Studies in Teaching
2019 Research Digest

Action Research Projects
Presented at Annual Research Forum

Department of Education

Winston-Salem, NC
June 27, 2019

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Studies in Teaching – 2019 Research Digest
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How Does Student Goal Setting Affect Motivation to Learn?

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June 2019

When becoming aware of students who lack motivation, it is the educator's responsibility to help motivate those students. An educator's job should be to help the less-motivated student develop goals that connect personal interests and learning. To help motivate students, the educator must understand what drives them. "Research shows that teachers and educators should investigate the relationship between congruent future goals and achievement goal orientations, by linking the two important constructs in a heuristic and meaningful way" (Lee, McInerney, Liem, & Ortiga, 2010, p. 275). Seijts & Latham (2001) believe the use of proper goal setting can impact student performance. Locke and Latham (1990) add, "Historically, goal setting has been considered one of the most effective psychological strategies for improving performance" (p. 220). As a result, goal setting has made its way into K-12 classrooms and made an impression on many teachers. In this study, the student teachers' purpose is to use stratified goal setting to help students understand what motivates them and to teach them how to use that motivation to improve their learning habits.

Literature Review

For many years, goal-setting has been accepted as a practical technique to increase and direct motivation in achievement-oriented fields like business, education, and sports (Burton, 1989). Over the last thirty years, goal setting theory has developed into one of the most successful strategies used in enhancing performance in the workplace (Baghurst, Tapps, & Kensinger, 2015). Effective teachers have lesson plans that give students their assignments with learning goals and provide students the opportunity to practice new skills (GreatSchools Staff, 2018). Similarly, Rothkopf and Billington (1979) suggest that *students* with set learning goals pay more attention and learn more from goal-setting activities than students with no set goals. However, goal setting will only impact performance if the performer is committed to the goal (Hardy, Jones, & Gould, 1996).

Goal setting has the potential to increase goal commitment as long as the person trying to attain the goal thinks it is reasonable and the goal is presented to them in a supportive way (Locke & Latham, 1990). It is important to note that teachers can set the tone and play a key role in meeting student needs and supporting their academic motivation (Jackson & Davis, 2000). Motivation may come from inside an individual but also from the social environment, which includes the relationship with teachers (Baghurst et al., 2015). Baghurst et al. (2015) also note that when implementing a goal-setting assignment, it is important for the educator to allow students to make their own goals because this can help students take personal ownership of them.

The student-teacher relationship is important in the conversation because when a student is not doing what is needed to reach their goals, the teacher must be able to give critical feedback with little to no resistance. Goal setting success depends on feedback because it is a crucial factor when things are not going as planned (Burton & Weiss, 2008). Teachers can show high expectations by presenting clear standards for success, making learning goals plain to students, demanding effort, and acknowledging appropriate levels of behavior and cooperation (Adkins-Coleman, 2010). Students will only give the effort expected of them, and educators must use their relationships with students to push and motivate students toward effective goal setting.

Methods

This study investigates stratified goal setting and the effect it has on students' motivation to learn. This study took place during the spring semester at a diverse middle school located in the southeastern United States. The research setting was in a classroom that was used to host an after-school group of middle school boys organized by a teacher at the school. The group consisted of eleven boys, whose participation in this study was completely voluntary. Many of the students were invited to participate in the program, entitled Boys to Men, as a result of past behavioral issues, academic concerns, or both.

As an assignment, the student teacher was required to complete a service learning project at the assigned school. Service learning is developing and providing service to a community and/or school based on a specific need. The service learning project completed by the student teacher was named Unappreciated Staff Appreciation Day (U.S.A.D) by student participants. U.S.A.D was a day for participating students to publicly show appreciation to a staff member of their choice by delivering personalized cards. Students selected six teachers, one lunch provider, two counselors, and two administrators to participate. The organization of the service learning

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ideas was to motivate the participating students enough to drive them to develop their own stratified end-of-project goal. The end goal was expected to be academic, athletic, or personal. With their own stratified end goals in mind, the students then developed a plan of action that most effectively helped them reach their goals while meeting the requirements of the service learning project.

Data collection methods included pre- and post-questionnaires, a weekly motivation scale worksheet, student writing, and researcher field notes. The pre- and post- questionnaire was aimed to measure student participants' motivation in school, motivation out of school, and general motivation. The weekly motivation scale worksheet helped students recognize when they were motivated and where their motivation came from. The student teacher collected student writing, which included assignments such as goal charts and responses to the relevant writing prompts and documented field notes about class discussions and journal entries to refer to during data analysis. The teacher researcher used constant comparative analysis when coding the accumulated data, which involved open, axial and selective coding (Corbin & Strauss, 1990). Of the participating students, only four of them completed a pre-questionnaire in its entirety, which means there were a total of four participants with complete data sets discussed in this study.

Results

At the end of the research study, the data support a 32-point increase in student motivation. Of the individual motivation groups, motivation inside school increased by 10 points, motivation out of school increased by 9 points, and general motivation was increased by 13 points. The total score of the four pre-questionnaires graded out at 103 of 192 possible points, which is around 53.64 percent. The post-questionnaire increased to 135 of 192 possible points, which is around 70.31 percent. In comparison to the pre-questionnaire, student participants were more motivated by the end of the study and as a result of the service learning project.

Specifically, Student A showed an increase of 20.83 percent; Student B showed a 10.43 percent increase in motivation over the course of the study; Student C showed the most improvement with a 29.16 percent increase in motivation; and Student D showed a 27 percent increase. Evidence from the research study indicates that one hundred percent of participating students increased their motivation to learn.

Discussion

Overall, when participating students were first instructed to think of main goals, they immediately turned to sports-related goals or goals that correlated to the Hollywood lifestyle. Prior to setting any goals with the participating students, the student teacher informed them about the proper use of goal setting and the importance of it. In the third meeting, students were asked to verbally explain the definition of a goal. A student hesitantly responded, "A goal is making a plan to do something and then doing whatever to do it." Although this is not the full definition of a goal, the student teacher emphasized the word "plan." As a teacher makes a lesson plan to attain a goal, a student should have the same plan for themselves.

Goal achievement and goal setting are both important topics that go hand-in-hand with successful teaching (Locke & Latham, 2002). Research indicates that educators should set goals every year as a way to motivate themselves as well as their students (Baghurst et al., 2015). Just as educators use planning to properly set goals, the student teacher used this research process to make sure his students did the same. Participating students confirmed that the proper use of goal setting and using goals to drive motivation made it easier to stay on task. Student A said, "I learned that sometimes you just have to fudge the squad and do what's right," when elaborating on how his goal motivated him to learn better ways to avoid trouble in school. Baghurst et al. (2015) would applaud this comment because, as they stated, "First, goals serve a direct function in that they guide attention toward goal-relevant activities and away from goal-irrelevant activities" (p. 29).

It was essential for the student teacher to gain an understanding of where the passion for each goal originated. To gain this better understanding, the student teacher made it a priority to develop a deeper relationship with the student participants. After trust and a deeper relationship was developed, it became easy to have those deeper conversations about the passion and purpose that drives students' goals. The success of the research project was dependent upon the student-teacher relationship, because it opened the door for honesty, accountability, and constructive feedback. The relationships that developed between the student teacher and participating students helped to create opportunities for honest accountability and constructive feedback.

In the future, instead of just asking students to complete a journal writing activity, teachers may consider making it a creative goal poster that requires students to identify and articulate their goals regularly. Developing a goal poster that students can use throughout a

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designated time period to keep track of their accomplishments would be a creative way to allow students to engage with their goals on a daily basis. Although the student teacher did not use this activity, it could act as an important source of data and a more effective way to help students achieve their goals.

In reference to goal setting, having constant conversations about motivation as well as a visual of the goal-setting plan is important. In this study, the participating students did not have their visual plans handy at all times, which made it easy for them to lose focus. More time could provide a stronger relationship with student participants, which might result in increased student accountability. Greater accountability, on the other hand, could decrease the constant conversation of refocusing on set goals. A second solution to the limited amount of time is to provide student participants with a copy of their goals and a plan to reach those goals. Having a visual to constantly remind student participants about their goals can provide accountability and motivation because it gives a daily reminder that is essential to goal setting.

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Combatting Confirmation Bias:
How Writing from Opposing Perspectives Affects Understanding of Issues

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In an era with uninterrupted access to information, consumers of media should, in theory, be presented with a wide range of views on an issue allowing for a holistic and objective perspective. Multiple media sources, both professional and amateur, compete for ideological real estate and continually bombard consumers with a 24-hour news cycle. As a result, creating a critical and nuanced opinion of an issue is becoming more challenging than ever. A Pew Research Center (2017) study suggests the gap between partisan political values continues to widen as groups are finding less middle ground on issues. Access to information can thus be seen as a double-edged sword, allowing individuals to surround themselves exclusively with information they agree with and to completely sequester themselves from considering the opposing point of view. Ultimately, this sequestration can lead to an ideological polarization that may become more prominent in a charged political climate. This ideological polarization can find its way into the classroom as students are exposed to political discourse at younger ages through both traditional forms of media as well as an ever-increasing influence of social media.

Giving students the skills necessary to consider the other side of an argument will better prepare them to navigate a world that is increasingly lobbying for their attention. Breaking out of a state of confirmation bias and into a mindset that considers opposing viewpoints is essential to the notion of critical thinking, as it truly embodies the critical nature of the practice. Creating a culture in which opposing viewpoints are not only tolerated but also examined and explored may be the beginning to bridging ideological divides. As such, this study looks to answer the following research question: How does writing from an opposing viewpoint affect students' understanding of a chosen topic?

Literature Review

Simply put, confirmation bias occurs when individuals seek out information to confirm their preconceived notions (Taber & Lodge, 2006). Taber and Lodge (2006) specifically look at how confirmation bias plays out in sociopolitical issues. The researchers' results drew parallels to previous studies on confirmation bias as they found the stronger the subject's prior attitude was toward the topic, the less critical they were of sources that confirmed their opinion. Likewise, the more likely people were to avoid research and data that went against their opinion.

