scientists, the overall science grade decreased ($M = .08$, $SD = 1.02$) when compared to students who read about intellectual struggles ($M = .12$, $SD = .81$), $t(398) = 2.28$, $p = .02$, $d = .04$. The overall science grade also decreased when compared to life struggles, ($M = 17$, $SD = .90$), $t(398) = 2.04$, $p = 04$,

d = .05 (Lin-Siegler et al., 2016). Students who performed low on the pretest and read about the scientists' struggles had a higher post-intervention score than those who read about the scientists' achievements, *t*(398) = 3.52, *p* =. 001 (Lin-Siegler et al., 2016). The findings indicated students were able to make a connection to the struggling scientists and that reading about scientists' ability to overcome barriers and succeed motivated the students.

Scales, Boekel, Pekel, Syvertsen, and Roehlkepartain (2020) examined the relationship between teachers and students and its effect on motivation and student performance. The study took place at a middle school in the midwestern United States. The 534 participants were in sixth, seventh, and eighth grades. Students were asked to take an 81-question survey at the beginning of the school year (October) and again at the end of the school year (May). The surveys focused on student-teacher relationships, academic motivation, sense of belonging, school climate, and socioeconomic status (Scales et al., 2020). The results of the survey indicated students with low socioeconomic status had lower academic motivation (β = -.22, *p* < .001) and weaker relationships with their teachers compared to students who were not financially strained (β = -.17, *p* < .001; Scales et al., 2020). The survey also indicated students who developed a stronger relationship with their teacher for one school year felt a more positive perception of school climate and academic motivation (Scales et al., 2020). Students who had stronger relationships with their teachers also had more motivation and higher GPAs than students who did not have a strong teacher relationship (Scales et al., 2020). The teacher-relationship was not the contributing factor to a higher GPA, however; rather, the teacher relationship contributed to the greater sense of motivation (Scales et al., 2020). The findings revealed relationships between students and teachers increased motivation, and motivation then increased grades (Scales et al., 2020).

Goal Setting

The goal-setting theory suggests a positive correlation between setting goals and academic achievement (Sides & Cuevas, 2020). Sides and Cuevas (2020) stated that learning how to set goals is essential for elementary-aged students and will boost student confidence and student motivation . Sides and Cuevas (2020) performed a quasi-experimental study to examine goal setting's influence on motivation, self-efficacy, and math achievement. The participants were 70 third- and fourth-grade students at an elementary school in Georgia.

The researchers created data tracking folders for each participant in the experimental group, including a goal sheet, a self-tracking graph, and a self-reflection page. Teachers assisted participants with setting goals related to mastery of multiplication facts (Sides & Cuevas, 2020). Twice a week for 8 weeks, participants in the experimental group completed a 5-minute multiplication quiz and recorded their results on the graphing sheet. After graphing the quiz results, participants conferenced with their teacher regarding strategies to use, such as first completing the multiplication facts that are known. The experimental group would self-reflect on the self-reflection page located in the participants' data tracking folders once a week. The participants would write about the strategies that worked and did not work and reflect on their progress towards meeting their goals (Sides & Cuevas, 2020). The participants in the control group completed the 5-minute timed multiplication quiz and verbal encouragement from their teacher. However, the control group did not receive personalized folders or time for self-reflection (Sides & Cuevas, 2020). Following the 8-week intervention of goal-tracking with the experimental group, a post-test was given to both groups.

The study results indicated no significant difference ($M = .08$, $SD = 1.02$) between the experimental and comparison groups when testing goal setting and student motivation and there

was no statistically significant impact ($M = .08$, $SD = 1.02$) on self-efficacy when goal setting (Sides & Cuevas, 2020). When the researchers compared goal setting and student achievement, there was a statistically significant difference ($F(1, 67) = 45.17$, $p < .00$). Sides and Cuevas's (2020) study contributed to research that goal setting increases student achievement.

Froiland and Worrell (2016) also examined learning goals and student achievement on 1,575 high school students. The high school's leadership team sent the students a survey every fall to make informed decisions regarding motivation, school climate, and achievement. The survey was not a requirement for students. Therefore, only 49% of the high school students participated in the online survey. The survey focused on students' intrinsic motivation, learning goals, engagement, demographics, academic achievement, and parents' education (Froiland & Worrell, 2016). The findings revealed intrinsic motivation was positively correlated with GPA ($p < .005$). In addition, the findings disclosed student engagement and learning goals correlated with greater academic achievement ($p < .05$). The researchers suggested students benefited when there was an environment that encourages intrinsic motivation (Froiland & Worrell, 2016).

DeMink-Carthew, Olofson, LeGeros, Netoch, and Hennessey (2017) examined goal-setting theory in personalized learning environments with 11 teachers in grades 4-8. Researchers sought to answer how the teachers approach the goal-setting theory and how the goals correlate with a personalized learning environment (DeMink-Carthew et al., 2017). Each of the participants had engaged in goal setting during the previous school year. The researchers interviewed each participant to determine the teachers' background knowledge and experience with goal setting. After the interview, the teachers were asked to complete a task sheet and rank components of the goal-setting process (DeMink-Carthew et al., 2017). The researchers

performed a qualitative analysis of the task sheet and interviews and identified five approaches to goal setting.

The first approach was the independent approach, which occurred when the teacher spent time teaching the students how to set goals and then students developed their own academic goals without knowing the content (DeMink-Carthew et al., 2017). The independent approach gives students a voice when setting a goal. However, a disconnect exists in the learning experience: the students could not make choices regarding what was learned, so the student involvement stopped after setting the goal. The disconnect between student goals and learning resulted in little to no engagement from the students.

The second approach was interest-driven co-design, which focused on students' interests. Students were introduced to specific, measurable, attainable, relevant, and time-bound (SMART) goals and asked to set SMART goals based on their interests. The teacher gave students feedback based on the students' goals and then applied the goals to the students' learning experiences (DeMink-Carthew et al., 2017).

The third approach, the interest and skill-driven co-design, is similar to the interest-driven co-design except the teacher and the student work together to redefine goals (DeMink-Carthew et al., 2017). The interest and skill-driven co-design focuses more on matching the learning to the students' goals. The skill-driven co-design began with the teacher introducing the skills for the year and the students basing their goals on the skills needed (DeMink-Carthew et al., 2017). In the backward approach, the teacher taught SMART goals and gave feedback. The skill-driven co-design approach is difficult for students to connect with since it was difficult to make goals based on unfamiliar content (DeMink-Carthew et al., 2017).

The last approach is the selection approach in which the teacher wrote the goal statements based on the skills needed to be taught, introduced the students' skills, and then the students picked a goal. The selection approach is more teacher-driven rather than student-driven (DeMink-Carthew et al., 2017).

The results of the study identified multiple approaches to goal setting. Each approach noted the importance of empowering the learner to take ownership of academic goals (DeMink-Carthew et al., 2017). The researchers recommended more research on teachers and the challenges teachers face with goal setting and also networking for teachers to determine the best practices for goal setting (DeMink-Carthew et. al, 2017).

