8-2017

The Effect of Implementing Hess' Cognitive Rigor Matrix Within Fifth-Grade Independent Learning-Contracts Upon Student Engagement and Time-on-Task

Andrea Carlson
St. Catherine University

Recommended Citation

The Effect of Implementing Hess' Cognitive Rigor Matrix within Fifth-Grade Independent

Learning-Contracts Upon Student Engagement and Time-on-task

Submitted on August 6, 2017

in fulfillment of final requirements for the MAED degree

Andrea Carlson

Saint Catherine University

St. Paul, Minnesota

Advisor:_____   Date:_____

Abstract

The purpose of this research was to determine whether or not implementing Hess' Cognitive Rigor Matrix within fifth-grade independent learning contracts would increase student time on task. There were 25 fifth-grade student participants in the study and the study took place over four-weeks. Data was collected through a pre/post-assessment on specific topic, student engagement observation, student/teacher conferences, and the Student Data Gathering Tool. While initial research suggests that the implementation of Hess' Cognitive Rigor Matrix with independent-learning contracts increases student engagement, further research should be done to determine whether or not engagement would be sustained throughout a longer period of time.

Keywords: engagement, learning-contract, personalized, enrichment, Hess' Cognitive Rigor Matrix

The Effect of Implementing Hess' Cognitive Rigor Matrix within Fifth-Grade Independent

Learning-Contracts Upon Student Engagement and Time-on-task

The beginning of the school year is an exciting time for me. I always look forward to seeing my class lists, learning about my students, and planning lessons for a new group of children. This year was no different. However, I was presented a new challenge when I was assigned the "Honors" fifth-grade classroom. This meant all of the students entering my classroom were at or above grade-level in both reading and mathematics. While I was excited to teach this group of students, I quickly found these learners needed additional opportunities to exceed and this would bring a new set of challenges. Enrichment education is often regarded as something extra, or something to try if there is remaining time in the lesson. My students entered the school year excited, motivated and ready to learn. Knowing the importance and difficulty of keeping above-level students engaged, I wondered: how do I continue to challenge my students and keep them engaged throughout the year?

In my fifth grade classroom, there is a 45-minute block of time called small group time. During this time of day, I instruct a small group of 3-5 students for guided reading interventions at my back table. While I am teaching small group lessons, the remaining students are expected to work on assignments individually or read an independent choice book. However, I found that many of my students were not on-task during small group time when expected to work independently and it was no longer an engaging time of day. I wanted to find a way to keep my students challenged, engaged, and on task while working independently.

Additionally, I also provide whole-group instruction to my students in the subjects of math, reading, science, social studies, and spelling. These lessons typically begin with me teaching the entire class a lesson on a new topic and then assigning my students a task to work on that is related to the academic topic. During this work time, I continually observed my students working at a variety of paces and finishing the tasks at different times. Those students

that finished before the rest of the class lacked a new activity to complete, became bored, and entertained themselves by acting out behaviorally or becoming a distraction to others. My students needed an engaging task they could work on independently so that I could be fully attentive to the small group I was instructing.

The setting for this study took place in a fifth grade classroom at a pre-kindergarten through eighth grade charter school in a metropolitan suburb. Each grade-level has five classrooms totaling approximately 900 students. The school population is diverse with 53% African-American, 20% Caucasian, 14% two or more races, 7% Hispanic, and 6% Asian. 10% of students are English Language Learners and 9% of students qualifying for Special Education services. Additionally, 62% of students qualify for Free and Reduced lunch services.

All participants in this study are in one fifth grade classroom. This classroom has 26 students including 15 females and 11 males. Two students qualify for special education services. This classroom is labeled as an Honors classroom in the school, meaning every student met or exceeded standards on the 2016 Minnesota Comprehensive Assessment (MCA) in math and reading as fourth graders. The Honors students are grouped together to provide necessary enrichment opportunities. This in itself can be a challenge, but the additional challenge of leading an Honors class is keeping all students engaged at all times.

This challenge of constant enrichment-focused engagement led me to the topic of this research. My review of the literature on enrichment education shaped the design of my independent-learning contract intervention.. This action research focused on the following question: What effect does implementing Hess' Cognitive Rigor Matrix within fifth grade independent learning contracts have upon student engagement and time-on-task?

Literature Review

Students of varying academic abilities, background knowledge, and experience are filling today's diverse classrooms. While there are many known interventions and instructional strategies to support struggling readers, enrichment opportunities for above-level students often lack in classrooms. According to a study completed by the National Resource Center of the Gifted and Talented, "Talented readers received little to no differentiation for reading…students who read above grade level usually received instructional and curricular materials identical to those of students who read at grade level" (Reis, Eckert, McCoach, Jacobs, & Coyne, 2008, p. 299). There is a need for quality enrichment implementation for above level learners. Implementing Hess' Cognitive Rigor Matrix into instruction can provide an opportunity for educators to challenge learners in different ways (Hess, Carlock, Jones, & Walkup, 2009b). In the following paragraphs, differentiation, enrichment, and acceleration are each defined, personalized education methods are described, challenges in enrichment are identified, and the Hess' Cognitive Rigor Matrix is explained.

Definitions

Differentiation. For the purpose of this research, definitions provided by Hall (2002) and Tieso, (2004) will be utilized for understanding differentiation. Hall (2002) defines differentiated instruction as,

> A process to approach teaching and learning for students of differing abilities in the same class. The intent of differentiating instruction is to maximize each student's growth and individual success by meeting each student where he or she is, and assisting in the learning process (p. 2).

Differentiated instruction includes the use of pre-assessment, flexible grouping practices, student choice and preferences, and collaborative teaching (Tieso, 2004).

Enrichment. For the intents of this research, enrichment will be synonymous with

extension (Beecher & Sweeny, 2008; Yeng, 2005). Yeng (2005) defines enrichment as, "any

experience that replaces, supplements, or extends instruction beyond that normally offered by the

school" (p. 2). Enrichment provides the extension of the typical academic curriculum for

students to study a topic in depth (Beecher & Sweeny, 2008).

Acceleration. Acceleration is a process in which students move through academics more

quickly than the typical pace of learning or jump grade levels (Castellano, 2010). Acceleration

allows students to move more quickly through the curriculum, assuming students are motivated

and ready to do so (Castellano, 2010). Acceleration is not enrichment.

Enrichment opportunities and strategies

Personalized education. One essential component of effective enrichment education is

personalized education. According to Olanchek (2001), differentiation must be personalized to

be effective for gifted students. Teachers are not only responsible for students' education;

students are responsible for evaluating their learning interests and preferred learning methods

(Olancheck, 2010). Students in need of enrichment often are not getting the instruction they

require due to the overall demands of the whole class (Renzuli & Reis, 1998). Personalized

education allows for the needs of all students to be met (Renzuli & Reis, 1998).