With the multitude of research establishing the existence of an inherent confirmation bias, this begs the question of what should be done about it. The concept of critical literacy aims to combat confirmation bias by breaking the mold of traditional instruction in the classroom to force students to interact with ideas they may be uncomfortable with. Critical literacy can be boiled down to four main components defined by Lewison, Flint, and Van Sluys (2002) as "disrupting the commonplace, interrogating multiple viewpoints, focusing on sociopolitical issues, and taking action and promoting social justice" (p. 382).

It is clear that when students come into the classroom, they may already have their minds made up on a number of issues and topics. They are, after all, complex individuals with diverse backgrounds and experiences. The relatively recent addition of social media, however, has added a new level of complexity to how people form ideas. Not only are these platforms designed to surround users with content that supports their own views (Sunstein, 2017), but young people in particular are becoming increasingly reliant on these platforms as they look to them for affirmation of their identities (Twenge, 2017). As a potential solution, the critical literacy framework tasks students with interrogating multiple viewpoints (Lewison et al., 2002), among other elements, that encourage students to consider underrepresented voices and viewpoints.

Methods

This study took place at a large, suburban high school in the southeastern United States. The research was conducted during the researcher's student teaching internship between January and May in the spring of 2019. The research setting was one honors-level English Language Arts II class, made up of 10th grade students, in which students were given the opportunity to self-select to participate in the study. The class consisted of twenty-six students, thirteen of whom returned the necessary consent and assent forms in order to participate.

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Students completed the research paper assignment over the course of two and a half weeks during a unit on research strategies and MLA formatting. At the beginning of the study, students were introduced to the assignment and given a number of suggested topics for them to examine further. The only qualification for a topic was it must have two or more clearly defined sides. Students were given time to research topics, discuss topics with peers and the researcher, and explore sources about their topic. Students were then informed they would be completing the remainder of the research assignment without arguing from their own perspective but rather from the opposing viewpoint.

Over the course of this study, the researcher collected and analyzed data from a number of sources, including pre- and post- intervention questionnaires, student writing, and researcher field notes. To analyze these data, the researcher made profiles of each student. These profiles included data from student responses to pre- and post-questionnaires as well as student work samples. In order to compare responses from Likert scales, the researcher made a table. The Y-axis contained the question students were responding to while the X-axis contained students' numerical response from pre-and post-Likert scales. Creating this table involved looking at each students' work individually in order to address the research question.

Results

Of the thirteen participants in the study, ten unique topics were represented. These topics included nationalized healthcare, abortion, physician-assisted suicide, payment to NCAA student athletes, veganism, mandatory vaccinations, social media, standardized testing, legal drinking age, and gay marriage.

Regardless of the topic that each individual student selected, every student in the study chose something they both identified as important to them as well as something on which they took a strong stance. These topics can be categorized into two distinct groups: hypothetically formed viewpoints and experientially formed viewpoints.

The nature of some of the topics was hypothetical—students were not necessarily personally affected by the topic. However, these students noted a certain amount of situational empathy. For instance, one student writing on the topic of abortion remarked:

> I also am a woman and would want to do what I wanted with my body if I were pregnant and I didn't want the baby. I can also imagine myself in the situation as one of the women in this unfortunate circumstance. (Student A)

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While Student A was not directly impacted by abortion policies, she was looking to put herself into the perspective of someone in the situation. Though students in this group were personally removed from their topic of choice, outside forms of influence such as social media, relatives, and peers did shape the way they constructed their initial stance on the topic.

Other topics, however, directly impacted students' day-to-day lives. Much of their motivation for choosing the topic and expressing their chosen viewpoint stemmed from personal experience. For example, Student C discussed in her pre-questionnaire the harmful effects of social media on adolescence. Drawing from her own experiences, she expressed, "I am too addicted to my phone but the reason I am is because of social media in general… It's been taking over kids and taking time away from their lives, along with cyberbullying becoming something that has grown" (Student C). Student C opted to explore an issue with direct relevance to her life and something she experienced on a daily basis. She had seen first-hand the impact that social media was having on her and her peers. From this conclusion she decided that social media, in general, was a net negative.

While 83% of students replied "Yes" to seeing legitimacy in the viewpoint that opposed their own in the pre-questionnaire, results pertaining to how writing from the opposing viewpoint changed students' understanding of their topics following the intervention were mixed. In total, seven students said that writing from the opposing viewpoint changed how they understood the issue. One student writing on the topic of physician-assisted suicide said, "It has not changed my opinion [of the topic], [but] I know more information on the topic now" (Student E). For Student E, understanding of the topic was increased from a holistic perspective. He explicitly noted not changing his perspective on the topic but understood the overall topic better.

Other students had similar experiences, citing that in the research process they were exposed to other aspects of a topic about which they initially had made up their mind. "While I don't like writing what I don't believe, I can understand parts of peoples [*sic*] opinions on pro-life" (Student G). Similar to Student E, Student G did not change her mind when it came to the topic of abortion. However, researching and being introduced to the opposing viewpoint gave the student greater understanding of the topic.

Of the thirteen participants, six students answered "No" to the question asking if writing from the opposing viewpoint changed how they understood the topic. "A lot of the 'facts' from the opposite side were disproven with my research which strengthens my views," Student B

stated. Many students also noted that arguments from their initial point of view outweigh arguments they found when writing from the opposing point of view. Student I wrote on her post-questionnaire, "The points are weak and I think there are so many more pros than cons about being vegan" (Student I).

Despite a wide range of student-selected topics and viewpoints on those topics, many students shared similar experiences throughout the study. When asked to describe their experience writing from the opposing viewpoint, many students suggested they found it challenging—some to the point where they struggled to perform the writing assignment. However, many students saw this assignment as an opportunity to view the issue more holistically. One student said, "It's definitely been eye opening to do research on the opposing side. It definitely changed my mind on some points but also strengthened some of my opinions" (Student K).

Discussion

Classrooms are made up of diverse groups of students with varying backgrounds, viewpoints, and levels of understanding. That being said, fully understanding a topic can mean something different to different students. This study looked to give students a more holistic approach to researching their selected topic by having them write from the opposing perspective.

Due to the considerable level of student autonomy given toward topic selection, it was expected that a number of unique topics would be chosen by students. The only qualification for topic selection was that the topic should have two or more sides to the issue. Students seemed to be drawn toward contentious topics and did not shy away from expressing their viewpoints on important issues. Naturally, this project led to constructive discussions among students as they began constructing arguments and writing their papers.

For this study to receive truly candid results, it was essential that students had the freedom to choose the topic they wished to approach. One aim of the study was to get to the crux of how students formed their viewpoints and how they would react when they were forced to reconsider them. To explore this reaction fully, students needed to be given the ability to explore their interests and issues on which they had prior knowledge.

When faced with the opposing viewpoint, many students initially put up barriers as they approached their topic. This idea of students rejecting the opposing viewpoint is well reflected in the literature addressing the idea of confirmation bias and motivated reasoning (Felton,

Crowell, & Liu, 2015; Taber & Lodge, 2006). While every student underwent the same process of exploring the opposing viewpoint, those who held stronger stances on their viewpoint prior to intervention were more likely to confirm these same viewpoints following the study. This opens up an area for future research into the topic of effective methods for engaging students with strongly held beliefs to consider opposing perspectives.

Having students recognize their own viewpoint, how they formed that viewpoint, and getting to the core of why someone might have a differing viewpoint is essential when approaching issues that can be regarded as contentious. Some teachers struggle when approaching contentious topics—sometimes to the point where they disregard them entirely and avoid addressing issues that may offend or cause division in the classroom. This type of assignment shifts the responsibility of critical literacy from teacher to student, as students become responsible for supporting their own ideas with evidence while considering viewpoints other than their own.

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Impact of Primary Source Activities on Student Understanding, Engagement, and Interest

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June 2019

As pointed out by Reisman (2015), it is difficult for students to grasp primary sources in the ways we predict. The biggest hurdle is that students often lack a commensurate level of background knowledge to engage with these documents--knowledge that high school teachers often take for granted. Worries about the ability of students to understand the nuances of primary documents--or if they know what a primary source is in the first place--pervade even the most ardent champions of the "Thinking Like a Historian" method (Reisman, 2012). This research study examines how the use of activities using primary sources impacts student engagement within the classroom and interest in social studies while connecting bridges to understanding material through ability to close read.

Literature Review

The current study examines how the incorporation of primary sources through activities impacts student understanding of history and impacts engagement. Social studies education prepares students for "democratic decision-making" by emphasizing "skills and practices," (NCSS, 2013, p. 3), but if students do not feel authentically engaged in the classroom, then interest levels can remain low, and social studies courses becomes obsolete (Carter, 2017).

Martell and Hashimoto-Martell (2011) examined what happened to students' perceptions of content when the class did not use a traditional textbook. The standard textbook was replaced with a reading packet that incorporated primary source material. While there were a few students who did not enjoy the change from a textbook-centered classroom to primarily using primary sources, the positive impact this transition to primary sources had was overwhelming as more students had increased motivation and engagement in activities. Students were cognizant of activities that were authentic and those that were designed to keep students occupied.

Reframing the narrative for the social studies classroom to be more encompassing was successful for Martell and Hashimito-Martell (2011), and has been proven by others, especially

for students identified as members of underrepresented groups (Dan, Todd, & Lan, 2010; Mirci, Loomis, & Hensley, 2011). Latino and Black students recognized that their communities have minimal time devoted in textbooks (Woodson, 2015; Salinas & Alarcon, 2016). In American History II, study of American from 1877 to the present, contributions of African Americans appear sporadically during the Great Migration, Harlem Renaissance, and Civil Rights. Latino history is mentioned even less, as state standards barely make mention of these contributions and narratives (NCSCS, 2011). When students can see themselves in history, students are generally much more interested in the material (Reisman, 2012).