Researchers Pounds and Cuevas (2019) performed a study that focused on students' involvement in their Individual Education Plans (IEP) and setting personal goals. The participants considered were 23 students in an elementary school, grades kindergarten through fifth grade. The students were taught what IEPs stood for and how to read their IEPs. Each of the students had a student portfolio that contained student IEP goals, the students' data that reflected progress, and samples of work (Pounds & Cuevas, 2019). Pounds and Cuevas (2019) believed students could become self-advocates and make their own learning goals when they actively participated in writing their own IEP. Before the students' IEP meeting, each student met with their special education teacher once a week for 4 weeks. Each session lasted for 20 minutes to discuss the student's goals and what progress the student was making. During the meeting, the special education teacher reviewed the student's portfolio. At their annual review meeting, the students presented their progress using a PowerPoint, poster, or another presentation form. The students were responsible for sharing their strengths, weaknesses, mastery of goals, and recommendations of new goals moving for the upcoming school year. The special education

teacher used a rubric from Learn with Two Rivers, a high-performing public charter school in Washington, D.C. (Pounds & Cuevas, 2019). The students were able to discuss their strengths and weaknesses, but they did not have the ability to discuss their IEP goals. Because the students lacked the background knowledge, the researchers recommended students in grades K-5 would benefit from beginning goal setting at an early age (Pounds & Cuevas, 2019).

Researchers Koenig, Eckert, and Hier (2016) examined the effectiveness of performance feedback to improve writing when goal-setting interventions were put into place. Participants in the study were 115 third-grade students. The study lasted for 8 weeks and was broken up into three phases: eligibility, baseline, and intervention (Koenig et al., 2016).

The students were randomly assigned to the control group or one of three conditions: performance feedback, performance feedback combined with goal setting, and a control group (Koenig et al., 2016). The first condition, performance feedback, examined the correct writing sequence. First, students wrote a narrative. Then, students assigned to performance feedback received both written and oral feedback. After the eight sessions, students assigned to performance feedback averaged 2.47 correct writing sequence compared to the students assigned to the control group, which averaged 0.81 correct writing sequence (Koenig et al., 2019). The first condition revealed statistically significant differences, $t(56) = 4.0$, $p < .001$, $d = 0.78$ (Koenig et al., 2019).

The second condition compared student growth with goal setting and feedback (Koenig et al., 2019). The students assigned to performance feedback and the goal-setting condition were given a writing probe that asked them to respond to a narrative prompt and a fluency goal. After students completed the writing passage, the students received written and oral feedback. Students would then count the number of words they wrote, record this number, and then graph the

number (Koenig et al., 2019). Students assigned to goal setting and feedback averaged 2.24 correct writing sequences compared to the students assigned to the control group, which averaged 0.82 correct writing sequences (Koenig et al., 2019). The researchers concluded that students' writing improved with goal setting and feedback (Koenig et al., 2019).

In 2020, researchers Didion, Toste, and Benz studied a goal-setting program on 12 third grade students. The researchers sought to determine if implementing the Data Mountain program would increase the participants' oral reading fluency performance (Didion et al., 2020). Data Mountain is a program that teaches students how to set goals and self-monitor their progress (Didion et al., 2020). The study was designed using two case studies: a pilot study and a replication study one year later (Didion et al., 2020).

During the pilot study, the students participated in one training session that taught the students how to display data using lines and data points and interpret the data (Didion et al., 2020). The students read an oral reading fluency passage and focused on words read per minute (Didion et al., 2020). Following the initial read, students set a new goal each time they read the fluency passage (Didion et al., 2020). Once the student read the passage, the student and interventionist would conference. The student and interventionist discussed the results, if the goal was met, and set a new goal (Didion et al., 2020). After the fifth session, students received motivational training. Before reading, the interventionist gave the students a pictured 5-point scale to indicate how they felt that day (Didion et al., 2020). Throughout the sessions, the interventionist discussed challenging scenarios with the student. They discussed overcoming negative thoughts and being confident (Didion et al., 2020). All sessions were audio recorded to observe behaviors. A score was given based on the number of observed behaviors divided by the

total number of items from a 31-point checklist (Didion et al., 2020). The mean score was 99%, with a standard deviation of 2.35 (Didion et al., 2020).

The replication study combined the self-monitoring and goal setting into one program (Didion et al., 2020). Students attended the self-monitoring training session and then moved right into using Data Mountain (Didion et al., 2020). Students in the replication study were able to connect positive thoughts to reading strategies quicker. The results of the replication study indicated combining goal-setting and self-monitoring at the same time creates an improvement in student performance.

Wilburne and Dause (2017) studied nine struggling students in a fourth-grade mathematics classroom. The study focused on goal-setting and self-regulated learning on instruction. The participants were taught self-regulation strategies three times a week for 5 weeks. The self-monitoring strategies of "What do I need to do? What am I doing at this step? Why am I doing it? How is it helping me?" were modeled by the instructor. Over 5 weeks, a gradual release process took place: teacher-led, then student-led, followed by group work, and finally independent practice, shifting the instructor's focus to the student. Students were also asked to set goals before beginning each problem and then assess their goal after solving the problem. The researcher saw an increase in the number of goals the students set for themselves. The students' goals increased from an average of 2.25 to an average of 3.22. As the students received more self-regulation instruction, students set higher goals. One of the goals taught to the students involved solving the problem using multiple strategies. After five weeks, the researcher observed students attempting more than one strategy (Wilburne & Dause, 2017). The study reveals students who are taught to set goals continue to strive for greater academic performance.

Keus and Haave (2020) created learning philosophy assignments that allowed college students in a biology class to consider students' learning goals and document their metacognition. The learning philosophy assignments were designed to examine patterns between metacognitive knowledge and self-regulation in a college biology class (Keus & Haave, 2020). Students were given feedback on each learning philosophy assignment. The feedback given on each student's response recommended various learning strategies and explained why the learning strategy should be implemented (Keus & Have, 2020). The learning philosophy assignments were coded and examined for metacognition, goal setting, and self-regulation themes. The researchers found it difficult to code metacognition and self-regulation separately. For example, one participant stated, "I have had to drastically change my learning habits following the midterm to make sure I am addressing course content daily to understand things as a whole better" (Keus & Haave, 2020, p. 12). The researchers decided to code statements that overlapped under metacognition. The results indicated all students showed evidence of metacognition. The results also indicated most students focused on their learning strategies and self-regulation (Keus & Haave, 2020). Keus and Haave's research suggested that students are capable of linking metacognition and learning goals, resulting in achievement.

Student Accountability

In 2019, Thibodeaux, Harapnuik, and Cummings examined the influence of learner choice, ownership, and voice through authentic learning environments. The researchers conducted a study with 73 participants taking an online master's course, Digital Learning and Leading. Participants were employed in educational institutions, corporate training programs, and non-profit programs (Thibodeaux et al., 2019).