Learning contracts. Above-level students are often not given opportunities to be

challenged in the classroom (Renzuli & Reis, 1998). Learning contracts are one method for

personalizing education to engage and motivate above level learners (Boyer, 2003). According

to Boyer (2003), learning contracts are a basic form for creating individualized assignments

with personal learning objectives. Boyer (2003) describes eight steps for the creation and

implementation of learning contracts; "Diagnose learning needs, specify learning objectives,

specify learning objectives and resources, specify evidence of accomplishment, specify how the

evidence will be validated, review of the contract, carry out the contract, and evaluation of

overall learning"(p.51). Developing and carrying out learning contracts require teachers to

identify learning preferences and prepare activities that are ideal for each student, which

increases engagement and learning in students (Boyer, 2003; Stephenson & Laycock, 2005).

Learning contracts also require students to identify their own learning preferences, strengths,

and areas to improve as they work with their teacher to agree upon a learning contract (Boyer,

2003). Completing learning contracts allow students to take ownership and be accountable for

their own learning (Stephenson & Laycock, 2005). While most students in Boyer's (2003) study

enjoyed the process of using learning contracts, some were uncomfortable with the

"untraditional nature" of learning contracts (p.373).

   Schoolwide enrichment programs. Much success has been found in meeting the goal of

engaging students and enhancing learning all the while empowering student voice, choice and

honoring true differentiation (Allen, 2016; Beecher, 2008; Renzuli & Reis, 1998). One program

that has found success in providing enrichment opportunities is the implementation of

Schoolwide Enrichment Models (Reis et al., 2008). Schoolwide Enrichment Models (SEM) are

programs designed to increase engagement inside the classroom (Renzuli & Reis, 1998). The

SEM model includes three services: Identifying and encouraging students to learn about topics

that interest them, using curriculum modifications and compacting, and allowing students to self-

choose activities (Reis et al., 2008). Reis (2008) completed a study to assess the effectiveness of

implementing the SEM-R model compared to regular reading instruction with third-fifth grade

students in two schools. The results of this study found that the group of students using the SEM

model scored significantly higher (Renzuli & Reis, 1998).

Another enrichment program implemented is the Writer's Workshop model (Beecher, 2008). The Writer's Workshop model encourages students to "develop their own voice through writing" (Beecher, 2008, p.510). This program allows for differentiated instruction by allowing students to work at their own pace, learn, and be informally assessed by teachers through one-on-one student -teacher conferences (Beecher, 2008). Students are challenged and kept engaged by developing their writing at the stage for which they are ready (Beecher, 2008).

The results of Schoolwide Enrichment Programs are overall positive. By implementing Schoolwide Enrichment models, gifted students' attitudes towards their learning and school increased, students were more engaged in their learning, and scores in all subject areas increased on statewide assessments. (Beecher, 2008). Allen (2016) found that SEM "promotes diversity and excellence in education by holding high standards for all learners, regardless of age, ethnicity, gender, education, or socioeconomic conditions" (p. 91).

Challenges in Enrichment

While there are many strategies and systems that are successful in providing enrichment education, there are still challenges. Teachers are hesitant to incorporate new practices, even when evidence of success is clear (McAdamis, 2000). Change can bring anxiety and stress, while some teachers see new practices as threatening (McAdamis, 2000). Much of this anxiety is brought on by the uncertainty teachers can be successful with the new practice (McAdamis, 2000). Teachers tend to revert to practices where they have experience (McAdamis, 2000).

Another challenge is that much of the curriculum and literature provided to schools and subsequently, teachers, is not rigorous enough to provide enrichment for gifted learners (Renzuli & Reis, 1998). Renzuli and Reis (1998) report the academic rigor, or difficulty, of academic textbooks has decreased over the last few decades. Renzuli and Reis (1998) also states that

textbooks incorporate a significant amount of content repetition to help non-gifted learners, which only bores and disengages the learner needing enrichment..

Scaffolding Tools for Differentiated Instruction

  Bloom's Taxonomy. Bloom's Taxonomy (See Appendix E) can be used to scaffold questions and increase rigor and understanding (Agarwal, 2011). According to Agarwal (2011), "the original taxonomy include six categories of cognitive skills, ranging from simple to complete: knowledge, comprehension, application, analysis, synthesis, and evaluation" (p.2). Agarwal (2011) explains this taxonomy is a step-by-step process where one must master lower level questions or application before moving on to the next step of higher level questions and application. Teachers often use this taxonomy to encourage their students to "climb to a higher [level of] thought" (Forehand, 2010, p. 2).

  In a study completed by Gillies and Haynes (2001), they found when children are given the opportunity to have their instruction scaffolded by using a variety of levels of questioning, students are more likely to give thoughtful responses than when given one repeated question type. Agarwal (2011) supports this statement as he emphasizes that using a combination of higher and lower level questions allows students to experience a deeper level of understanding. Using a variety of methods to provide evidence of understanding can also increase engagement throughout the lesson (Agarwal, 2011).

  Webb's Depth of Knowledge. Webb's Depth of Knowledge (DOK) (See Appendix F) aids in determining cognitive understanding and application of content (Holmes, 2012). Webb's DOK is similar in structure to Bloom's Taxonomy with levels to use for scaffolding from basic to advanced (Holmes, 2012). The levels are defined as follows:: Level 1: Recall; Level 2: Skill/Concept; Level 3: Strategic Thinking; and Level 4: Extended Thinking (Holmes, 2012).

Hess et al. (2009b) describe these levels as, "dependent upon how deeply students understand and engage with the content, not simply the type of thinking used" (p. 3). While Bloom's Taxonomy categorizes the way the brain processes a new skill, Webb's DOK focuses on the scope of a task from start to finish (Hess et al., 2009b). "Webb's model dictates that depth-of-knowledge levels do not necessarily correlate to the commonly understood notion of 'difficulty'. That is, an activity that aligns to a particular level is not always 'easier' than an activity that aligns to a DOK level above it" (Hess et al., 2009a ,p. 3). Using Webb's DOK can assist teachers in determining how thoroughly students understand the required content to be considered proficient (Hess et al., 2009a). Webb's work has challenged how states design comprehensive assessments as it allows states to decide how in-depth students should demonstrate their understanding of the required content (Hess et al., 2009a; Hess et al., 2009b). Teachers can also use Webb's DOK levels to analyze the alignment of curriculum, instruction, assessment, and standards (Hess et al., 2009b). Additionally, by identifying DOK levels of not only state comprehensive assessments; but also classroom unit assessments, teachers can determine the depth of understanding needed and adjust daily instruction as necessary (Hess et al., 2009b).

    Hess' Cognitive Rigor Matrix. Hess et al. (2009b) created the Cognitive Rigor (CR) Matrix (See Appendix G) to both connect and compare Bloom's Taxonomy and Webb's Depth of Knowledge. By using Hess' CR Matrix, teachers can analyze curriculum and instruction to determine whether or not students will be able to show multiple areas of understanding in one objective (Hess et al., 2009b). Hess et al. (2009b) states, "Because cognitive rigor encompasses the complexity of content, the cognitive engagement with that content, and the scope of the planned learning activities, the CR Matrix can enhance instructional and assessment practices at the classroom level as well" (p. 6). This allows teachers to differentiate their instruction for

individual students and fulfill their responsibility of providing rigorous educational experiences

to all students, regardless of academic ability or learning preferences (Hess et al., 2009a; Hess et

al., 2009b). Applying Hess's CR Matrix to learning tasks increases the complexity of

understanding (Hess et al., 2009a). According to Hess et al. (2009b), "Students learn skills and

acquire knowledge more readily when they can transfer their learning to new or more complex

situations, a process more likely to occur once they have developed a deep understanding of

content" (p. 8).