Methods

This study took place in a suburban public high school located outside of a mid-sized city in the southeastern United States during the spring semester of 2019. The classroom was a Standard American History II with 22 students participating out of 31. This research took place over six consecutive instructional days, 90 minutes each, that featured 1950s culture, Great Society, the Warren Court, and the Civil Rights Movement content.

On day one, students took a pre-questionnaire that consisted of free response questions. The questions asked students to consider their engagement in the classroom, interest in social studies if they knew what a primary source was and could define it, if there was a primary source overused, and if there were voices or backgrounds they would like to hear more from during social studies. The pre-questionnaire was completed at the beginning of the class period and students had unlimited time to complete the questionnaire.

 On day three, students completed a gallery walk about Civil Rights with a scaffolding sheet that was collected. Students engaged with ten quotes from primary sources relating to the Civil Rights Movement while recording their opinion of the speaker is for or against the Civil Rights Movement.

On the fifth day, eight students participated in focus groups. Each focus group had four students that were pulled out during class instruction. The questions were oriented to understand students' extracurricular interests, how they describe their personality, and their preference of work style. The questions then evolved into their idea of what instruction with primary sources is like, if there are styles of sources they would like to hear from, and then to gauge their interest and engagement in the room. The focus group conversations were recorded and transcribed.

On the sixth day, students took a post-questionnaire. These questions were the same at the pre-questionnaire to track changes in student responses with the addition of a few more questions that asked students for their opinion about the week of instruction. Just like the pre-questionnaire, students completed this at the beginning of class and had unlimited time. Throughout the research, I took observation notes to support the happenings of the classroom and provide context to the data.

Results

While the number of students who could define and describe primary sources increased during the research, there is little association between this knowledge and the ability to close read primary sources. More students were able to define and describe primary sources than the number of students who could successfully close read primary sources. Student engagement numbers increased more than student interest during the research period.

Close Reading and Primary Sources

Of the 22 participants, 19 were present for the pre-questionnaire, and 10 of these participants provided responses that demonstrated knowledge of the definition of primary sources. In the first focus group, students answered, "What comes to mind when you hear that we will work with a primary source?" means they will learn material while working with partners because that was the course structure. In the classroom, students in the second focal group equated primary source analysis with collaboration and activities which could impact their responses.

Of the 18 participants who completed the post-questionnaire, 13 students provided answers that demonstrated their knowledge of primary sources. Of these 13 students who now provided knowledgeable answers on the post-questionnaire, 12 participated in the pre-questionnaire, and five of them had initially provided knowledgeable answers about primary sources. At the conclusion of the study, five students could not answer or describe a primary source.

During the gallery walk, 17 of the 22 participants were present. Nine of the 17 students were able to correctly label all 10 of the Civil Rights leadership quotes as pro-Civil Rights or anti-Civil Rights. Eight incorrectly assigned the same two leaders: James J. Kilpatrick and Rodolof Gonzales. In the classroom, we had not discussed the impact of an authors' speakers' tone on their message. This lack of knowledge interfered with their understanding of the

subjective nature of some quotes. While another quote required a greater ability to close read another quote required comprehension of vocabulary that may be unfamiliar to students and recognition of the poetic structure, its metaphoric structures, and its vocabulary (sterilization, neurosis, etc.), which students had not worked with before in this classroom.

This unfamiliar combination could have been daunting contributing to students reacting with a cursory read which impeded their understanding. Students would perform similarly on assessments with supporting text to read for each question. The block of text was overwhelming, and students would quickly select an answer without reading the material. There are no neutral responses for the gallery walk.

Student Engagement in the Classroom

Of the 22 students participating in the study, 19 were present to complete the pre-questionnaire. Fifteen of the 19 students reported positive feelings of being an active participant in the classroom. Overall with focus groups, seven of the eight students considered themselves engaged and active participants in their social studies classroom. Additionally, students associated time spent with primary sources with engaging group work. Students did not demonstrate anxiety or distaste for primary sources because the classroom structure associated close reading of primary sources with group activities.

Students were expressed excitement about the challenge to place the quote and speaker into the correct category of pro-Civil Rights or anti-Civil Rights. During the gallery walk, students were abuzz with conversation as they traveled around the 10 stations. Meanwhile, I visited each group during the activity to observe group dynamics and to ask probing questions for students who appeared to be struggling or who were at a standstill.

For the post-questionnaire, 18 of the 22 participants were present for the post-questionnaire. Fifteen of the 18 reported that they were active participants in the classroom. Seventeen of the 22 participants were present for both the pre- and post-questionnaire. Of these 17, 14 responded that they were active participants in the pre- and post-questionnaire. Positive participant numbers were higher regarding engagement in the classroom than their measured ability to successfully close read primary sources. Students are more likely to consider themselves engaged in the classroom when they answer questions in front of the class, spend class time completing activities, and spend little time completing bookwork.

Interest in Social Studies

To gauge student interest in social studies, the questionnaires asked students, "How do you feel about social studies?" Student responses were coded as positive, negative, or neutral if they did not provide strong inclination for or against social studies. Of the 19 participants in the pre-questionnaire, eight students gave neutral responses; seven students gave positive responses, and four gave negative responses. On the post-questionnaire, there were 10 neutral responses, five positive responses, and two negative responses. Over the duration of the study the neutral responses about interest increased, the positive responses decreased, and the negative responses also decreased. While student opinion shifted upward from negative or neutral to positive about engagement, most of the students find themselves indifferent about their interest in social studies content. The study included a number of primary source activities that welcomed collaboration, but this strategy did not drastically change student interest in social studies.

Conclusion

The study concludes that even activities that produce low understanding still produce student engagement and sustains student interest in social studies long-term. This also suggests possible unforeseen barriers to student engagement with the nuances of the material that could be the subject of future study. When students engaged with primary sources during this research, they only did so in groups. In both focus groups, students explained they wanted engaging activities in social studies classes, and in all classes, but they were often given bookwork to complete after notes. Notably, students considered the amount they contributed to class conversation and the amount of activities as measurements of how engaged they were. While students may not develop a personal interest in social studies content, students will feel positive about their personal engagement in the social studies classroom if the classroom is structured to allow collaboration and is less dependent on bookwork exercises.

For teachers who want to use primary sources in their classrooms, students respond well to such activities when they are also provided with scaffolding sheets and opportunities to collaborate with others. Providing this structure makes expectations clear and supports the development of interpersonal skills. Intermittently interspersed between activities should be moments of individual check-in between the teacher and students to track student understanding of primary sources and their ability to close read. Collaborative moments among students allow opportunities for students to learn from one another, and the individual check-ins spotlight how future activities can be organized to promote continual student growth. Relying solely on data

from group work can be misleading on student's ability to interact successfully with primary sources and other materials.

After studying how students are engaging in close reading of primary sources, their engagement in the classroom, and interest in social studies, research should be furthered to explore the impact of how increased use of group activities, rather than bookwork, impact student performance of close reading and levels of engagement and interest. When the focus group participants were asked to elaborate on their answers, the common root of their disinterest was from associating social studies classrooms with mounds of bookwork. These bookwork assignments were primarily completed solo with little engaging activity assigned after completion of the bookwork.

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The Effect of Reading Aligned Children's Literature in Kindergarten Mathematics

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June 2019

Introduction

Mathematics is an important and mandatory subject that is taught in schools all over the country. While some students love working with numbers and problem solving, others struggle to understand and can even start to dislike it from a young age. It is important that students are able to connect with the material at a level that is engaging and fun.

By integrating math concepts with an activity that students enjoy, it is expected that successful learning will take place. A potentially effective method of doing this could be a class read-aloud. Classrooms have noted success with gathering students' full attention by reading books aloud (Beck & McKeown, 2001). Hintz and Smith (2013) found that by aligning read-aloud time with math standards and making this a daily activity, students connected more with the material and had fun while doing so. The practice of reading aloud is a very common teacher practice and is most commonly known for its ability to allow children to develop and refine their language, especially at a young age. Stewig (1989) advocates that literature such as picture books represent a variety of topics and interests, are easily available and are educationally sound.

Literature Review

When kindergarten students are introduced to a new mathematical concept, it is imperative that these students be able to connect with the material in a way that makes sense to them. One way of doing this in a kindergarten mathematics classroom is through the use of children's literature. Using related children's literature has been recommended as a way to help teach and reinforce a mathematics concept. One way of incorporating children's literature is through a read-aloud. The act of reading aloud a children's book about a mathematical concept may encourage mathematical thinking.

Reading aloud to students has been a common teacher practice in classrooms for many years. A1994 study (Palmer, Codling & Gambrell) found the memory of reading aloud as a common practice to be motivating. In this study, elementary students were asked what motivated them to read books and the most consistent answer was the fact that their teachers read to the class. This study found that creating a classroom that fosters the love of reading and incorporating reading in general, like a teacher read-aloud, is very important.

Klesius and Griffith (1996) further suggest that the act of reading aloud to children and the experience that they have will increase students' vocabulary development and comprehension growth. They conducted a study of interactive storybook reading with ten kindergarten students who had been identified as students whose language and literacy development was below that of their peers. Results showed that these students were very excited and engaged during these sessions, children were able to make sense of the world around them and successful comprehension took place.

As stated before, the importance of incorporating children's literature into the classroom is not a new concept and is highly encouraged as a good teacher practice. Moyer (2000) suggests that children's literature provides a context where elements of mathematics can be examined. Such elements include mathematical concepts, patterns, problem solving, and real-world contexts. Students reported being able to see the math while the teacher was reading this book aloud to the class. These results suggest that when mathematics is represented in children's literature, it will make sense to children because it illuminates how mathematics is an important part of their everyday life. Moyer was able to use children's literature as a context that was interesting and meaningful for children because it was a familiar structure where they were able to explore mathematical ideas.