Thibodeaux et al.'s (2019) study used both qualitative and quantitative research methods. A survey was sent out via email to collect the quantitative data. The researchers gathered qualitative data from discussion board comments in the digital learning and leading course and from open-ended questions from an online survey (Thibodeaux et al., 2019). The researchers used a Likert scale to measure the students' opinions regarding choice, ownership, voice, and authentic learning (Thibodeaux et al., 2019). The findings revealed 88.89% of the master's degree students felt they had student choice, 98.57% felt they were given student ownership, and 95.77% felt they had a say in their learning (Thibodeaux et al., 2019). When students were given a choice in their education, they took ownership of their learning (Thibodeaux et al., 2019). When master's level students had a say in their learning process, the researchers found that the students developed a sense of ownership and felt empowered in their learning (Thibodeaux et al., 2019).

Book logs, which consist of recording sheets for students to document books read and time spent reading, are one tool used in the classroom for student accountability (Klvacek, Monroe, Wilcox, Hall-Kenyon, & Morrison, 2017). A second-grade teacher utilized book logs while implementing a strategy called "Follow the Reader" or dyad reading. "Follow the Reader" involved students pairing up with one struggling reader and one proficient reader who could read with fluency and modeled good reading (Klvacek et al., 2017). The grouped pairs chose a book together or took turns selecting a text, but the book was based on the lead reader's independent reading level. The students would sit side by side with the book between each student, and the lead reader was to use their finger for tracking. The students were taught how to have discussions while reading books, focusing on story elements. Once students were finished reading, the pair were responsible for recording the title of the book in the book log. The teacher acknowledged

that requiring students to record their books read in their book log encouraged students to read more (Klvacek et al., 2017). The results of the follow the reader strategy increased both students' (lead and assistant) reading level (Klvacek et al., 2017). The study revealed student book logs held students accountable and, because the students were aware the teacher would check the book log, the students read more books.

Researchers Zafiropoulou and Darra (2019) sought to determine if digital data notebooks contributed to a student's overall performance. The researchers also sought to find out to what extent digital data notebooks contributed to improving students' academic performance. The sample consisted of 40 students, 20 boys and 20 girls between the ages of seven and eight. The students were divided into two sample groups: students in Group A used a digital data notebook, and students in Group B used a paper-based data notebook. Students used the data notebooks in a language arts class where they recorded their performance grade following a lesson. The researchers compared the average scores on the language arts performance grade from both groups. The results revealed a statistically significant difference between using a digital version of a data notebook and using a paper-based data notebook, p = .000 (Zafiropoulou & Darra, 2019). The researchers concluded students benefited from using a digital data notebook due to immediate feedback (Zafiropoulou & Darra, 2019). The teachers benefited from using a data notebook because the teacher had a record of each student's strengths and weaknesses in the assessed content.

Ritter, Morrison, and Sherman (2020) performed a research study to examine the effects of self-graphing and self-monitoring on early literacy skills. Three kindergarten students participated in the study. The study used K-Pals, a 20-week early literacy program that focused on phonemic awareness, letter-sound, and decoding (Ritter et al., 2020). Ritter et al. (2020)

wanted to increase the intensity of the reading intervention by incorporating self-monitoring and/or self-graphing. Researchers conducted a baseline reading assessment for each student at the beginning of the study and then picked students with the lowest number of sounds per minute, but with the highest inconsistency. After the baseline data was collected, participants were taught how to self-graph and self-monitor. During the self-monitoring phase, students were taught how to find the test score, draw a bar on the graph, and assess if the goal was met. During the self-monitoring phase, students were taught to review their previous score, discuss the goal for the day, graph the outcome, and self-evaluate (Ritter et al., 2020).

Students participated in K-Pals intervention program 3 times a week for 30 minutes in addition to self-graphing or self-monitoring. K-Pals consisted of reading strategies that targeted phonemic awareness (Ritter et al., 2020). After 8 weeks, researchers observed an increase in students sounds per minute when alternating self-graphing and self-monitoring. For example, at the beginning of the study, one student had an average sounds per minute at $M = 3.66$ and $SD = 2.89$ and by the end of the 8-week study, the average increased to $M = 29.5$ and $SD = 5.68$ (Ritter et al., 2020). The researchers concluded both self-graphing and self-monitoring resulted in an increase in words per minute. It was noted that self-graphing took half the time as self-monitoring. Classrooms where time restraint is an issue could benefit from implementing self-graphing.

Sheehy, Wells, and Rowe (2016) implemented self-monitoring and self-graphing to test mathematics improvement in a student with cerebral palsy. The research study took place in a public school with 400 students. The participant was a seven-year-old boy in first grade who was on a first-grade level in reading but performed below first grade in math. The participant struggled to stay on task during independent math practice and often needed redirection. The

purpose of the study was to examine self-monitoring combined with self-graphing on academic improvement of a first-grade student with cerebral palsy. The research design was a single subject reversal (Sheehey, Wells, & Rowe, 2016).

Sheehey et al.'s (2016) study was conducted in three phases. The first phase was conducted over four consecutive days to gather baseline data for the participant. During the first phase, the participant was given five minutes to complete 15 addition and subtraction problems. If the participant finished before five minutes, the participant was instructed to turn the worksheet over to indicate the worksheet was complete. After either the student finished or the five minutes had passed, the teacher collected the worksheet. Later, the teacher graded the participant's worksheet, giving one point for each problem correct, and graphed the number correct on a bar graph.

The second phase of Sheehey et al.'s (2016) study was a training phase, which occurred three times in one week. The participant was given a self-cueing device called a MotivAider. The self-cuing device would vibrate on the participant's desk to cue the student to continue working. During the training phase, the participant was again given a worksheet with 15 adding and subtraction problems and the self-cuing device was set to vibrate every 30 seconds. The participant was instructed to draw a line under the problem the participant was on when the device vibrated and to put a dot next to each problem completed when the vibration went off. The participant's worksheet was graded in front of the participant and directions for graphing the correct number of problems took place. The participant and teacher practiced the self-monitoring with the cueing device and self-graphing, and the teacher provided feedback after each practice session.

The final phases of the self-monitoring and self-graphing study involved the participant using the MotivAider for 30 second intervals and completing fifteen math problems. When the participant finished, the teacher graded the worksheet and wrote the number of correct math problems on the top. The participant would then graph the results. In addition, the teacher graphed the participant's progress.

The results of the study indicated the participant showed improvement in the number of problems completed in five minutes, as well as improvement in accuracy. The baseline data showed the number of completed math problems by the participant had a mean score of 37%. During the second phase, the number of completed math problems increased with a mean score of 87%. During the baseline phase, the number of problems completed correctly had a mean score of 17%, while the final phase increased the accuracy with a mean score of 80%. The teacher stated that the participant became more confident after the study, and began participating during math instruction (Sheehey et al., 2016). Sheehey et al.'s (2016) study sought to explore the improvement self-graphing and self-monitoring had on a participant during math instruction. Self-monitoring and self-graphing can help students who struggle in mathematics can build accuracy, accountability, and self-confidence in students.