Conclusion

For enrichment education to be effective, teachers must use personalized and intentional

strategies (Olancheck, 2001). Students need the opportunity to have choice in their learning and

pursue topics of personal interest (Boyer, 2008; Reis et al., 2008). Incorporating enrichment

clusters and learning contracts can allow above level learners to be motivated to take ownership

of their learning (Allen, 2006; Boyer, 2008; Reis et al., 2008). While enrichment education can

be overwhelming for teachers, using Hess' Cognitive Rigor Matrix can assist teachers in

personalizing curriculum and instruction with the appropriate amount of rigor and challenge

(Hess et al., 2009b).

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

The study, lasting four weeks, began in February 2017 and ended in March 2017. The

study used four-data collecting tools including a pre- and post- content assessment (See

Appendix A for pre- and post- assessment collecting table), on-task observation data (See

Appendix B), teacher/student conference data (See Appendix C), and student data gathering tool

via Google Forms (See Appendix D). The purpose of each of these tools was to understand the

effects of implementing personalized learning contracts in a fifth grade classroom.

On the first day of the four week study, I administered a pre-assessment to determine my students' academic levels to effectively create individual learning contracts. The pre-assessment included questions that related to content I would be teaching over the course of the four week study, including the topics of reading learning objectives: cause and effect, problem and solution, and sequencing. The pre-assessment consisted of a combination of reading passages and multiple choice comprehension questions. I graded and recorded the data as the percentage of questions correct. Using students' pre-assessment scores, I created independent learning contracts utilizing Hess' Cognitive Rigor Matrix. Each student's independent learning contract was tailored to their learning preferences and academic needs.

In order to determine my students' on-task behavior prior to implementing independent learning contracts, I observed and recorded their on-task behavior for five days. During each observation, I noted the date and time of the observation, academic subject taking place, setting, number of students in the classroom, and number of students on-task during the observation. I collected data on student time on-task daily during our small group block. I also observed student time on-task behavior during non-independent learning contract times during different academic subjects on a rotational basis during the first week. The purpose of observing student on-task behavior twice a day was to determine whether or not students were on-task more often when able to work on their independent learning contract during their small group block and additional academic block.

After collecting baseline data, I taught the procedure for learning contracts to my class on the first day of week 2. I explained that each student would receive an independent learning contract on the first day of each week. Each student's learning contract was unique to each student and designed to meet their own individual needs. Students completed these assignments

during our small group instruction block when working independently. Students also worked on their independent learning contract if they finish an assignment in another subject early. If a student chose not to work on their learning contract assignment during small group block, then their choice for independent work would be reading.

Once independent learning contracts were implemented on week 2, day 1, I continued to observe and collect data on my class' on-task behavior during our small group block and an additional academic block daily. An instructional coach from my building also occasionally observed and documented my class' on-task behavior so that I could continue my regular teaching tasks and also to provide inter-rater reliability.

During teacher-conferences, I met individually with students for approximately five to ten minutes regarding their independent learning contract and progress. During these conferences, I recorded the content of our conversations and notes about in-progress or completed assignments. I met with approximately five students per day, but due to unforeseen schedule changes, sometimes I had to meet with more or less students or make up conferences during a different time of day. There were also instances when a student was absent for a significant amount of time and I chose to use their independent learning contract conference time to catch he or she up on essential content that was missed. These occurrences were documented as well.

At the end of the study, each student completed a post-assessment. The questions on the post-assessment were based on the same content-focused learning targets as the pre-assessment, but with different reading passages and comprehension questions. As done for the pre-assessments, I graded and recorded the results of the post-assessment using percentages. I used

the results of the post-assessment data to determine whether or not students improved in their

mastery of specific learning targets during the study and use of independent learning contracts.

Once the study was complete, my students completed the Student Data Gathering Tool

via Google Forms (See Appendix D). Before giving the Student Data Gathering Tool to my

students, I explained the purpose of the Student Data Gathering Tool was for me to receive their

feedback on independent learning contracts and the results would be used during this study. I

reminded my students their answers would remain anonymous and I wanted their honest

opinions. I also read each question of the Student Data Gathering Tool aloud to my class to avoid

any confusion with language or the content of the questions.

This Student Data Gathering Tool asked students' for their attitudes towards independent

learning contracts and gave opportunities for students to indicate whether or not they found

independent learning contracts to be beneficial towards their learning. Students also responded

on how I could improve independent learning contracts for future classes. Each student

completed the Student Data Gathering Tool independently on my school laptop one at a time..

Due to student absences and time-restraints due to required standardized testing, 22 of 26

students completed the Student Data Gathering Tool.

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

Student Engagement

During the first five days of the study, I collected baseline data using the on-task

observation form to determine whether or not students were engaged during independent work

times prior to the independent learning contract intervention. To determine student engagement, I

recorded the number of students on-task compared to the number of students observed off-task. I

recorded student engagement daily during our small group block and during another academic

subject for a total of two observations per day. The baseline data is shown on Figure 1.

　　　After collecting the baseline data for student engagement, I implemented the independent

learning contract intervention for 3 weeks. I continued to record student engagement daily during

our small group block and during another academic subject throughout those three weeks. Figure

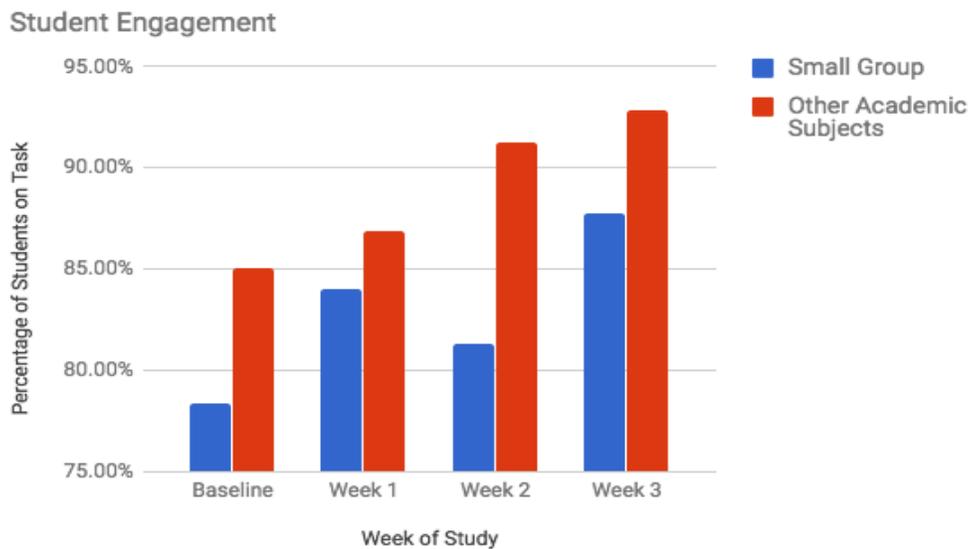1 shows the average percentage of students on-task during each week of the study.