Keat and Wilburne (2009) had similar results in their mixed methods study, which was done in a kindergarten classroom. This study examined how literature in the form of storybooks influenced kindergarten children's mathematical achievement and approaches to mathematics learning. In this study children were able to use the children's literature from class to help them with their mathematics. The storybook characters were in a scenario where they were struggling with problems and naturally students used mathematical thinking to help solve the problem in a way that assured both achievement and positive attitudes like the previous study.

Given the background research, the current study will focus on the further description of results of incorporation of children's literature through reading aloud to students in a mathematics classroom. The research addresses the question, "How does aligning children's literature with kindergarten mathematics lessons affect attitude and achievement?"

Methods

This study took place in a kindergarten classroom at a public elementary school in the southeastern United States. All of the students were given informed consent forms for their parents to sign and assent forms for them to sign.

In the week prior to starting the aligned read alouds, all students in the study completed a pre-attitude and achievement assessment and a pre-attitude interview. These assessments were given orally to each student individually. The oral interview was also conducted individually with each student who participated in the study. Mathematics lessons continued in a regular manner. A separate time was specifically designated for the teacher-researcher to read aloud to the students every day. After the completion of the intervention, students completed the same attitude and achievement assessment and attitude interview.

This study measured changes in attitude and achievement. Attitude was assessed by the attitude survey and interview, as well as by observation. The survey contained questions regarding how students felt about math and how they felt about being read to. The interview allowed students to verbally explain in their own words exactly how they felt about mathematics and being read to. The interview went a step further to deepen the understanding of students' attitude and the connections they made between the reading and the math. Achievement was assessed by comparing the results from the pre- and post-achievement assessment, which contained questions regarding the topic of the unit.

Once students had completed all pre- and post- assessments the teacher-researcher collected all of the data on student attitude and achievement. The teacher-researcher thoroughly examined all of the assessments and interviews to see if there are any changes. Once the teacher-researcher had analyzed the data, she looked to see if there were any trends within all of the data that lead towards answering the research question.

Results

In analyzing the data collected over the course of the nine-day intervention period, themes emerged in both student attitude and achievement. According to students' pre and post-

achievement assessments, students continued to achieve at a high level. In regards to attitude, students reported feeling very happy about mathematics and mathematics in children's books.

The pre and post-attitude assessments provided information in regards to how students felt in very simple terms. The majority of students in the sixteen who participated in the study felt happy about the subject of mathematics and felt happy when their teacher read aloud a storybook to them. This stayed consistent from start to finish. The results from the last question also remained consistent from beginning to end, but didn't provide much information to the researcher about how students felt when they heard math in a storybook. As seen before, the majority of students either felt happy or didn't know how they felt.

Both the pre and post-attitude interviews gave the researcher much more information into the thoughts and feelings of the sixteen participants. The majority of students liked mathematics due to the fact that they were able to learn new things. This did not change from the beginning all the way to the end of the study. Students as a whole also liked when their teacher read aloud a storybook to the class because they liked stories. These feelings also did not change from before the intervention or after. In regards to how students felt about math when they heard it in a storybook, results also remained consistent. Students reported feeling happy or good from start to finish. Only two students did not like it or said that they felt bored.

The pre and post-achievement assessments provided information to the researcher about mastery of the standard. Results from the pre-achievement assessment were very high in terms of students answering questions correctly, which meant there was little room for growth. Results from the post-assessment did increase in the amount of students who answered questions correctly. Overall, achievement did increase from before the intervention to the end of the study.

Conclusions

Aligning children's literature with regular mathematics lessons in kindergarten proved to be an effective teaching method, as students showed growth in achievement scores and attitude remained positive in the majority of students. During the intervention period, students looked forward to having a children's book read aloud to them. Students were always very engaged and were able to deeply think throughout the read-alouds.

Students were also able to understand that the children's books had to do with concepts that they were learning about in their regular mathematics lessons. Because students'

engagement levels were so strong during this intervention process, students enjoyed and devoted their attention to the concepts presented in each book.

Student achievement scores also increased from the pre to post-achievement assessments. Although achievement did increase after this intervention there is no way to attribute this success only to the read-aloud that was implemented.

Limitations

After analyzing the data collected from this nine-day intervention, it is clear that there are some limitations in the study. Nine days is a very short amount of time to implement a treatment like a read-aloud, especially if it was not a practice already in place. This treatment happened fairly late in the school year when routines and attitudes had already been formed. It is important to note that read-alouds were done immediately following mathematics instruction. It is unclear if this timing contributed to results in both attitude and achievement. Results were also presented as a whole rather than per student. This could also vary results in both attitude and achievement.

Although it is unclear if any of these factors contributed to the results for both attitude and achievement, it is clear how beneficial this practice can be.

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Making History Matter: How Current Event News Articles Influence
Student Connections to History

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Previous research has shown that students often view studies of current events as more relevant to their own lives than learning history (Martell, 2014). However, there is little research available on how students view the process of learning history when combined with current events studies. Gibson (2012) found that while students were able to clearly articulate what they were learning in social studies classes, they could not give concrete answers as to why they were learning this material. Without valuing the process of learning social studies, students may struggle academically or succumb to ambivalence in their social studies classes. Despite potential barriers to including current events in history classrooms, like a lack of guidance or fear of seeming "political", not including current events may be preventing students from making important connections to history. This study examined how the use of current events studies in the social studies classroom affects students' views on the relevancy of their historical studies and how it affects student engagement in the classroom.

Review of Relevant Literature

In our current political climate, many teachers and principals report unprecedented levels of fear and trauma in their schools due to current national events and a need to create a safe environment for students to learn (Burkett & Hayes, 2018). Since students feel deeply affected by current events (Burkett & Hayes, 2018), history classrooms may provide the perfect space to include current events in the classroom because of the connection between historical events and the modern world. Stockdill (2013) advocates for a social studies curriculum in which teachers clearly show how student's lives and social studies connect, giving added meaning to the content students learn in history class.

In order to accomplish this, teachers should pursue instructional strategies that engage students in the material being taught to maximize student achievement. One method of increasing student engagement involves allowing students to choose topics to write about

themselves, which also allows students freedom in their work and increases engagement and enjoyment of learning (Van Lieu, 2015). When teachers choose topics for students, they must take care to include current events that are relevant to students to maximize the impact of this form of instruction (Haas & McLaughlin, 2000). If successful, research shows that students who develop the ability to apply historical concepts to instances outside of the classroom and apply this knowledge to their own experiences may view their work in the classroom as more meaningful (Alongi, Heddy & Sinatra, 2016). While this research explored how students can benefit from the inclusion of current event news articles into the classroom, no educational benefit is worth emotionally harming a student because of class discussion or investigation.

Walters (2017) argued that given enough exposure to current event news articles, students develop their abilities to understand larger themes between topics and think critically about how news stories affected their lives personally. Similarly, Wright, Shemberger, and Price (2016) found that students who are instructed to have discussion with other students or write stories and articles about news and current events developed a deeper understanding of the event and how it applies to larger concepts than students who are quizzed on facts and nothing more.

Reading, discussing and writing about current events can have meaningful impacts on students outside of the classroom. Interaction with topics and issues affecting our nation and our world can lead to increases in civic engagement, ability to think critically about complex issues and student's abilities to reconsider opinion when faced with facts or alternative viewpoints (Van Camp & Baugh, 2016). However, care must be taken when teaching current events that may trigger harmful emotions in students (Burkett & Hayes, 2018).

Methods

This research was conducted in a high school social studies class in a suburban high school located in the southeastern United States. The sample for the research contained 14 students in the teacher-researcher's honors US History II class. The research used qualitative data collection methods, including pre- and post-questionnaires, focus group interviews, classroom observations and field notes about each class period during the research.

Throughout the entire semester, each class period began with a fifteen to twenty-minute discussion and examination of two to three current event news stories selected by the teacher-researcher. During the unit in which this research was conducted, the discussion of current events was narrowed to one story per day. The selected news story was connected to the

historical topic or an event that would be discussed in that class period, or that students had learned about during the previous class. Over the course of the unit, students took more control of this process by finding current event news articles to discuss. Students were also assigned a project to find a current event news article of their own and connect it to topics that had been discussed in class to demonstrate their understanding in essay form.

Students were given both a pre- and post-questionnaire that asked their views on the relevancy of historical learning to their lives and whether the current events comparison study altered their view. Data were also collected through focus group interviews conducted by the researcher outside of normal class periods. During and after each class period, the teacher-researcher made note of changes in student engagement relative to class periods before the intervention when connections between current events and history were not discussed.

Student responses to the pre- and post-questionnaires were analyzed to find emerging patterns about the relevancy of learning history to students. These responses were then classified as a positive, negative or neutral opinion on each question. The teacher-researcher also made note of student engagement each day during the intervention, judging each day on a simple scale of 1 (students are very disengaged) to 5 (students are very engaged).

Results

Data analysis of student questionnaires revealed that most students believed that American history is relevant to their lives. When asked whether history was personally relevant, 13 of the 14 students questioned responded that it was while no student held a negative view that history was not relevant to their lives. Similarly, when asked whether current events are related to topics discussed in history, 13 of 14 students responded positively. The same number believed that history and current events are equally important to learn. Students were also asked whether the specific news articles used to compare current events to history in class were relevant to their lives. Twelve respondents had positive responses to this question, while two students had neutral opinions.

Examination of answers across questionnaires revealed that four students who had viewed history as not relevant or only somewhat relevant to their lives on the pre-questionnaire replied differently on the post-questionnaire. The number of respondents who stated they enjoyed learning about history increased from ten to twelve from the first to second

questionnaire. In keeping with this pattern, three more students believed current events are related to history by the end of the intervention.

Six student volunteers participated in focus group interviews about their views on using current events in the classroom. From these students, responses in the questionnaires had shown diverse opinion about their enjoyment of history and the relevance of learning history to their lives. Student responses to questioning during the focus group indicated that learning history became more relevant to them because they made connections to the news that was discussed.