Researchers Ennis, Lane, and Oakes's (2017) single-case design study supports self-monitoring and self-graphing. The study sought to answer three questions: can self-monitoring be implemented in the classroom by an elementary teacher with little research? Is there a relationship between self-monitoring and student engagement? And to what extent do teachers and students perceive self-monitoring as socially acceptable? The participants of the study were three fifth-grade students whose grade was lower than a C in reading. All three students had a

learning disability and received 50 minutes of instruction from a special education teacher. During the study, the special education teacher had a student intern that also provided instruction.

The baseline phase of the study consisted of the normal 50 minutes of reading instruction. The student teacher provided scaffolded instruction where students' behaviors were redirected. Before the self-monitoring intervention was introduced to the participants, the special education teacher and student teacher participated in a self-monitoring training. Then, the student teacher introduced the participants to a self-monitoring checklist. The participants were asked to monitor their working behavior, actively working, or not working, every two minutes for 40 minutes. The participants were also given a MotivAider, a vibrating tool that cued the participants to self-monitor. Participants who reached the weekly goal of 80% would receive 10 minutes of free time on Fridays. Students also received two points each day for honesty. After each 40-minute session, the student teacher would provide each participant with feedback.

During the initial phase, implementation fell below the goal of 80% with a $SD = 25.57$. When the implementation fell below 80%, the student teacher was given cues by the research team. During the final stage, implementation was 86.67% with a $SD = 6.88$. The first participant had a work completion baseline of $M = 85.41$ and an academic active engagement range between 5% and 50%. During the final phase, the first participant increased work completion to $B_2 = 91.07$ with the self-monitoring intervention and increased academic active engagement ranging from 30% to 80% (Ennis et al., 2017).

The second participant had a work completion baseline of $M = 89.58$ and the participant's academic active engagement ranged from 20% to 85%. During the final phase, the second participant increased work completion to $B_2 = 91.07$ and an academic active engagement range from 45% to 85%. The third participant had a high rate for work completion, $M = 77.08$ and an

academic active engagement range of 10% to 55.56%. During the final phase, the third

participant had a $B_2 = 91.07$ showing the participant's work completion increased with the

intervention. The third participant's academic active engagement increased with a range of 55%

to 83% (Ennis et al., 2017). Ennis et al.'s (2017) study indicated students who use self-

monitoring and self-tracking increased work completion and academic active engagement. The

study asked participants to monitor behavior in the classroom which led to an increase in student

accountability and academic performance.

Furthering the research, Xu, Wang, Lee, and Luke (2017) performed a changing criterion

single-subject design to examine the effects of goal setting and self-monitoring on a student with

autism. The participant was in first grade and attended a general education classroom for three

hours out of the day and individual therapy with an autism specialist for one hour out of the day.

The student was referred to the study due to lack of focus in the classroom and disruptive

behaviors (Xu et al., 2017).

The study was broken up into four phases: baseline, training, intervention, and follow-up.

The baseline phase of the study consisted of the researcher observing and documenting

engagement behavior from the participant in a language arts class. During the baseline phase of

the study, the participant displayed little academic engagement, $M = 10.6\%$ (Xu et al., 2017).

The self-monitoring and goal-setting training happened during the participant's individual

therapy. The therapist worked with the participant to create academic behavior goals. The agreed

upon target behaviors were as follows: I did not play with things, I sat on the chair nicely, I

looked at the teacher during instruction, and I did what the teacher said (Xu et al., 2017). During

the therapy sessions, the participant and the therapist role played to ensure the participant

understood what the goal of each behavior looked like. During the intervention phase, the

participant was instructed to record his behavior every minute for 30 minutes. The participant would record a plus sign if the expected behavior was displayed and a minus sign if not (Xu et al., 2017). The initial goal for the participant was 20% success rate. When the participant reached the desired goal three times in a row, the goal increased by 20% until 80% was reached (Xu et al., 2017). During the final phase of the study, the participant reached an active engagement of M = 76.7% (Xu et al., 2017). The results of the study suggest implementing self-monitoring and goal setting increase academic engagement. The results also suggest implementing self-monitoring and goal setting decrease disruptive behaviors.

Summary

The review of the literature explored student motivation, goal setting, and student accountability. Student motivation, a combination of intrinsic and extrinsic motivation, is an important factor for academic success. Goal setting, a way for students to visually see their progress and to hold themselves accountable for their own learning, is also an essential factor in student achievement.

III. METHODOLOGY

The purpose of this quantitative study was to determine teachers' perceptions of how the implementation of data notebooks impacted students at an elementary school in Northeast Florida. Three research questions and hypotheses were posed to address the study's topic. A non-experimental quantitative research design path was adopted to address the study's problem statement and purpose. The research methodological approach selected for study purposes was a closed structure survey by means of a 5-point Likert scale.

The study's sample of participants was accessed in a non-probability fashion, specifically using a convenient/purposive approach. Descriptive and inferential statistical techniques were used to analyze change, preliminary data, and the data achieved through the study's research questions. Chapter three contains a formal presentation of the study's essential elements: research design and methodology, sampling technique, statistical power analysis for sample size parameters, research instrumentation, study procedures, and data analyses.

Statement of Problem

Researchers of previous studies on data notebooks have focused on the benefits and drawbacks of data notebooks. However, more research is needed on the teachers' perceptions of how the implementation of data notebooks impact students.

Description of Methodology

The study was considered non-experimental and quantitative by research design featuring a survey research methodological approach (Edmonds & Kennedy, 2012). The variables of the study were neither changed nor interpreted through experimentation (Price, Jhangiani, & Chiang, 2015). Lichtman (2013) noted that the benefits of researcher detachment, the potential for generalization of finding, and replicability reinforce the use of the quantitative approach to researching as a very desirable, meaningful option in the research process. Furthermore, the selection of a survey research methodological approach offers the benefits of flexibility, generalizability, and the potential to generate data on the topic (Denscombe, 2010).

Context of the Study

The research in this study took place in a Title I school in Northeast Florida. The school was comprised of 750 students, ranging from kindergarten through fifth grade. The racial make-up was 75% White, 10% African American, 8% Hispanic, and 7% other. The same school was in the second year of implementing data notebooks in approximately 60 classrooms. The teachers differed in experience, expertise, and grade level. Each grade level had a variation of the data notebooks that fit the students' cognitive abilities.

Participants

The study's participant sample was accessed in a non-probability, convenient/purposive manner (Frankel, Wallen, & Hyun, 2019). Study participants at the research site selected for study participation were defined as elementary-level teachers who had fully implemented data notebooks. Study participants varied in experience, expertise, and grade level. Approximately 30 primary grade teachers and 30 intermediate grade teachers represented the study's accessible sample of participants.