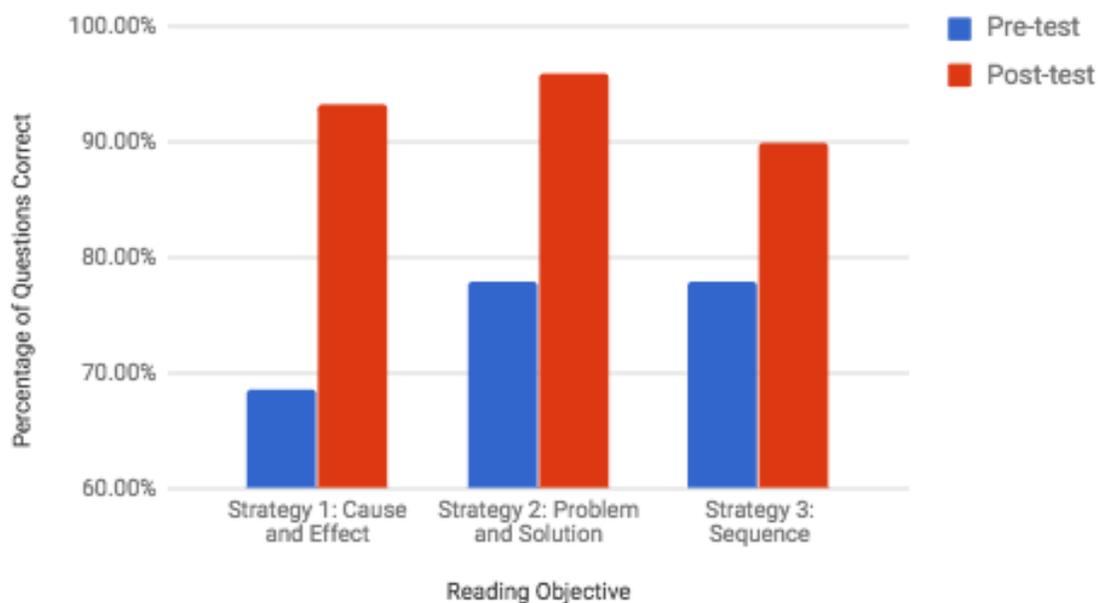*Figure 1.* Student engagement

　　　Figure 1 shows student on-task behavior increased throughout the intervention in both

our small-group block and other academic subjects. During our small-group block, the baseline

data for student engagement was 78.41% of students on-task. After the independent learning

contract intervention was implemented, the percentage of students on-task ranged from 81.47%

to 87.73% during the three week time period. Student engagement during other academic

subjects also increased from the baseline data of 85.07% students on-task to a range of 86.85% to

92.86% after the intervention was implemented.

Pre-Assessment and Post-Assessment

The purpose of wanting to increase student engagement is to increase student academic achievement. During the study, I taught three reading strategies: cause and effect, problem and solution, and sequence. I administered a pre-assessment and post-assessment for each of the strategies to determine whether or not students improved on their mastery of the strategy during the three week study I recorded the results of the pre- and post-assessments and from this data, determined whether or not students made academic growth.

Figure 2 shows the results of the pre- and post-assessments. I scored each assessment and found the class average score. The results of the post-assessment when compared to the pre-assessment show academic growth for each reading strategy. The class average scores increased 24.7% for Strategy #1: cause and effect, 20.1% for Strategy #2: problem and solution, and 17.4% for Strategy #3: sequence. While the independent learning contract intervention could have led to the increase in student academic achievement, it is possible that whole-group reading instruction impacted the results as well.

Figure 2. Pre-assessment and post-assess

ment results

Teacher Conference Observations

For three weeks, I met with each student once a week to discuss their learning contract. Conferences were used as a qualitative assessment on the effectiveness of the implemented independent learning-contracts so I could adjust the contracts as needed throughout the intervention to meet the student's needs. I initially planned on recording the number of independent learning contract assignments each student completed, but quickly realized that would not be an effective measure of student engagement. This is because some students chose small, short assignments and some students chose assignments that required more time. Students who completed a smaller number of tasks were not necessarily less engaged than students who completed a larger number of shorter tasks. While my plans for data collection changed, I still gathered a large amount of valuable information while completing these conferences.

During these weekly conferences, I recorded the type of assignments completed, the number of assignments completed, and observations on the quality of the assignments completed. Students #6, #12, and #25 consistently chose to work on longer, more complicated tasks which required a large amount of engagement. I recorded that their assignments were of high quality. Respectively, students #3 and #17 consistently chose shorter assignments. I observed that these students seemed to finish the assignments quickly and without much thought. A question emerged from this data as I wondered if these students were truly engaged during independent work time or if the assignments were simply busy work.

While looking at the conference data, I looked to see if there were any students that started the intervention by choosing shorter assignments and began choosing more advanced assignments. I did not notice any changes in assignment choices throughout the intervention.

This could be because students that chose simpler tasks were more comfortable with these types

of assignments and needed more guidance from me during conferences to be successful. This

could also be because the length of the research study, three weeks, was too short.

Student #9 consistently did not have any assignments completed each week during the

intervention. Even when I adjusted his learning contract assignments to meet his zone of

proximal development, he still was not coming to his conference with a completed assignment. I

realized that for him, I needed to find a different way to keep him engaged during independent

work times.

Throughout the conferences, I had several students asking for specific tasks to be added

to their independent learning contracts. Students #7, #24, and #25, asked for more math

assignments during their conferences. Student #27 asked if she could have more writing

assignments added to her independent learning contract that were related to the week's learning

objectives. I was able to use this information to adjust each independent learning contract to

make the contracts more engaging for the particular student.

Another source of data collected, was when students created their own assignments they

wanted added to their independent learning contracts. After the first week, I quickly observed

that student #18 was able to complete each task easily indicating a need to be challenged.

Together, we were able to brainstorm an independent research project on cheetahs that she

created. We checked in each week on her progress and I recorded high levels of achievement and

excitement, which ultimately indicated a high level of engagement. Students #13 and #17, who

typically had a difficult time working independently, created their own note-taking assignment

on a book of their choice. During their conferences, I recorded the quality of work was higher

than what I typically observe from them. This provided evidence that when student voice and

choice are inserted into work, engagement increases and the quality of work subsequently increases.

Throughout the intervention, I had several students ask to meet with me to share their learning contract assignments above and beyond the weekly conference. I made note of this and recorded the context of our discussion. Student #11, who typically avoided work tasks, asked to meet five times to show me his assignment during the three week intervention. Student #25 asked to meet two times after our initial conference to show me the improvements she had made to her writing assignment. Students #12, #20, and #24, also asked for meetings to show what they had been working on throughout the week. All of these extra meetings indicate these students were excited and proud of what they are working on. When students are excited about what they are working on, they are more engaged in their learning, which leads to greater academic achievement

Student Data Gathering Tool

Once the study and independent learning contract intervention was complete, I had my students independently complete a Google Form to gather feedback on the independent learning contracts. Students were told they would not be graded on their responses and their honesty would be used to help future classes and for this study. Each question was not required, thus some students chose not to respond to all the questions on the Student Data Gathering Tool.