During the initial days of the research, as the teacher-researcher modeled making connections between historical topics and a selected current event news article, student engagement was very high. On three days of the first week of this research, student engagement was rated as a 5 (very engaged). In these class periods, students were very enthusiastic about finding a current event news article of their own to share with the class during the time allowed. However, during the second week of the current event study (days 6-10), student engagement ratings were below the first week average. Students found more stories that were similar to or in some cases simply extensions of stories that had been shared earlier in the unit. When prompted to find new stories that focused on unexplored issues, the teacher-researcher met increasing levels of student frustration and lower levels of engagement.

Students' responses on questionnaires claim that a higher level of engagement existed in this history class compared to other classes where current events news analysis was not part of normal class routine and to situations during this semester where this class did not begin with news discussion. Multiple students indicated that discussing current events in the classroom generated a curiosity about stories from both the present and the past.

In field notes during these class periods, the teacher-researcher noted less enthusiasm about the writing assignment than discussions and connections made in class. Multiple focus group participants struggled to recall details of the connections they made between their selected news article and a historical topic. Responses to questionnaires and in the focus group interview clearly indicated more focus was placed on finding interesting news articles rather than the historical connection aspect of their essay. Analysis of student work showed that only five students who participated in the study compared details of actual events when discussing a similarity between history and a current event. Most student work did not go beyond surface-level comparison, despite student's claims that they had enjoyed the essay assignment.

Throughout the two-week research, but especially in their current event essays, students made connections between their stories and historical events that had not been covered in class that semester. For example, potential Congressional investigations of President Donald Trump were a common news story during this time period. On multiple occasions, students chose one of these stories to share with the class and then highlighted a similarity to the Watergate investigations of President Richard Nixon. The teacher-researcher examined the news stories that students selected after the class period and found the stories often explicitly compared the two events. Students had either used the connection in the news story or, in the case of examples later in the intervention, simply recited information from class discussion earlier in the unit.

The findings of this research align with previous studies that show the use current event news articles in a social studies class can have deeply personal meaning to students. Antonio, a student of Hispanic origin, responded on his post-questionnaire that current events were very relevant because "actions towards immigration effect me directly being an undocumented immigrant." Increasing student awareness of potentially personal issues in society should be considered another important reason to include current events studies in social studies classes.

Discussion

This research indicates the usefulness of current event studies in the social studies classroom. Student responses to questionnaires and focus group interviews demonstrate student responsiveness to discussion of current events in their history class. The research also indicates that students are more engaged in history class when examination of current event news is present. This finding is supported by responses from students participating in the focus group interviews as well as student engagement ratings taken by the teacher-researcher in the initial period of the intervention. When combined with observations by the teacher-researcher, student engagement ratings in this research demonstrate a sense of boredom with a particular process of comparing news to history rather than an overall lack of excitement about discussing current events. This research shows a need for teachers to use multiple methods of engaging students in work with current events, rather than simply repeating the same strategy.

While students indicated positive reaction to the use of current event news articles in their class, the findings about whether students could make meaningful connections between news articles they chose and historical topics are less clear. Despite student enthusiasm about making these connections, examples from both class discussion and students' essay writing assignment

indicated that students could only make surface-level connections between news and history. It is likely that students need additional opportunities to compare current events to history outside of simply discussing the news each day.

Overall, students struggled to compare details of historic events and current event news topics. Students were more successful at comparing broader themes like immigration policy, international relations and military actions. Students showed a strong ability to recall recurring patterns that emerged from current event news discussion but in both class discussion and their essays were less likely to make similar comparisons to history. To avoid student fatigue and develop students' abilities to make detailed connections with history, students likely need additional opportunities using multiple methods to intentionally make these comparisons throughout a full semester.

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The Effect of Student-Produced Performative Film on Attitude toward Learning

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Film was just coming into fashion as the National Council of Teachers of English (2005) was founded in 1911, and the academic study of film gradually evolved throughout the twentieth century (Milner, Milner, & Mitchell, 2017). Though a great deal of research has addressed pedagogical methods and efficiency in the classroom, there remains a firm stigma that showing film to students is merely an escape for the teacher, a poor use of instructional time, and a break from learning for all involved (Lipiner, 2011). The use of theater is often less controversial, a longstanding tradition in the study of the language arts due to the prevalence of Shakespearean plays and more modern works in secondary English classrooms. After learning film terms and how to read film as text, it is necessary for students to move toward a production element to empower their own creativity and self-efficacy. When producing film, instead of passively receiving film, students are working toward a meaningful and complex mental activity (Milner et al., 2017). Building on prior research, this study seeks to examine the effect of student-produced *performative* film (through the combination of the disciplines of film and theater studies and their pedagogies) on student attitude. Specifically, this study intends to address the question: How does student-produced performative film affect student attitude toward learning?

Literature Review

Recent research has suggested that targeted study of film and filmic language in the English classroom can have a positive impact on both engagement and achievement. Lipiner (2011) utilized film in the classroom as a supplement and an alternative to traditional reading and found that students' grades improved, and they were better able to connect to readings that had not previously interested them. Cagle and Brown (2017) studied the effect of visual, performative, and musical components of film on student interpretation of literature and found that students were able to discern significant themes based on their understanding of filmic elements. Similar to film use in the classroom, performance-based theater instruction has proven

beneficial for students in the English Language Arts classroom. Bugica and Brown (2013) found that students were more invested in lessons about grammar when they were actively involved and able to be creative through performance. Their research suggests that students appreciate creative, hands-on experiences, which may be more conducive to learning than the traditional classroom routine of notes and worksheets.

In a similar vein, many educators are pointing to the necessity of students actively working and producing new media, rather than simply consuming mediums like YouTube videos and social media posts. Bruce (2009) examined the video composition processes of three different student groups, finding that video composition is an effective classroom strategy, allowing for the sequential multimodal representation of thoughts and ideas. Patterson (2015) marries the two most recent approaches to utilizing drama in English classrooms: engaging in theater-based activities and watching films adaptations of plays. This research suggests completion of an amateur video project in a university drama class to increase student engagement. Projects similar to that project can be replicated in high school classrooms, connecting theater studies to film studies, prompting the question: How does student-produced performative film affect student attitude toward learning?

Methods

Extensive research has covered film literacy in the classroom and student use of domain language, but fewer action research studies have addressed student-produced film activities and little has been done linking theater-based instruction, specifically performative instruction, to film production in the classroom. This research seeks to fill that gap by answering the question: How does student-produced performative film affect student attitude toward learning? The study took place during the spring semester at a large public high school in an urban school district in the southeastern United States. The research setting was one English I standard class (the first mandatory English Language Arts class offered at the high school for first-year students, consisting of students at or below grade-level). 9th grade students could self-select to participate in the research study. Overall, twenty-seven students were enrolled in the class where the teacher-researcher conducted his study. Nineteen of twenty-seven students returned all required consent and assent forms in order to participate.

During the first lesson of the intervention, students were introduced to film literacy terms during a mini-lecture. During the second and third lessons, students continued watching the

Zeffirelli (1968) film and reading the adapted text of *Romeo and Juliet* (Shakespeare, 2019) intermittently, but the teacher-researcher began asking students about the filmic elements of Zeffirelli's (1968) text, and students were expected to consider the performance of the actors in both a motion picture context and a theatrical context, along with how those performances might differ based on the context of the specific medium. Once the class reached Act IV, having covered the Zeffirelli (1968) film and the adapted text of *Romeo and Juliet* (Shakespeare, 2019) up to the end of Act III, students began performing the scenes of the adapted text of *Romeo and Juliet*, rather than solely reading the texts at their desks. At the beginning of the fourth week of the intervention, immediately following the final test for the unit, students engaged in the performative film storyboard activity, the summative project for the unit. The teacher-researcher placed students into groups of three or four students with attention to mixed-ability grouping. Students were given a portion of Act V, Scene III (Romeo is entering the mausoleum and is confronted by Paris and they fight one another before Paris dies) and expected to adapt the scene to film, both translating the lines from the adapted play (Shakespeare, 2019) to modern English and translating the contents of the scene to visuals.

For this study, the data collected consisted of a pre-questionnaire and post-questionnaire, student artifacts that include responses to guiding questions about *Romeo and Juliet* (Shakespeare, 2019)*,* student storyboard projects, responses to a short answer test question asking students how the performer for Juliet should approach their role, and teacher-researcher observational notes. The teacher-researcher triangulated evidence, primarily from pre-and post-questionnaires, student artifacts, and written observational notes during data analysis.

Results

Through constant comparative analysis (Corbin & Strauss, 1990), several themes emerged from the data: student engagement, ownership of the text, and accessibility of learning. Of the eighteen students who completed the post-questionnaire, ten students responded to the questions with one or more comments about their personal engagement with the unit or their peers' engagement with the unit. The teacher-researcher recorded similar points in observation notes. Student Q claimed, "It was fun and something different [and] I enjoyed it a lot," comparing the traditional pedagogy of the class to the performative film intervention. When asked how the unit could be improved, Student C responded, "by having [this unit] in drama class or doing something like this again," citing the desire for a similar unit in the same class

later in the semester. Although most students used positive language in their responses to the three post-questionnaire short answer questions, other students were less engaged or wanted to see different activities or outcomes from the unit.

Out of the eighteen students who responded to the post-questionnaire, seven students referred to a sense of ownership through their performances or final storyboard products. Although students did not create elaborate films or undergo an extensive filmmaking production, a feeling of ownership was still fostered through pre-production activities that allowed the students to modify and adapt the text themselves. Other students stressed their feelings of ownership over the text or over the mediums of film and theater specifically. Several students alluded to the promised film production element of the unit that did not occur due to scheduling and time constraints. It should be noted that despite the ownership that many students garnered from the unit, other students, initially excited about the prospect of the production element of the unit, were disappointed when the promised film production project did not occur. This decision may have negatively affected those students' perceptions of themselves as producers of media.