Instrument

The study featured a researcher-created instrument, as no existing standardized research instrument specifically addressing the study's construct was available for use in the study. A 5-point, Likert-type survey was incorporated as the measurement scale in the study's research instrument. The use of a 5-point scale has been validated by Dillman, Smyth, and Christian (2014). They specifically proposed the use of survey items ranging from "*strongly agree*," "*agree*," "*uncertain*," "*disagree*," and "*strongly disagree*" (Dillman et al., 2014, p. 159). As Willits, Theodori, and Luloff (2016) noted, this format of scaling was part of Likert's original vision for scaling and continues to be used in most researcher circles involving survey researching.

Validity of the Survey. The instrument's validation was addressed through a three-step process. In the first step of the validation process, the data anticipated to be produced using the study's research instrument were addressed through a subjective, content validity judgment process presented by Boateng, Neilands, Frongillo, Melgar-Quinonez, and Young (2018). The process of using subject matter experts (SMEs) in the area of the study's construct provided the themes that represented the foundation of the survey items on the study's research instrument.

The second stage of the validation process of the research instrument was conducted through the administration of a pilot study version of the survey with 20 study participants. The Cronbach's alpha (α) statistical technique was used to evaluate the internal reliability of pilot study participant response to items on the survey. An alpha level of $\alpha = .60$ to $.70$ was sought for validation purposes in the pilot study stage of the research instrument validation process. The achieved level of internal reliability ($\alpha = .94$) of study participant response to items on the

research instrument far exceeded the anticipated thresholds, therefore providing validation for proceeding with the study using the study's research instrument.

Reliability of the Survey. In the third stage of research instrument validation, the Cronbach's alpha (α) statistical technique was used to assess the internal reliability of participant response to survey items once study data were collected and formally recorded. An alpha level of $\alpha \geq .80$ was desired for internal reliability and final instrument validation purposes.

Procedures

Prior to administering the survey, institutional review board (IRB) approval through the sponsoring university as well as the school district's institutional review board were secured. The research instrument was assembled and represented through the Survey Monkey platform. A pilot administration of the research instrument survey was conducted via social networking using teachers who had already implemented data notebooks. The pilot survey was conducted using 20 participants for instrument validation purposes. The piloted version of the instrument was analyzed using the Cronbach's alpha (α) statistical technique for statistical validation purposes prior to the actual administration of the instrument to the participant sample.

A closed structure, Likert-type survey instrument was administered to teachers at the research site selected for study purposes after data notebooks had been implemented to evaluate the perceptions that teachers have regarding data notebooks' impact on student accountability, student motivation, and the instructional process. Sixty teachers from the anticipated research site were invited via email to voluntarily participate in the survey. Teachers who participated in the survey were provided a "jeans pass" - a pass to wear jeans on any day of the week. Once teachers had completed the survey, teachers were then able to access one jeans pass.

Data Analysis

   Preliminary Analysis. Prior to the analysis of research questions posed in the study, preliminary analyses involving missing data, consistency of participant response, and demographic information were conducted. Missing data were analyzed using descriptive and inferential statistical techniques. Frequency counts (f) and percentages (%) were included for illustrative purposes. The randomness of missing data was assessed using Little's MCAR test statistic. An MCAR value of $p > .05$ was considered indicative of sufficient randomness of missing data. A threshold of 5% missing data was adopted as how decisions regarding data imputations might be considered (Shafer & Graham, 2002).

   Internal Reliabilty. Internal reliability of participant responses to the survey instrument was assessed using Cronbach's alpha (α) statistical technique. The statistical significance of α was evaluated through the application of an F test. F values of $p \leq .05$ were considered to be statistically significant. Value judgments regarding Cronbach's alpha (α) levels were made through the lens of the conventions offered by George and Mallery (2018).

Research Question 1

   To what extent do teachers perceive data notebooks contribute to student accountability in the classroom?

Research Question 2

   To what extent do teachers perceive data notebooks contribute to academic motivation in the classroom?

Research Question 3

   To what extent do teachers perceive data notebooks as an integral component of the instructional process?

The study's three research questions were addressed using descriptive and inferential statistical techniques. In research questions one and two, the one-sample t test represented the primary inferential technique that was used to address the statistical significance of finding. The probability level of $p \leq .05$ represented the threshold for statistical significance of findings. The Cohen's d statistical technique was used to assess the magnitude of effect size in research questions one and two. Sawilowsky's (2009) conventions were applied to all d values for qualitative interpretive purposes. The assumption of normality in the research questions was assessed through the interpretation of respective skew and kurtosis values. Skew values not exceeding -2.0/+2.0 and kurtosis values not exceeding -7.0/+7.0 were considered indicative of relative data normality (George & Mallery, 2018).

Summary

The analysis and reporting of study finding were conducted using version 27 of IBM's Statistical Package for the Social Sciences (SPSS). The results of the study are presented in Chapter Four.

IV. RESULTS

Chapter Four contains a report of the findings from the study. Three specific research questions and hypotheses were stated to address the study's problem statement. Descriptive and inferential statistical techniques were used to address both preliminary analyses and analyses associated with the study's research questions and hypotheses. Associative and predictive statistical techniques were used to address the follow-up, ancillary analysis. A total of 45 study participants comprised the study's sample. The analysis and reporting of study finding were accomplished using IBM's Statistical Package for the Social Sciences (SPSS).

Methods of Data Collection

Foundational analyses were conducted in a preliminary, segue fashion ahead of the analytics associated with the study's research questions and hypotheses. Evaluations of missing data/completion rate, internal reliability, and initial descriptive statistical findings were conducted using descriptive statistical techniques.

Missing Data/Survey Completion Rate

The study's essential data arrays reflected no missing data points, and therefore was considered 100% complete (405 of a possible 405 data points).

Internal Reliability

The internal reliability for study participant response across all surveys items of the research instrument was assessed using the Cronbach's alpha (α) statistical technique. As a result,

the internal reliability level achieved in the study (α = .93) was considered excellent considering the parameters offered by George and Mallery (2018) and Field (2018). Table 1 contains a summary of finding for the analysis of the internal reliability of study participant response to all items on the research instrument.

Table 1

Internal Reliability: All Items Represented on The Research Instrument

Analysis	No. of Items	α	Lower Bound	Upper Bound
Internal Reliability	9	0.93	0.90	0.95

Note. Lower and upper bounds of Cronbach's α were calculated using a 95% confidence interval.

Descriptive Statistical Analysis

Descriptive statistical analyses were conducted for illustrative and comparative purposes in advance of the analysis of research questions and hypotheses. Table 2 contains a summary of finding for the descriptive analyses associated with survey items on the study's research instrument.