The first question asked, "From a scale of 1-10, what are your overall feelings towards learning contracts?". On the scale, "1" stood for, "I did not enjoy learning contracts" and 10 stood for, "I really enjoyed learning contracts". The results are shown on Figure 3.

The mode response for this question was a 5 and 6, showing my students had neutral feelings towards their independent learning contracts. This information indicates that my

students somewhat enjoyed their independent learning-contracts, but I will need to adjust the

intervention to positively improve their liking of the learning contracts.

Question 1 of Student Data Gathering Tool: "From a scale of 1-10, rate your overall feelings towards learning contracts".
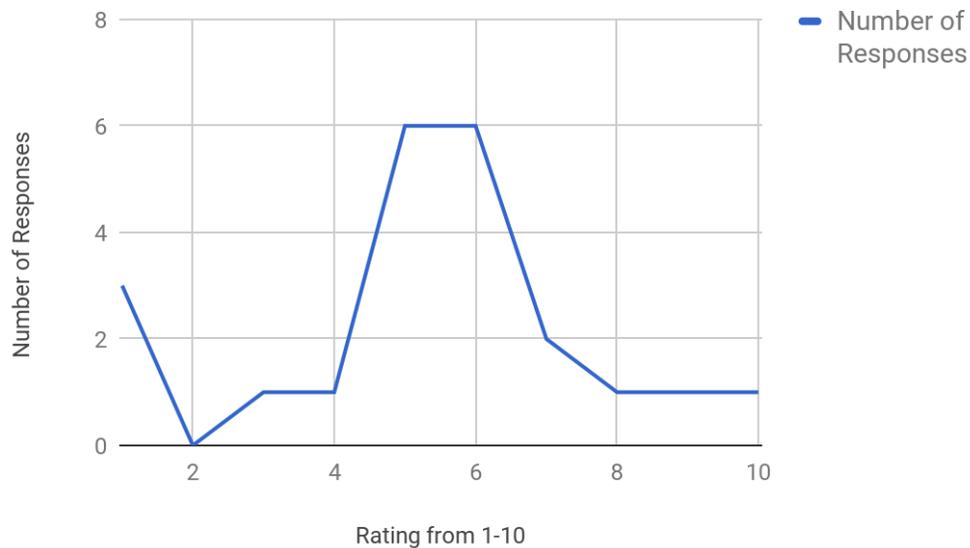

Figure 3. Question 1 of Student Data Gathering Tool results

The second question asked students to describe the level of challenge within their

learning contract. Students rated their learning contract from a 1-5, "1" meaning "too

challenging" and "5" meaning "too easy". Figure 4 shows the student responses. The mode

response was a 3, with 72.7% scoring a 3 or higher which indicates most students felt the

difficulty of their learning contract was appropriate. However, 27.3% of students responded with

a "2", meaning their independent learning contract was a bit too challenging. It is unknown

whether or not students felt the amount of tasks were challenging or the content of the tasks

themselves.

Question 2 of Student Data Gathering Tool: "From a scale of 1-5, how challenging was your learning contract?"
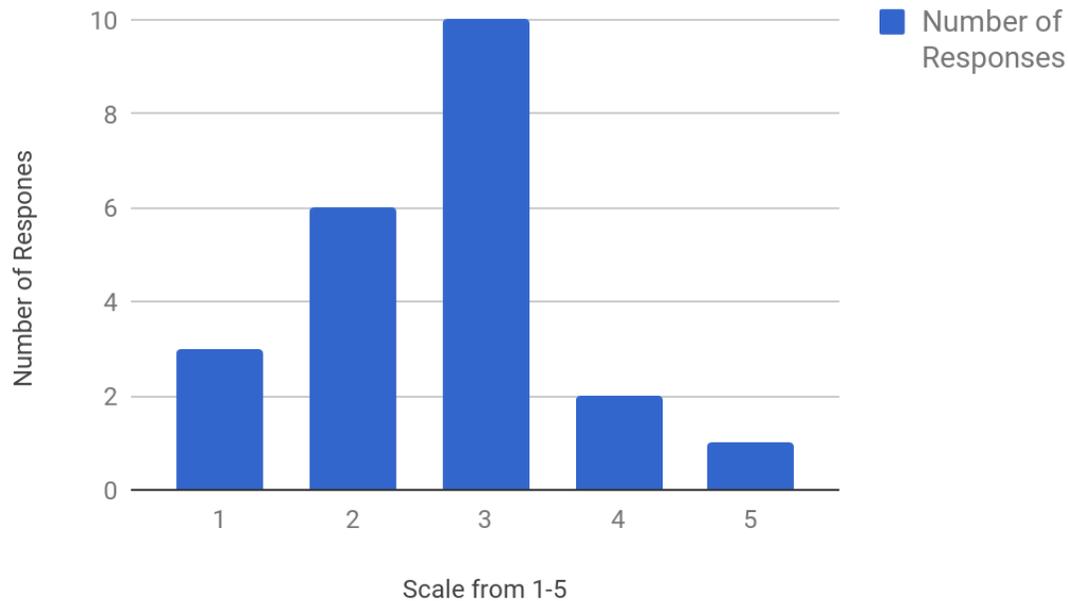
Figure 4. Question 2 of Student Data Gathering Tool

The third question of the Student Data Gathering Tool asked, "Was the amount of assignments expected reasonable?". Students were given the option to respond "yes" or "no". Figure 5 shows 64.7% responded the amount of assignments were reasonable and 35.3% of students responded the amount of assignments were not reasonable. It is unknown whether or not students responding with the work was unreasonable believed there should be fewer assignments or more assignments.

Was the amount of assignments expected reasonable?

17 responses
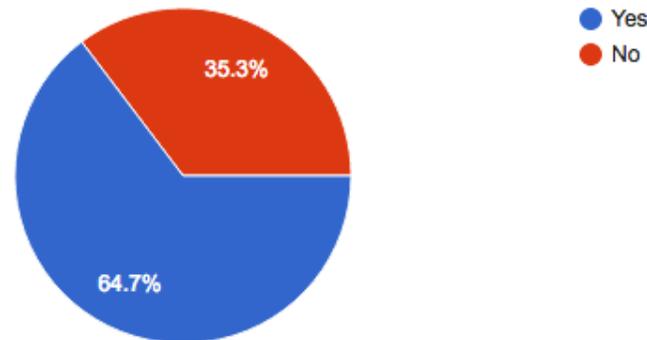
Figure 5. Question 3 of Student Data Gathering Tool

The fourth question on the Student Data Gathering Tool asked students, "Were one-on-one conferences with Ms. Carlson helpful?". Students had the option to respond "yes", "no", or "neutral". Figure 6 shows the majority, 59.1%, of students responded the conferences were helpful. Almost a third, or 31.9% of the students responded 'neutral' to whether or not one-on-one conferences were helpful while 9.1% of students responded the conferences were not helpful to their learning.