Out of the eighteen responses to the post-questionnaire, thirteen students responded to the short answer questions with explicit comments about the accessibility of the text and facilitated understanding of textual elements in reading the play through the lens of performative film. Many of the students responded by claiming a better general sense of awareness and understanding. Other students pointed to specific elements of drama or literature more generally in which they had a better understanding after the performative film intervention. The students' storyboard projects, completed after the unit, also provide evidence of student accessibility to learning. Students not only demonstrated understanding of filmic elements and the plot and characters of the given scene, but many of them also incorporated movement and performance into their storyboard drawings in various ways. In addition to increased engagement and a feeling of ownership over the text, characters, and the mediums of drama and film, a majority of students indicated a deeper understanding of the text and found *Romeo and Juliet* (Shakespeare, 2019) more accessible through the study of performative film and the storyboard activity adapting a particular scene to an original film.

Discussion

Of the seventeen students who answered the Likert scale questions on both the pre-and post-questionnaires, fifteen students originally said they enjoyed learning about film, with the

distribution leaning toward "Somewhat Agree" and "Agree," with thirteen students in those specific categories. After the intervention, all seventeen students said they enjoyed learning about film with the distribution leaning strongly toward "Agree" and "Strongly Agree," with twelve students in those specific categories. These results support Lipiner (2011), who found that students participated more in class and led to unique discussions with peers when literacy was taught by utilizing films about or related to the text's written subject. While students may not fully perceive of their identities as filmmakers after the storyboard activity, this study supports the findings of Jocius (2013), who stressed the importance of student choice in production. Perhaps if the students in this study were presented with more choice in their method of production, they would have perceived of themselves more strongly as producers and filmmakers. It is possible that students found studying *performative film,* including all the exercises analyzing and discussing performativity, helpful in understanding the characters, whereas *performing* as the characters, specifically, might have been less useful.

Although this study did not reach its initial intended goal of studying the effect of student-produced performative film on student achievement, the teacher-researcher did find that students were more willing to enter drama and the antiquated world of Shakespeare's (2019) *Romeo and Juliet* through reading, discussing, and analyzing the play as if it were a film. In that vein, both theater studies and film studies can benefit through interdisciplinary exploration and through incorporating film studies in a drama unit and theater studies in a film unit. Because this study did not reach its initial goal of studying the effect of traditionally-produced student performative film on student achievement, future researchers may incorporate and prioritize a more streamlined or authentic production activity in a similar unit to consider how the production component (involving cameras and performativity and subsequent editing and presentation) affects either student achievement or student attitude toward learning. It may also be the case that film production presents students with benefits that are unique to the authentic task that cannot be replicated through initial production activities like storyboarding and simply discussing performativity in a play adaptation.

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Argumentative Activities and Reasoning in Elementary Mathematics

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June 2019

Conceptual understanding and adaptive reasoning are two of the key tenets of mathematical learning. According to the National Council of Teachers of Mathematics (NCTM), these are two of the five interrelated strands which comprise mathematical proficiency. As the prevalence of STEM in society and the need for mathematically proficient citizens continues to grow, conceptual understanding and adaptive reasoning are more and more vital to the mathematics curriculum. This means that teachers must include activities in their teaching that help students build understanding and reasoning skills.

The argument for conceptual understanding and adaptive reasoning in mathematics teaching and learning is echoed in the Common Core's Standards for Mathematical Practice (SMP), which state that students should have opportunities to "construct viable arguments and critique the reasoning of others" (CCSSI, 2015). Reasoning, sense-making, and communication are at the heart of this standard, which is often referred to as SMP 3. Jo Boaler, professor of mathematics education at Stanford University, says that reasoning is at the heart of mathematics. Reasoning is particularly important because it gives students access to conceptual understanding. She says that when students participate in activities that focus on SMP 3, they are preparing for the real-life, high-tech world in which they will live and work (Boaler, 2016). She emphasizes the importance of teachers encouraging students to pose questions, reason, justify, and be skeptical (Boaler, 2016, p. 204). These four actions are directly related to SMP 3, and are related to a familiar word, *argument*.

Adams, Ely, and Yopp (2016) refer to an argument as consisting of a claim, referents, and a narrative link. The claim is the basis of the argument; it is what is being argued for. The referent is what is referred to in support of the claim. Referents can include pictures, represented objects, mathematical definitions, actions, numbers, results, and assumptions. Finally, the narrative link connects the referents to the claim. More specifically, the narrative link describes

and explains how the referents support the claim. The narrative link can be thought of as the reasoning component of an argument. This part is particularly important to include in order for arguments to help build conceptual understanding in students. For the purpose of this study argumentative activities are those which require students to use claims, referents, and narrative links. These activities build reasoning and sense-making skills in students, and encourage communication among students. Such activities go beyond the phrases such as "justify your answer" or "provide evidence for your reasoning."

Literature Review

In their study, Francisco and Maher (2010) realized that by giving students the opportunity to explore their own ideas and judge the validity of their mathematical arguments, they were allowing them to become powerful mathematical thinkers who were able to reason and make sense of ideas autonomously. Stylianides (2007) demonstrated how proof can be applicable even in elementary math classes. From their research, Mueller, Yankelewitz, and Maher (2011) highlighted the importance of sense-making as motivation for students to participate in mathematical tasks, or 'do mathematics.'

Lampert (1990) concluded that classrooms can be facilitated in such a way that "in [students'] talk about mathematics, reasoning and mathematical argument – not the teacher or the textbook – are the primary source of an idea's legitimacy" (Lampert, 1990, p.34). Mueller and Maher (2009) found the faulty arguments of students to sometimes be pivotal in building meaning and deeper understanding. Additionally, they found that students seemed to be prompted to challenge each other's assertions through presenting justifications and listening to the arguments of their peers. This led to stronger arguments overall.

Writing and discourse are the two ways of communication that were explored in relation to reasoning skills and argumentation in mathematics. Bicer, Capraro, and Capraro (2013) concluded that writing can help students work through and express their mathematical ideas. Kostos and Shin (2010) found that writing in math provides students the opportunity to have greater communication, which leads to greater understanding of mathematical content. Mathematical discussions open the minds of students and probe them into deeper understanding of math content. The purpose of Francisco's (2012) study was to give insight on how collaborative activity can help promote students' mathematical understanding. The results of the study show the importance of collaborative activity in the evolution of mathematical thinking in

social settings. In their research, Weber, Maher, Powell, and Lee (2008) show how discourse provides students with learning opportunities by probing them to make their implicit warrants explicit, and also by making their warrants the objects of debate. As warrants become explicit in debate, students are required to communicate their ideas in more detail and engage in a higher level of reasoning.

Drawing on previous research on reasoning and argumentation in mathematics teaching and learning, this study sought to answer the following question: "How do argumentative activities affect the reasoning skills of fifth grade students in a mathematics classroom?" Argumentative activities, as defined in this study, required students to provide a claim, referents, and a narrative link to explain their reasoning and justify their mathematical thinking.

Methods and Data Analysis

This study was conducted in a fifth-grade classroom at a rural public elementary school in the southeastern United States. Of the 467 students enrolled at the school, approximately 57.2% are identified as economically disadvantaged. The participants in the study were from a class of twenty-two students. Twelve students from the class participated in the study.

The instructional method for this study was the use of argumentative activities in classroom mathematics instruction. The research sought to explore the effect of such activities on the reasoning skills of students. The study took place over the course of two weeks, with six argumentative activities implemented at appropriate points. On the first day of the study, students completed a pre-test in order to gather data on their initial reasoning skills. The pre-test was a written assignment which required students to produce an argument. Over the course of the next several days, the researcher formally introduced argumentative activities and taught students how to complete them by using an argument. At the end of the study, students completed a post-test, similar to the pre-test, in order to measure reasoning skills in students once again. In order to measure the effects of argumentative activities on the reasoning skills of students, data was also collected from student artifacts and field notes.

Data analysis for this study includes a qualitative analysis of pre and post achievement assessments. Additionally, the researcher used student artifacts to check for reasoning skills over the course of the study. Field notes were used to analyze student discourse interactions that took place during formative assessment.

Results and Conclusions

The six lessons that were part of the study covered multiplying and dividing decimals. The pre-test consisted of a word problem that required students to add decimals. Prior to this the students had learned how to add and subtract decimals. The post-test consisted of a word problem that required students to multiply decimals. The pre-test and the post-test both ended with the following statement: "Please explain your answer by providing an argument in the space below." All argumentative activities completed during the six lessons included questions and prompts that were similar to the pre- and post-tests.

On the pre-test most students simply showed their work and wrote their answers to the question. Two of the twelve students wrote basic explanations for their answers. One student wrote "My answer was 0.75 because the question was asking how much in all, so the equation was $0.50 + 0.25$, which equals 0.75." The other student wrote "This is the answer because $25 + 50 = 75$ and you just write your decimal." These two students seem to have seen the word "argument" in the prompt and decided to give some explanation for the answers. These two students showed some reasoning in their answers. It can be assumed that most students provided basic answers to the question because they had minimal knowledge of what it meant to provide an argument in mathematics. The teacher also confirmed that the students had not been explicitly taught argumentation skills prior to the study.

In order to assess the quality of students' arguments at the end of the study, a rubric was created and used to score student responses on the post-test. Each student received a score of either 0, 1, or 2 for all three parts of the argument, which included the claim, the referent(s), and the narrative link. A score of 0 indicates that nothing was provided for the part of the argument. A score of 1 indicates that something was provided for the part of the argument, but it was lacking in clarity. A score of 2 indicates that something was provided for the part of the argument and what was provided was clear. The three scores were then combined to give an overall score for each argument between 0 and 6.

All twelve students in the study labeled all three parts of an argument in their responses on the post-test in the correct order. All twelve students also wrote something beside or under each label. So, after the six lessons all participants at least remembered the parts of a mathematical argument and attempted to provide a response for each part of the argument on the post-test.