Table 2

Descriptive Statistics: Survey Items

Classroom Element	M	SD	n	SE_M	Min	Max	Skewness	Kurtosis
Student Accountability	4.31	0.79	45	0.12	1.00	5.00	-1.71	4.88
Academic Goal Setting	4.33	0.71	45	0.11	2.00	5.00	-0.95	1.03
Progress Monitoring	4.36	0.77	45	0.12	1.00	5.00	-1.89	5.94
Academic Performance Ownership	4.11	0.96	45	0.14	2.00	5.00	-0.85	-0.24
Achievement Motivation	4.09	0.90	45	0.13	2.00	5.00	-0.93	0.29
Eagerness to Learn	3.69	0.95	45	0.14	2.00	5.00	-0.47	-0.64
Positive Reinforcement	4.24	0.65	45	0.10	2.00	5.00	-0.78	1.72
Academic Enthusiasm	3.89	0.91	45	0.14	2.00	5.00	-0.69	-0.15

Response Effect by Survey Item

Study participant response effect for each of the study's survey items was evaluated using

the Cohen's *d* statistical technique. The greatest response effect was exerted for study participant

perceptions of "The use of data notebooks has represented a source of positive reinforcement for

students when they move towards or reach their academic goals" ($d = 1.93$), an effect considered

approaching the threshold of a huge effect ($d \geq 2.00$).

Table 3 contains a summary of finding for study participant response effects within each

of the study's survey items.

Table 3

Study Participant Response Effect (d) by Survey Item

Classroom Element	n	d
Student Accountability	45	1.65[a]
Academic Goal Setting	45	1.89[a]
Progress Monitoring	45	1.75[a]
Academic Performance Ownership	45	1.16[b]
Achievement Motivation	45	1.21[a]
Eagerness to Learn	45	.73[b]

Note. The [a] refers to a very large effect. The [b] refers to a large effect

Data Analysis by Research Question

Two research questions were formally posed to address the study's research problem. The

probability level of $p \leq .05$ represented the threshold for a finding to be considered statistically

significant. Magnitudes of effect achieved within the study were interpreted using the

conventions proposed by Sawilowsky (2009).

Research Question 1

To what extent do teachers perceive data notebooks contribute to student accountability in the classroom?

A one sample t test statistical technique was used to assess the statistical significance of mean score finding of 4.31 ($SD = 0.79$) in research question one. As a result, the finding was statistically significant based on an alpha value ($t_{(44)} = 11.10$, $p < .001$), indicating the null hypothesis can be rejected. The magnitude of study participant response to the notion that data notebooks contribute to student accountability in the classroom was considered very large at $d = 1.65$. The assumption of data array normally was satisfied by virtue of the skew value of -1.71 was within the acceptable parameters of -2.0/+2.0, and the kurtosis value of 4.88 was within the acceptable parameters of -7.0/+7.0 offered by George and Mallery (2018). Table 4 contains a summary of findings for research question one.

Table 4

Summary of Finding: Perceptions of Data Notebooks Contributing to Student Accountability in the Classroom

Classroom Element	M	SD	μ	t	p	d
Student Accountability	4.31	0.79	3	11.10	< .001	1.65

Note. Degrees of Freedom for the t-statistic $= 44$. d represents Cohen's d.

$H_0 1$: There will be no statistically significant degree of perceived contribution on student accountability pertaining to the use of data notebooks. Considering the statistically significant finding achieved for research question one, the null hypothesis ($H_0 1$) was rejected.

Research Question 2

To what extent do teachers perceive data notebooks contribute to academic motivation in

the classroom?

A one sample *t* test statistical technique was used to assess the statistical significance of mean score finding of 4.09 (*SD* = 0.90) in research question two. The result of the two-tailed one sample *t*-test was statistically significant $t_{(44)} = 8.12$, $p < .001$), indicating the null hypothesis may be rejected. The magnitude of study participant response to the notion that data notebooks contribute to academic motivation in the classroom was considered very large at *d* = 1.21. The assumption of data array normally was satisfied by virtue of the skew value of -0.93 was within the acceptable parameters of -2.0/+2.0, and the kurtosis value of 0.29 was within the acceptable parameters of -7.0/+7.0 offered by George and Mallery (2018). Table 5 contains a summary of findings for research question two.

Table 5

Summary of Finding: Perceptions of Data Notebooks Contributing to Student Academic Motivation in the Classroom

Classroom Element	*M*	*SD*	μ	*t*	*p*	*d*
Academic Motivation	4.09	0.90	3	8.12	< .001	1.21

Note. Degrees of Freedom for the *t*-statistic = 44. *d* represents Cohen's *d*.

$H_0 2$: There will be no statistically significant contribution to perceived student motivation in the classroom by using data notebooks. In light of the statistically significant finding achieved for research question two, the null hypothesis ($H_0 2$) was rejected.

Research Question 3

To what extent do teachers perceive data notebooks as an integral part of the instructional process in the classroom?

A one sample *t* test statistical technique was used to assess the statistical significance of mean score finding of 4.11 (*SD* = 0.96) in research question three. The result of the two-tailed, one sample *t*-test was statistically significant *t* $_{(44)}$ = 7.77, *p* < .001), indicating the null hypothesis may be rejected. The magnitude of study participant response to the notion that data notebooks are an integral part of the instructional process was considered approaching a very large effect at *d* = 1.16. The assumption of data array normally was satisfied by virtue of the skew value of -0.88 was within the acceptable parameters of -2.0/+2.0, and the kurtosis value of -0.12 was within the acceptable parameters of -7.0/+7.0 offered by George and Mallery (2018). Table 6 contains a summary of findings for research question three.

Table 6

Summary of Finding: Perceptions of Data Notebooks as an Integral Part of the Instructional Process in the Classroom

Variable	*M*	*SD*	μ	*t*	*p*	*d*
Overall Importance: Data Notebooks	4.11	0.96	3	7.77	< .001	1.16

Note. Degrees of Freedom for the *t*-statistic = 44. *d* represents Cohen's *d*.

H$_0$ 3: There will be no statistically significant effect for perceptions that data notebooks represent an integral part of the instructional process in the classroom. In light of the statistically significant finding achieved for research question three, the null hypothesis (H$_0$ 3) was rejected.

Follow-up Analysis

An ancillary, follow-up analysis was conducted using the multiple linear regression statistical technique. At issue was the predictabilities of the three most robust correlates of the dependent variable of study participant perceptions that data notebooks represent an integral part of the instructional process in the classroom.

The Pearson product-moment correlation coefficient (r) was used to evaluate the association between elements of classroom instruction and study participant perceptions of the notion that data notebooks represent an integral part of the instructional process in the classroom.

Table 7 contains a summary of findings for the top three correlates of study participant perceptions of the notion that data notebooks represent an integral part of the instructional process in the classroom.