Were one-on-one conferences with Ms. Carlson helpful?

22 responses
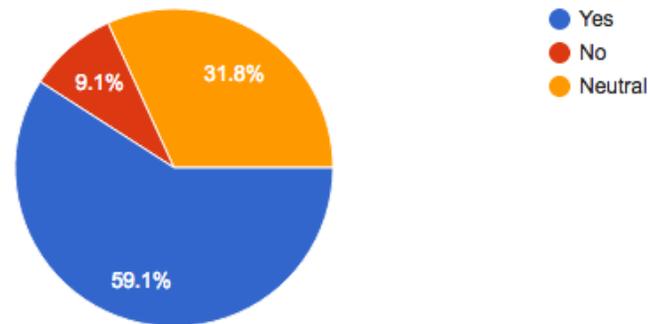
Figure 6. Question 4 of Student Data Gathering Tool

Students were also asked whether or not I should complete learning contracts with future students. Students had the option to choose "yes", "no", or "neutral". The responses are shown on Figure 7. The majority, or 63.6%, of students responded that future classes should complete independent learning contracts. This suggests the majority of my students enjoyed independent learning contracts and believe other students would too. Twenty-seven percent of the students answered with neutral, it is unclear whether or not they enjoyed or disliked learning contracts. A small percentage, 9.1%, of the students did not think I should continue independent learning contracts with future students.

Should Ms. Carlson complete learning contracts with her future classes?

22 responses
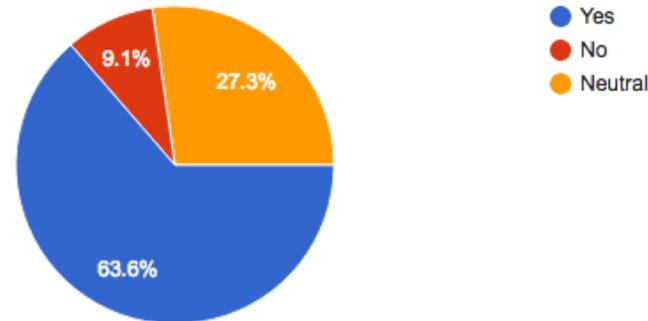
Figure 7. Question 5 of Student Data Gathering Tool

The last question of the Student Data Gathering Tool asked, "What should Ms. Carlson do to improve learning contracts for next year?". This was an open ended response. I categorized the responses into seven categories as shown on Figure 8. While any data directly from students, is good data, this particular set was not beneficial to the study. Only 60% of the students chose to respond to this question and The student responses given did not have a common theme. Due to the variety of responses provided on how to improve independent learning-contracts, I will need to continue to adjust learning contracts on a personal basis to meet the needs of all of my students.

How Can Ms. Carlson Improve Learning Contracts for Next Year?
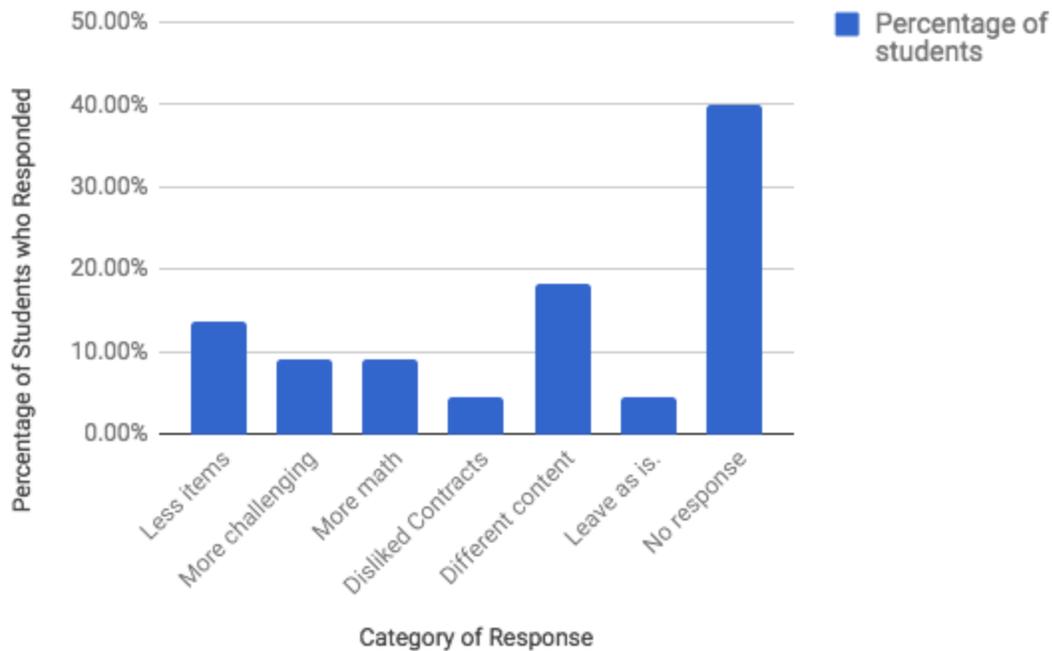
Figure 8. Question 6 of Student Data Gathering Tool

Action Plan

The focus of this study was to determine whether or not implementing independent learning contracts using Hess' cognitive rigor matrix would increase student engagement in a fifth-grade classroom. I was able to come to several conclusions from this study. I found that the intervention positively affected student engagement, student academic performance increased, and student/teacher conferences provided important student information.

My research demonstrated a positive relationship between implementing independent learning contracts and student engagement. Student engagement increased during the independent learning-contract intervention in both the small-group reading instruction block and other academic subjects throughout the day. While student engagement did increase over the course of the study, I cannot come to the definitive conclusion that increased student engagement

would be sustained throughout the school year. My students may have been more engaged

simply because it was a new activity and routine that was introduced.

The data from this study showed my fifth-grade students achieved academic growth in

their reading skills over the course of the study. The results from the pre-assessment and post-

assessment indicate my students improved in the areas of cause and effect, problem and solution,

and sequencing. Although students did improve academically over the course of the study, I

cannot conclude that independent-learning contracts were the only contributing factor to their

academic growth. Further research will need to be done to determine whether or not other factors

such as whole-group instruction or other reading interventions were a factor in the results.

Student/teacher conferences were essential for personalizing each student's learning

contract to meet their specific needs. These meetings allowed me to observe the types of

assignments students were completing and assess whether the students were truly engaged in

their work. I was able to have conversations regarding students' specific interests and adjust their

learning contract accordingly. I was able to gather valuable qualitative information from these

meetings that I used to adjust my instruction for the remainder of the school year.

The results from the Student Data Gathering Tool showed that students overall had

neutral feelings towards the independent-learning contracts, yet the majority agreed I should

implement independent learning-contracts with future classes. In order to increase student

excitement towards independent learning-contracts, I would need to continue to meet with

students regularly to personalize their contracts to individual wants and interests.