Of the twelve participants, two received a score of 3 on the post-test, four received a score of 4 on the post-test, three received a score of 5 on the post-test, and three received a score of 6 on the post-test. This means that 25% of the participants provided arguments that were exceptional in clarity on the post-test. For the claim, some students received a score of 1 because they did not use words in their response. In order to receive full credit for clarity, words were needed along with number answers in the claim to explain exactly what students were claiming. Those who received a score of 2 for the claim provided context for their answers by including words. The narrative link was particularly important to the study since it encompasses the reasoning component of a mathematical argument. Of the twelve participants in the study, six received a score of 2 for the narrative link on the post-test. This means that 50% of the participants demonstrated clear reasoning skills. This is a significant improvement from the results of the pre-test.

While the post-test provides valuable information about the results of argumentation in mathematics instruction, student artifacts from the six lessons during the study also provide valuable information about how argumentative activities affect reasoning skills in mathematics. Over the course of the lessons the clarity of the students' arguments strengthened as they gained a better understanding of the purpose of argumentation and how to use it to fully explain their answers. For instance, they increasingly included more words in their claims and more detail in their narrative links. As a result, they explained their answers more fully and their mathematical reasoning was more visible.

Student growth in terms of argumentation was evident in student discourse as well. During the six lessons the students had various opportunities to discuss their thinking as they completed argumentative activities. During one lesson a student said "we use arguments in math when we disagree with each other." Students refined their verbal argumentation skills by learning how to communicate their mathematical thoughts to each other in group settings appropriately and effectively. Students often said "I agree…" or "I disagree…" during discussions with their peers when expressing their mathematical thoughts. As a result of the discussions, they often experienced moments when they had mathematical realizations that shaped their own thinking after hearing what someone else thought. One example of this is when one student said "I finally understand why the answer is 0.9 and not 0.3."

Based on the results of the study, one can conclude that argumentative activities affected reasoning skills positively. Argumentation made students' mathematical reasoning more visible. In order to provide clear arguments, students had to think about their reasoning. When only an answer is required in math, students might not explicitly think about why they come to the answer. Argumentation prompted students to make sense of their answers and to consider the validity and accuracy of their mathematical thoughts.

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The Effects of Inquiry Tasks on Students' Conceptual Understanding and Attitudes

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June 2019

School is designed to provide students with the skills and knowledge needed to overcome obstacles that they may face throughout life. Students are often disengaged while they are in mathematics class and this leads them to not partake in the higher levels of thinking that allows students to apply mathematics to their lives. Boaler (2016) states that students will develop a deeper understanding of mathematical concepts if they need to apply information that they are learning to prior knowledge and cultivate the problem solving process. This process is facilitated by exploration of mathematics topics in open-ended tasks with multiple answers. Open tasks allow students to think about the problem from different perspectives and use multiple representations. This paper will explore how mathematics is taught currently and then will discuss how educators can enhance mathematics pedagogy to better prepare all students.

Literature Review

Traditional mathematics classrooms focus on teaching students the procedural skills needed to do mathematics. However, students need to be equipped with the conceptual skills and reasoning skills as well. Successful mathematics teaching fosters a student-centered environment with a focus on collaboration, communication and co-constructing knowledge. There are multiple ways to assess students' level of understanding and content knowledge including standardized test scores, class discussions, homework, classwork, class quizzes and tests. Several studies show how students used reasoning skills which provided teachers with a way to evaluate their understanding of the mathematics lesson.

A longitudinal case study was conducted to examine the intersection of inquiry activities and students' mathematical discourse (Staples, 2007). The primary class in this study was a 9th grade pre-algebra class that consisted of approximately twenty students. The pre-algebra teacher utilized inquiry activities to assist the students in the development of procedural and conceptual fluency in mathematics. Results revealed that students who discussed their thinking with peers discovered each other's mistakes, which helped them develop a more thorough understanding of

pre-algebra. The data indicated that the use of inquiry-based lectures at the high school level combined with a focus on mathematical discourse improved students' deeper understanding.

Manouchehri (2007) examined the impact of inquiry tasks on middle school students' understanding of mathematics. The researcher assessed students' conceptual understanding using observations and field notes when the students presented their solutions to the assigned inquiry task. Results determined that students utilized reasoning and justifications which demonstrated their deeper understanding of the content.

Research studies have examined the use of inquiry tasks in mathematics classes at the high school and college level. They supported the use of inquiry tasks and demonstrated the improvements they had on students' deeper conceptual understanding. Additional studies looked at attitude outcomes from inquiry tasks. Students' attitudes about mathematics included their motivation, engagement, and enjoyment in the classroom.

Miller and Wakefield (2014) found that the use of inquiry-based lectures in a mathematics classroom allowed students to have a more positive attitude towards mathematics. This study investigated the effects of inquiry-based teaching on students' attitudes towards geometry and their understanding of the content taught. Wakefield instructed a college level geometry class using an inquiry based approach and examined the impact on his students' attitudes. The researchers found that the students' attitudes about mathematics had become more positive after the inquiry lessons. The students were given a survey that asked them to express how they felt about the use of inquiry and students' responses included the following, "… I have learned a lot and am [better] able to express myself" (Miller & Wakefield, 2014, p. 270). The researchers concluded that inquiry-focused instruction led students to feel more confident in their ability to explain and write about the mathematical reasoning used to solve problems.

Hassi and Laursen (2015) examined the effect of inquiry activities on students' attitudes towards mathematics in interviews with sixty-eight undergraduate mathematics students who completed inquiry based mathematics courses. As a result of the interviews, the researchers concluded that 88% of the mathematics students experienced more confidence, higher self-efficacy and overall felt better about their mathematical ability after completing inquiry based mathematics courses. The interviews suggested that students' attitudes about their mathematical ability were more positive when inquiry tasks were incorporated in the classroom.

The related research in the field of mathematics teaching suggested that inquiry tasks led to more positive attitudes and deeper understanding for students. The research studies provided evidence that inquiry tasks improved students' deeper understanding and achievement scores. There was also evidence that inquiry in the classroom improved students' attitudes towards mathematics and their ability to learn mathematics. To further examine this instructional tool in context, this study will address the question: What are the effects of inquiry tasks on students' conceptual understanding and attitudes in a high school mathematics classroom?

Methods

The study took place in a public high school in the southeastern United States. This school enrolls 2,300 students of which approximately 24% are economically disadvantaged. The participants were from a Math 3 class of twenty-three high school students in 10th or 11th grade. The Math 3 curriculum contained a variety of topics including algebra II, geometry and pre-calculus. The researcher utilized the intervention three times, implementing lesson activities which included inquiry tasks. An inquiry task is one that asks students to come up with their own ideas about how to answer a question. The first inquiry activity students explored was the possible radii and heights for cones and cylinders that make the volumes equal. For the second inquiry activity students were given a party planning investigation where they were asked to determine the most economical option for cylindrical vases needed for a party. The third inquiry activity that students investigated was the relationship between the circumference of a circle, and the radius and diameter of the circle. The researcher collected data in the following forms: pre- and post-attitude surveys, field notes, focus groups, student work samples and pre- and post-achievement assessments. During class, some lessons were videotaped and during the focus group, the audio was recorded.

Artifacts from the Math 3 class were used to assess their conceptual understanding of the mathematics topics. The students completed a pre-achievement assessment test to determine prior knowledge. The students were given a post-achievement assessment at the end of the study to measure their understanding of two-dimensional figures, three-dimensional figures and application questions involving shapes.

The pre- and post-attitude surveys were examined to determine if there was a change in students' attitudes towards mathematics. The researcher field notes, focus group responses and pre- and post-attitude surveys were used to analyze students' attitudes towards the inquiry

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activities that were implemented during the intervention period. The narrative data from the students was qualitative and was analyzed for common themes that multiple students stated. The pre-and post-achievement assessments data were used to determine the students' conceptual understanding of mathematics across each week to look for patterns as well as changes in reasoning skills. All data was analyzed to identify changes that may have occurred in attitude or achievement during the inquiry lessons.

Results

This research included a pre-attitude survey and a pre-achievement assessment that were administered at the beginning of the study. During the course of the geometry unit on two-dimensional and three-dimensional shapes, various inquiry tasks relating to volumes, cross sections, and application questions were implemented. At the end of the unit the students completed a post-attitude survey and post-achievement assessment. Data also included field notes from daily class instruction as well as student responses from a focus group.

From comparing pre- and post-attitude surveys, the data showed that many students' attitudes towards mathematics improved over the course of the study when asked "How do you feel during math class?" There was an increase in students' positive attitudes during the post-attitude survey which suggests that after the intervention students felt more positive towards mathematics compared to when the unit began. The intervention also decreased the number of students who felt neutral or negative about mathematics.

Data from post-attitude surveys, field notes, and student responses from a focus group of five students suggested that four major themes emerged when students were asked to explain how they felt about the inquiry tasks utilized throughout the research. These themes included that students found the material to be enjoyable, applicable, challenging and collaborative.

During the focus group and student open-ended responses from the attitude surveys, many of the students stated that the inquiry activities utilized in the classroom led them to enjoy mathematics class more than they had in the past. The students' narratives mentioned that the inquiry activities were "exciting," "fun," and "engaging." These key descriptor words are all characteristics of students' attitudes towards mathematics after the completion of the intervention which reiterates that students' attitudes about mathematics tended to improve over the course of the research. The students' responses on the attitude survey and in class observations reinforced

that the inquiry activities increased students' enjoyment of mathematics and thus improved their attitudes towards the subject.

A majority of the students characterized the inquiry activities as "interesting," "relevant," and "relatable." During the focus group, one student elaborated on their opinion towards mathematics by stating "the real life applications…like the party planning one … helped me more" then went on to explain that she was interested in exploring the application question regarding cylindrical vases and volume. The use of inquiry activities led students to visualize the applications of mathematics and connect mathematics to their own experiences.