Table 7

Top 3 Correlates of Study Participant Perceptions of the Notion that Data Notebooks Represent an Integral Part of the Instructional Process in the Classroom

Classroom Element	n	r
Setting Academic Goals	45	.68***
Achievement Motivation	45	.67***
Eagerness to Learn	45	.66***

***$p < .001$

The multiple linear regression statistical technique was then used to determine which of the three correlates represented the most viable predictor of study participant perceptions of the notion that data notebooks represent an integral part of the instructional process in the classroom. The predictive model used to address the ancillary analysis was statistically significant ($F_{(3,41)} = 21.38$, $p < .001$, $R^2 = 0.61$), indicating that approximately 61% of the variance in study participant perceptions of the notion that data notebooks represent an integral part of the instructional process in the classroom is explainable by the independent predictor variables of "Setting Academic Goals", "Achievement Motivation", and "Eagerness to Learn." The independent predictor variable of "Setting Academic Goals" represented the most viable and only statistically significant predictor of in study participant perceptions of the notion that data

notebooks represent an integral part of the instructional process in the classroom ($B = 0.56$, $t_{(41)}$ = 3.48, p = .001). The finding indicates that on average, a one-unit increase of study participant perceptions of "Setting Academic Goals" will increase the value of the dependent variable in study participant perceptions of the notion that data notebooks represent an integral part of the instructional process in the classroom by 0.56 units.

The independent predictor variable of "Achievement Motivation" did not significantly predict study participant perceptions of the notion that data notebooks represent an integral part of the instructional process in the classroom ($B = 0.26$, $t_{(41)} = 1.41$, p = .17). The independent predictor variable of "Eagerness to Learn" also did not significantly predict study participant perceptions of the notion that data notebooks represent an integral part of the instructional process in the classroom ($B = 0.25$, $t_{(41)} = 1.50$, p = .14).

Table 8 contains a summary of finding for the predictive modeling used to address the ancillary, follow-up analysis.

Table 8

Predicting Study Participant Perceptions of the Notion that Data Notebooks Represent an Integral Part of the Instructional Process in the Classroom:

Model	B	SE	95% CI	β	t	p
(Intercept)	-0.30	0.59	[-1.50, 0.90]	0.00	-0.51	.614
Setting Academic Goals	0.56	0.16	[0.24, 0.89]	0.41	3.48	.001
Achievement Motivation	0.26	0.18	[-0.11, 0.62]	0.24	1.41	.167
Eagerness to Learn	0.25	0.17	[-0.09, 0.59]	0.25	1.50	.140

Summary

Chapter Four contained a report of the findings achieved in the study. Noteworthy levels of survey completion rate and internal reliability of study participant response to survey items on the research instrument were achieved in the study. Statistically significant findings were manifested in the study's two research questions. Study participant perceptions of the positive influence and importance of data notebooks was evident in all survey items represented on the study's research instrument. Overall, study participants perceived data notebooks as representing an integral part of the instructional process in the classroom. The findings of an ancillary, follow-up analysis illustrated the predictive prowess of the study participant perceptions of "students have learned how to set academic goals since the implementation of data notebooks" for the dependent variable of study participant perceptions of the notion that data notebooks represent an integral part of the instructional process in the classroom.

V. DISCUSSION

Contemporary educational settings are transitioning from conventional lesson plans and focusing more on an individual child's strengths and weaknesses to drive instruction (Kaur, 2017). When teachers focus on personalized learning, the student becomes motivated for academic achievement (Hughey, 2020). Researchers have validated the notion that implementing learning goals in the classroom motivates students (DeMink-Carthew et al., 2017; Froiland & Worrell, 2016; Pounds & Cuevas, 2019; Sides & Cuevas, 2020).

The purpose of the present study was to evaluate teachers' perceptions of how the implementation of data notebooks impacted students. The study focused on the perceptions of teachers with various expertise and experiences in an elementary school in Northeast Florida. Chapter Five provides an interpretation and discussion of the study's findings, implications for professional practice, and recommendations for future research.

Discussion of Preliminary Findings

Preliminary analyses were conducted to evaluate missing data/completion rate, internal reliability, and descriptive findings. The study's essential data arrays reflected no missing data. Data points were considered 100% complete (405 of a possible 405 data points). The results of the study also demonstrated an excellent internal reliability level ($\alpha = .93$). Considering the study's completion rate and excellent internal reliability level, the study's findings are reliable and trustworthy. An additional finding of importance reflected in the preliminary analyses was

that the data arrays in the nine areas associated the study's response to data notebooks were normally distributed. The normal distribution of essential data arrays was important in that any subsequent inferential analyses would require the assumption of data normality to be satisfied. The area with the largest effect size was goal setting ($d = 1.89$[a]). Teachers perceive that data notebooks represented a source of positive reinforcement for students as they move towards their academic goals. Progress monitoring also had a large effect size ($d = 1.75$[a]), indicating teachers perceive data notebooks represented an effective tool teachers can use to progress monitor their students. Similarly, student accountability had a large effect size ($d = 1.65$[a]) suggesting teachers perceive data notebooks as tool used to hold students accountable as students track their goals.

Discussion of Findings by Research Question

Research Question 1

To what extent do teachers perceive data notebooks contribute to student accountability in the classroom?

$H_0 1$: There will be no statistically significant degree of perceived contribution on student accountability pertaining to the use of data notebooks.

In light of the hypothesis, teachers' perceptions that data notebooks contribute to student accountability in the classroom reflected a high degree of mean agreement. The finding was statistically significant with the magnitude of effect for study participant perceptions that data notebooks contributed to student accountability in the classroom was considered to be very large at $d = 1.65$. According to Klvacek et al.'s (2017) research, implementing book logs held students accountable and increased the students' reading levels. Additionally, Thibodeaux et al. (2019) found when students have a say in their learning process, students develop a sense of ownership and feel empowered in their learning. In classrooms where data notebooks were implemented,

students were able to analyze their personal data, set goals based off the data, and track the progress towards the goal set. Students had buy-in to their personal data, which, in turn promoted noteworthy levels of student accountability.

Research Question 2

To what extent do teachers perceive data notebooks contribute to academic motivation in the classroom?

$H_0 2$: There will be no statistically significant contribution to perceived student motivation in the classroom by using data notebooks.

Contrary to the hypothesis, teachers' perceptions that data notebooks contribute to academic motivation reflected a high degree of mean agreement. The effect for study participant perceptions that data notebooks contributed to academic motivation in the classroom was considered very large at $d = 1.21$. DeMink-Carthew et al.'s (2017) research supported data notebooks' contribution to academic motivation in the classroom. The researchers found that goal setting increased student motivation when combined with student-teacher collaboration. Wilburne and Dause (2017) added to the goal setting research stating that students who are taught to set goals continue to strive for greater academic performance. Data notebooks are centered around setting academic goals. Students set their own goals and then track the progress towards meeting the goal in their data notebook.

Research Question 3

To what extent do teachers perceive data notebooks as an integral part of the instructional process in the classroom?

$H_0 3$:There will be no statistically significant effect for perceptions that data notebooks represent an integral part of the instructional process in the classroom.