The information gathered from this research will impact my teaching moving forward. I

believe there are many benefits from the implementation of independent learning-contracts in a

fifth grade classroom and I intend on continuing the use of independent-learning contracts in my

classroom. The independent learning-contracts allow for students to take ownership of their learning by choosing which tasks and assignments they are going to complete. I believe independent learning-contracts will help increase engagement in students who have difficulties working independently. My students will always have something to do, so students will be engaged in their learning more often.

Furthermore, I learned a significant amount of information from the one-on-one teacher/student conferences and will continue having these conferences with future classes. I would like to implement conferences early on in the year with my students to quickly learn important information such as student learning preferences and interests. I can use this information to adjust my whole-group instruction to meet the needs of the majority of my students. I also can use the information given to determine what small-group interventions I need to provide for further personalized instruction. . After completing my research, I believe there are many areas for continued investigation. While I focused my independent learning-contracts on reading activities, further research would need to be done to determine whether or not a math independent-learning contract intervention would have similar results.

The students who participated in this study were at or above-grade level in the areas of mathematics and reading. Most likely, I will be instructing a variety of learners in the future.I am interested to see if the independent-learning contract intervention would be successful in increasing student-engagement if implemented with students who were struggling academically.If students who are struggling academically are more engaged throughout the school day, would their academic performance increase as well?

Additionally, this intervention took place over a three-week period. While the initial findings show that student engagement increased during the implementation of independent-

learning contracts, I would like to continue this study over a longer period of time. I would use

that study to determine whether or not student engagement would continue throughout the school

year or if students would become less engaged over time.

References

Agarwal, P. K. (2011). Examining the relationship between fact learning and higher order

learning via retrieval practice (Order No. 3468823). Available from ProQuest

Dissertations & Theses Global; ProQuest Education Journals. (889092176). Retrieved

from

http://pearl.stkate.edu/login?url=http://search.proquest.com/docview/889092176?account

id=26879

Allen, J. K., Robbins, M. A., Payne, Y. D., , & Brown, K. B., (2016).

Using enrichment clusters to address the needs of culturally and linguistically diverse

learners. *Gifted Child Today, 39*(2), 84-97. Retrieved from

http://search.proquest.com.pearl.stkate.edu/education/docview/1784444734/15D2E501E5

1E4C58PQ/8?accountid=26879

Baker, A.H., (2014) An exploratory critical study of questioning strategies posed by early

childhood teachers during literacy blocks. Retrieved from

http://pearl.stkate.edu/docview/1612495386?accountid=26879

Beecher, M., & Sweeny, S. M. (2008). Closing the achievement gap with curriculum enrichment

and differentiation: One school's story. *Journal of Advanced Academics, 19*(3),

502-530,551,554. Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/222

747656?accountid=26879

Boyer, N. R. (2003). The learning contract process: Scaffolds for building social,

self-directed learning. *Quarterly Review of Distance Education, 4*(4), 369-383. Retrieved

from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/231
182764?accountid=26879

Churches, A. (2008). Bloom's taxonomy blooms digitally. Retrieved from

http://teachnology.pbworks.com/f/Bloom%5C's+Taxonomy+Blooms+Digitally.pdf

Eckstein, M. (2009). Enrichment 2.0: Gifted and talented education for the 21st century.*Gifted
Child Today, 32*(1), 59-63. Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/203
261158?accountid=26879

Gentry, M., Moran, C., & Reis, S. M. (1999). Expanding enrichment program opportunities to all
students: The story of one school. *Gifted Child Today Magazine, 22*(4), 36. Retrieved
from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/203
254674?accountid=26879

Hess, K, Carlock, D., Jone, B., & Walkup, J.R. (2009a). Cognitive Rigor: Blending the strengths
of Bloom's Taxonomy and Webb's Depth of Knowledge to enhance classroom-level
processes. Retrieved from

http://files.eric.ed.gov/fulltext/ED517804.pdf

Hess, K, Carlock, D., Jone, B., & Walkup, J.R. (2009b).What exactly do "fewer, clearer, and
higher standards" really look like in the classroom? Using a cognitive rigor matrix to
analyze curriculum, plan lessons, and implement assessment Retrieved from

http://www.lissapijanowski.com/uploads/1/0/0/2/10025547/hessarticle.pdf

Holmes, V. (2012). Depth of teachers' knowledge: Frameworks for teachers' knowledge of
mathematics. *Journal of STEM Education : Innovations and Research, 13*(1), 55-71.

Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/993

173509?accountid=26879

Lee, N., & Horsfall, B. (2010). Accelerated learning: A study of faculty and student experiences.

Innovative Higher Education, 35(3), 191-202. Retrieved from

doi:http://dx.doi.org.pearl.stkate.edu/10.1007/s10755-010-9141-0

McAdamis, S. (2000). A district-wide plan for acceleration and enrichment. *Gifted Child Today,*

23(3), 20. Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/203

255819?accountid=26879

Mincemoyer, C. (2002). 4-H school enrichment: A school and community partnership. *School*

Community Journal, 12(1), 107-116. Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/195

463016?accountid=26879

Olenchak, F. R. (2001). Lessons learned from gifted children about differentiation. *The Teacher*

Educator, 36(3), 185. Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/220

625291?accountid=26879

Reis, S. M., Eckert, R. D., McCoach, D. B., Jacobs, J. K., & Coyne, M. (2008). Using

enrichment reading practices to increase reading fluency, comprehension, and attitudes.

The Journal of Educational Research, 101(5), 299-314,320. Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/204

202825?accountid=26879

Renzulli, J. S., & Reis, S. M. (1998). Talent development through curriculum differentiation.

National Association of Secondary School Principals.NASSP Bulletin, 82(595), 61-74.

Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/216

039389?accountid=26879

Stephenson, J. & Laycock, J. (2005). Teaching and learning in higher education. Retrieved from

https://books.google.com/books?hl=en&lr=&id=ZKdiGGMwJdMC&oi=fnd&pg=PP2&d

q=learning+contracts&ots=inTxWlqh7d&sig=7NhSWFq1ptnbq5Dqtjm3yMNiS-A#v=on

epage&q=learning%20contracts&f=false

Tieso, C. (2004). Through the looking glass: One school's reflections on

differentiation. *Gifted Child Today, 27*(4), 58-62. Retrieved from

http://pearl.stkate.edu/login?url=http://search.proquest.com.pearl.stkate.edu/docview/203

256858?accountid=26879

Yeng, W. F. (2005). Conceptions of enrichment. Retrieved from

https://nrich.maths.org/content/id/2719/Concepts%20of%20Enrichment.doc

Appendix A: Pre-Assessment/Post-Assessment Data Recording Sheet

Pre/Post Test Student Objective:_____

Student Name	Pretest Score	Post Test Score	Gain +/-

Appendix B: On-Task Observation Sheet

Date	
Time of Observation	
Academic Subject	
Setting: (Are students working independently, at their desks, whole group, etc)	
Observer	

Total students being observed	
Total students on task	
Special Notes	

Appendix C: Learning Contract Assignment Tracker/Teacher-Conference Tracker

Date	Student Name	Assignments Complete/Notes	Conference Notes

Appendix D: Student Data Gathering Tool

From a Scale of 1-10, what are your overall feelings towards learning contracts?