The null hypothesis is rejected. Data notebooks would appear to be an integral part of the instructional process as evidenced by the high degree of study participant mean agreement in research question three. The magnitude of the effect for study participant response that data notebooks represent an integral part of the instructional process was considered approaching a very large effect at $d = 1.16$. Wilburne and Dause's (2017) study supported data notebooks as an integral part of the instructional process. The study noted that students who are taught to set goals continue to strive for greater academic achievement. Although Wilburne and Dause's study did not implement data notebooks, the concept of goal setting and academic achievement are consistent with findings similar in nature in the current study.

Study Limitations

The current study was delimited to one school within one school district located in one state in the Southeastern United States. Therefore, the results may not be generalizable beyond the population accessed for study purposes. A second limitation associated with the study was the timeframe of the study itself: the study was conducted during the COVID-19 pandemic. The implementation of data notebooks was able to take place prior to remote learning, but the data achieved in the study was collected while teachers were teaching remotely. A third limitation was associated with the matter of implementation fidelity in that the teachers participating in the study were not specifically monitored for fidelity. As a result, the degree and consistency of implementation fidelity could not be confirmed nor documented for study purposes.

Implications for Future Practice

In the wake of the current study's findings, it would appear that the implementation of data notebooks in the classroom will benefit students, teachers, and administrators. Data notebooks may include student goals, student progress, and graphs resulting in academic

improvement. Ennis et al.'s (2017) research found students who use self-monitoring and self-tracking increase academic engagement and academic performance. When data notebooks are implemented in the classroom, students are encouraged to graph assessments, take ownership of their learning, and take responsibility for academic achievement.

Data notebooks encourage student motivation in the classroom and allow students to become interested in their own learning. As a result, the student is empowered by the control over the data and then becomes motivated to grow academically (Wilburne & Dause, 2017).

As noted in the study's findings, data notebooks are perceived to be an integral part of the instructional process. Implementing data notebooks in the classroom begins with the teacher and student analyzing student data together. Then, personalized learning goals are set by the student. The teacher and student then regularly monitor the progress toward the personalized learning goals. Implementing data notebooks in classrooms and schools would appear to be a viable intervention for teachers in addressing learning gaps and improving academic achievement of all students. Data notebooks would also appear to be of great benefit to the classroom teacher. One specific instructional advantage afforded teachers with the use of data notebooks relates to increased and enhanced access to each students' strengths, weakness, and data points in one location (Zafiropoulou & Darra, 2019).

Recommendations for Future Research

Recommendations for future research include first replicating the study using a larger sample size across multiple schools. The present study was delimited to one school. Replicating the study with a larger sample size could provide more depth and richness of data based on the inclusion of a broad range of demographic information (gender, ethnicity, subgroups, and region), as well as greater potential for generalization of finding.

Future studies focusing upon an evaluation of fidelity of implementation would appear to provide greater clarity to data notebook efficacy. For instance, a predictive relationship may be evident in the degree of implementation fidelity and teacher perceptions of data notebook importance as well as for student achievement.

Future research could also include a focus upon an evaluation of the components of data notebooks that are most effective: goal setting, graphing, or data chats with teachers. Future studies should also evaluate the implementation of data notebooks using assessment data for comparative purposes. Utilizing a more empirical approach would perhaps provide greater clarity into the efficacy data notebook implementation; the current study was non-experimental in nature and limited to perceptions.

Finally, it would appear beneficial to address the topic with an additional qualitative component. A follow-up qualitative study component through a mixed-methods research design would appear to add considerable depth, richness and thickness of information to supplement the information achieved quantitatively.

Conclusion

Teachers are tasked with improving student achievement (Jimerson, Cho, Scroggins, Balial, & Robinson, 2019) and data notebooks are a tool that administrators could implement to strengthen student achievement. Data notebooks can help students learn to self-monitor, self-evaluate, and set goals (Wehmeyer et al., 2017). The current research study evaluated teachers' perceptions of data notebooks, student accountability, and motivation after full implementation. The research study also evaluated teachers' perceptions of data notebooks as an integral part of the instructional process. The data from this study indicated teachers perceive implementing data notebooks increases student accountability and student motivation in the classroom. The results

also indicate that teachers view data notebooks as an integral part of the instructional process. Implementing data notebooks in today's classrooms represent a viable and useful means by which students and teachers may focus on the strengths of the individual student. In addition, data notebooks motivate students and offer guidance to teachers as they plan their instruction.

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<center>**Appendix**</center>

<center>**Survey Instrument: An Evaluation of Student-Led Data Notebooks**</center>

1. Please click NEXT if you choose to participate. By clicking NEXT, you are indicating that you freely and voluntarily agree to participate in this study, and you also acknowledge that you are at least 18 years of age.
   - Next

2. Which category best describes where you spend the majority of your teaching time?
   - Primary Grade
   - Intermediate Grade
   - Other (please specify)

Directions:

When answering the following questions, please reflect on your personal use of data notebooks within the past school year. Reflect on your prior experiences with students who did not use data notebooks. Identify any change in attitudes by the majority of your students.

Student Accountability

3. Students possess a greater sense of responsibility since the implementation of data notebooks.
   - Strongly Disagree
   - Disagree
   - Uncertain
   - Agree
   - Strongly Agree

4. Students have learned how to set academic goals since the implementation of data notebooks.
   - Strongly Disagree
   - Disagree
   - Uncertain
   - Agree
   - Strongly Agree

5. Students are better able to monitor their progress towards a goal since the implementation of data notebooks.
   - o Strongly Disagree
   - o Disagree
   - o Uncertain
   - o Agree
   - o Strongly Agree
6. Students have taken ownership of their academic performance since the implementation of data notebooks.
   - o Strongly Disagree
   - o Disagree
   - o Uncertain
   - o Agree
   - o Strongly Agree

Academic Motivation

7. Student motivation to achieve academically has increased with the use of data notebooks.
   - o Strongly Disagree
   - o Disagree
   - o Uncertain
   - o Agree
   - o Strongly Agree
8. Students have become more eager to learn since the implementation of data notebooks.
   - o Strongly Disagree
   - o Disagree
   - o Uncertain
   - o Agree
   - o Strongly Agree
9. The use of data notebooks has represented a source of positive reinforcement for students when they move towards or reach their academic goals.
   - o Strongly Disagree
   - o Disagree

      o   Uncertain

      o   Agree

      o   Strongly Agree

10. Students are more enthusiastic to master academic skills since the implementation of data notebooks.

      o   Strongly Disagree

      o   Disagree

      o   Uncertain

      o   Agree

      o   Strongly Agree

11. Overall, data notebooks are an integral part of the instructional process in my classroom.

      o   Strongly Disagree

      o   Disagree

      o   Uncertain

      o   Agree

      o   Strongly Agree

12. What is the greatest impact data notebooks have had on your classroom?