	1	2	3	4	5	6	7	8	9	10	
I did not enjoy learning contracts	○	○	○	○	○	○	○	○	○	○	I really enjoyed learning contracts!

From a scale of 1-5, how challenging was your learning contract?

	1	2	3	4	5	
My learning contract assignments were too easy.	○	○	○	○	○	My learning contract questions were too challenging!

Was the amount of assignments expected reasonable?

○ Yes

○ No

Were one-on-one conferences with Ms. Carlson helpful?

○ Yes

○ No

○ Neutral

Should Ms. Carlson complete learning contracts with her future classes?
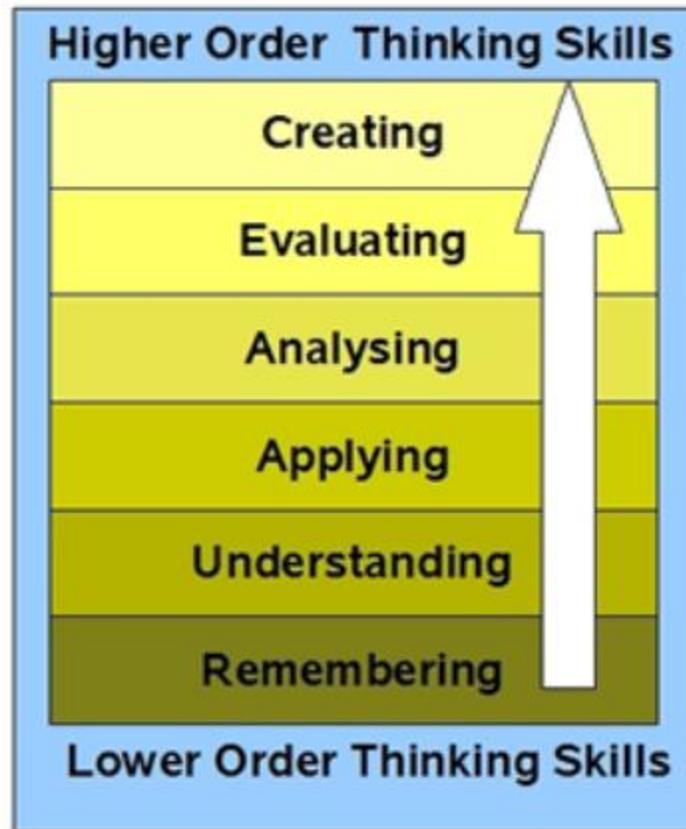
○ Yes

○ No

○ Neutral

What could Ms. Carlson do to improve learning contracts for next year?

Your answer

SUBMIT

Appendix E: Bloom's Taxonomy (Churches, 2008)

Appendix F: Webb's Depth of Knowledge (Baker, 2014)

Level One Activities	Level Two Activities	Level Three Activities	Level Four Activities
Recall elements and details of story structure, such as sequence of events, character, plot and setting.	Identify and summarize the major events in a narrative.	Support ideas with details and examples.	Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/solutions.
Conduct basic mathematical calculations.	Use context cues to identify the meaning of unfamiliar words.	Use voice appropriate to the purpose and audience.	Apply mathematical model to illuminate a problem or situation.
Label locations on a map.	Solve routine multiple-step problems.	Identify research questions and design investigations for a scientific problem.	Analyze and synthesize information from multiple sources.
Represent in words or diagrams a scientific concept or relationship.	Describe the cause/effect of a particular event.	Develop a scientific model for a complex situation.	Describe and illustrate how common themes are found across texts from different cultures.
Perform routine procedures like measuring length or using punctuation marks correctly.	Identify patterns in events or behavior.	Determine the author's purpose and describe how it affects the interpretation of a reading selection.	Design a mathematical model to inform and solve a practical or abstract situation.
Describe the features of a place or people.	Formulate a routine problem given data and conditions.	Apply a concept in other contexts.	
	Organize, represent and interpret data.		

Appendix G: Hess' Cognitive Rigor Matrix (Hess et al., 2009a)

| | Webb's Depth-of-Knowledge Levels | | | |
Revised Bloom's Taxonomy levels	Level 1 Recall and Reproduction	Level 2 Skills and Concepts	Level 3 Strategic Thinking/ Reasoning	Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	Recall, recognize, locate basic facts, ideas, principles Recall or identify conversions: between units of measure Identify facts/details in texts			
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, compare/contrast, match like ideas, explain, construct models	Compose/decompose numbers Evaluate an expression Locate points on a grid Symbolize math relationships Write simple sentences Describe/explain how or why	Specify and explain relationships Give non-examples/examples Make and record observations Summarize results, concepts, ideas Infer or predict from data or texts Identify main ideas	Explain, generalize, or connect ideas using supporting evidence Explain phenomena in terms of concepts Write full composition to meet specific purpose Identify themes	Explain how concepts or ideas specifically relate to other content domains or concepts Develop generalizations of the results obtained or strategies used and apply them to new problem situations
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task	Follow simple/routine procedures Solve a one-step problem Calculate, measure, apply a rule Apply an algorithm or formula Represent in words or diagrams a concept or relationship Apply rules or use resources to edit spelling and grammar	Select a procedure according to task needed and perform it Solve routine problem applying multiple concepts or decision points Retrieve information from a graph and use it solve a multi-step problem Use models to represent concepts Write paragraph using appropriate organization, text structure	Use concepts to solve non-routine problems Design investigation for a specific purpose or research question Conduct a designed investigation Use reasoning, planning, and evidence Revise final draft for meaning or progression of ideas	Select or devise an approach among many alternatives to solve a novel problem Conduct a project that specifies a problem, identifies solution paths, solves the problem, and reports results Illustrate how multiple themes (historical, geographic, social) may be interrelated
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias or point of view)	Retrieve information from a table or graph to answer a question Identify or locate specific information contained in maps, charts, tables, graphs, or diagrams	Categorize, classify materials Compare/ contrast figures or data Select appropriate display data Extend a pattern Identify use of literary devices Identify text structure of paragraph	Compare information within or across data sets or texts Analyze and draw conclusions Generalize a pattern Organize/interpret data Analyze author's craft or viewpoint	Analyze multiple sources of evidence or multiple works by the same author, or across genres Analyze complex/abstract themes Gather, analyze, and organize information Analyze discourse styles
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique			Cite evidence and develop a logical argument for concepts Describe, compare, and contrast solution methods Verify reasonableness of results Justify conclusions made	Gather, analyze, and evaluate relevancy and accuracy Draw and justify conclusions Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, construct, produce	Brainstorm ideas, concepts, or perspectives related to a topic or concept	Generate conjectures or hypotheses based on observations or prior knowledge	Synthesize information within one source or text Formulate an original problem Develop a complex model for a given situation	Synthesize information across multiple sources or texts Design a model to inform and solve a real-world, complex, or abstract situations