The students that completed attitude surveys and the students that participated in the focus group tended to find the inquiry activities to be challenging. The students' asked questions which were primarily to clarify the tasks and to ask the researcher for hints and tips as to how they should begin to complete the tasks and what they should do first. The inquiry activities were intended to be open-ended and require students to think through each activity and utilize their problem solving skills to work through each task. Student responses from the focus group and post-attitude survey stated they "learned more," were "more motivated," and they were more likely to "pay attention" when working through the inquiry activities.

The narrative data supported the conclusion that students enjoyed the "communication" aspects of inquiry tasks and were more "open-minded" to one another's ideas. A student from the focus group stated, "It feels more comfortable … with your … classmates because if you are confused they can help you" and others explained that they enjoyed "bouncing ideas off each other." The students explored multiple perspectives when completing the inquiry tasks.

The achievement data was based on a four question assessment containing questions about volumes, densities, cross sections and rotations which were the main standards included in the unit. Each of the four questions was graded on a 2-point scale where students could receive partial credit. The twenty-three individual student's pre- and post-achievement data provides evidence that 100% of students' scores improved by the end of the research. During the inquiry activities, students displayed higher levels of thinking by connecting material learned to additional concepts and investigating relationships.

Conclusions

This study sought to examine the effect of inquiry tasks, open ended activities that require problem solving skills, in a high school mathematics classroom on students' attitudes and

conceptual understanding. Three inquiry activities were implemented to investigate volume formulas, application questions and properties of circles. The data from analyzing the pre- and post-attitude surveys, focus group student responses and field notes indicates that a majority of students' attitudes towards mathematics class became more positive. From examining student work samples and pre- and post-achievement assessments, the data supports the conclusion that inquiry tasks improved conceptual understanding of two-dimensional and three-dimensional shapes.

The limitations to this research include the small number of students, the short length of the intervention, and the focused mathematical content. Due to the small sample size, twenty-three students, this research cannot be generalized to larger populations of students. Additionally, this study was conducted over the span of three weeks where one inquiry activity was implemented per week which is a somewhat short interval. A considerable amount of the students' responses on post-attitude surveys suggested that they enjoyed the geometry unit because they understood the concepts.

After implementing three inquiry tasks in a high school geometry unit over the course of three weeks, students' attitudes towards mathematics class became more positive and students enjoyed the class. When inquiry tasks were used to teach students about two-dimensional and three-dimensional shapes the students increased their understanding of the content.

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How the Practice of Intercultural Pedagogy Impacts Cultural Intelligence among Students

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June 2019

The modern world is a place where in some regions rampant political tumult necessitates migration and where in others, ambitions give rise to the prospect of relocation. This is a place where through advanced technology and economy of travel, it is more likely that for their surroundings even provincial citizens will need intercultural savvy on a regular basis. Teachers can create learning opportunities that give students a chance to increase their cultural fluencies. Studies show that there is a strong correlation between Cultural Intelligence (CQ) and writing proficiency (Ghonsooly & Shalchy, 2013), social integration in student-communities (Thompson, 2018), and definition of ones' worldview in contrast to others' (Smolcic & Arends, 2017). A teacher who is privy to the corollary between Cultural Intelligence and societal wellbeing finds practical application for increasing CQ among students. Thus, this action research posits the question, *How does practicing Intercultural Pedagogy impact Cultural Intelligence among students in an English Language Arts classroom?*

Literature Review

A cursory survey of education research conducted over the last thirty years reveals a high volume of theoretical interest in responding to increasingly diverse ethno-linguistic backgrounds among American public-school students. In what Maxwell, Waddington, McDonough, Cormier, and Schwimmer (2012) call a *collective project* that is guided by arrival cultures, interculturalism becomes a union of fundamentally different cultures; it not only brings them together for a blind-date but arranged-marries them for the establishment of an integrated family. Indeed, education researchers worldwide have experimented with interculturalism as a way of embracing an open-ended new identity for diverse classroom communities. In their multiple case study that spanned schools in three different European countries, Messiou et al. (2016) sought to "make use of (student) differences as a means of stimulating new ways of thinking about challenging problems" (p. 47). With experimentation surrounding seating arrangements, crafted lesson plans, and attention to accommodations for special needs, the team's pervasive question was,

"How can teachers develop more inclusive practices by engaging with the views of students?" (p. 48). The answer was/is practicing pedagogy that faces and looks into the eyes of cultural diversity. But this gaze may not be instinctive for teachers. In Seelye's (1996) collection of *Experiential Activities for Intercultural Learning,* educators James Baxter and Sheila Ramsey demonstrate how to strategize meaningful confrontation by using "critical incidents" as assets and advocate a training methodology that drives toward "culture bumps" (p. 211), encounters that can be contrived in the classroom in order to address inevitable misunderstandings that result from differing worldviews. Students encounter these differences, improvise reactions, and analyze "real-life intercultural interaction" that can "lead participants from an understanding of specific behaviors to a recognition of underlying cultural generalizations" (p. 212). Instead of automatically glossing over cultural conflict, the instructor learns to pinpoint misunderstandings, bring them into the open, and hopefully dissipate silent tension.

Cultural Intelligence (CQ) is the ability to operate successfully in culturally diverse situations (Ang et al., 2007). While the theory has existed for centuries, a measuring tool for what had formerly been a nebulous sense of cultural savvy was not developed until the 1970s by Ang and his team and later adopted by the Cultural Intelligence Center. Through years of clinical research and revisions, the team crafted Likert Scale questions that gauge acumen in four different ranges of Cultural Intelligence (CQ). Designed to measure twenty different factors, the questions divide into four sub-sets, Metacognitive CQ (getting and making sense of knowledge), Cognitive CQ (hard knowledge that can be recorded on paper), Motivational CQ (mental capacity to direct and sustain energy related to particular action), and Behavioral CQ (doing/acting beyond conscious thinking), each with its own implications for aptitude in cultural interactions (Cultural Intelligence Center, 2005).

If CQ strongly correlates with student academic success and social integration and CQ can be elevated with intervention, then educators can be more confident that practicing proven Intercultural Pedagogy is worthwhile. The logical question then is which practices are proven? At this point of inquiry, the body of research and resources shrinks. In an attempt to address the deficit, Seelye (1996) offers thirty-two creative activities for fitness in interculturality. Experienced moderators can spearhead such activities so that group participants can explore their own cultures and then, according to activity designs, interlay each individual culture for exposure of differences and points of conflict.

Methods

This research intervenes with intercultural activities and teaching techniques practiced in the context of an eleventh grade Honors English Language Arts classroom at a public high school extension in North Carolina that was comprised of twenty students from various different ethnic backgrounds. Intervention of Intercultural Pedagogy followed a lesson plan format for each of six days. The researcher introduced an intercultural concept and then defined the goals for a corresponding activity. At the conclusion of each activity the researcher led a debriefing discussion that covered how effectively the activity achieved the stated goals. In addition, the researcher conducted short interviews with volunteer students in front of the class in order to expand on the purpose of preceding activities. The context of the interview gave the class a wider perspective on one of their classmates and modeled what kinds of questions one can ask in an effort to more fully understand another person and their culture. Cross references to these encounters were made in subsequent activities or during debriefings. Another feature of the design in Intercultural Pedagogy lesson plans was presented as a ritual exercise to kick-off class periods. Since rituals are an important feature of many indigenous cultures (Hammond, 2015), the researcher designed a routine that would recognize diversity and embrace distinctive sayings as a common family feature among students.

Prior to Intercultural Pedagogy intervention students completed The Cultural Intelligence Scale (CQS), created by the Cultural Intelligence Center (2005), which grants use of the scale "to academic researchers for research purposes only" (Ang et al., 2007, p. 366). After the conclusion of treatments, CQS was administered a second time. Data from CQS are dually quantitative and qualitative. Immediately following the CQS pre-test, students completed an ethnic Self-Identification Form. Additional qualitative data includes researcher field notes and photographs of the classroom white board, adhesive stereotype label cards, an Intercultural Self-Disclosure Scale, personal and collaborative physical maps of student communities, and student Critical Incident prose paragraphs and subsequent analysis forms.

Using constant comparative analysis, including open coding, axial coding, and selective coding (Corbin & Strauss, 1990), the researcher examined both the quantitative and qualitative data collected in this study. Since the Cultural Intelligence Scale (CQS) is a well-established and respected tool for self-characterizations and based on a numerical Likert Scale, the researcher

used pre- and post-CQS scores as the starting point for quantitative data analysis and, in volumes of qualitative data, further analyzed impact on student Cultural Intelligence.

Results

For the Cultural Intelligence Scale, which uses a Likert Scale of 1 to 7 where 7= strongly agree and 1= strongly disagree, class scores were averaged in each of four Cultural Intelligence factors: Metacognitive, Cognitive, Motivational, and Behavioral. The class post-test average was higher than the pre-test average in each of the four Cultural Intelligence factors across the board. These among other various number valued data comprised results for this research study that point to a quantifiable rise in CQ with the practice of Intercultural Pedagogy.

For qualitative results, a noteworthy sample gleaned from researcher field notes and pertaining to the Metacognitive factor for Cultural Intelligence follows. In the Exploring Stereotypes activity on Day 2 the researcher noticed a student called Ashlyn grappling with the concept of stereotypes in the context of cultural differences in families. She chose "Hispanic family" as the identity label that was most dear to her. Later when she was asked to name a stereotype often attached to that identity she wrote, "illegal." When a fellow Hispanic student commented that another stereotype of this cultural identity was that Mexican/Hispanic dads are typically "protective," the researcher followed with the question, "Is this a stereotype?" to which Ashlyn answered, "No. It's true." This field note among others was taken as a reflection of the Metacognitive factor because it pointed to insight the students possessed at a subconscious level and how they were taking an opportunity to surface it in open dialogue with the researcher and with each other. Cultural Intelligence was on the rise.

Qualitative data extracted from researcher field notes and charted on a Motivational factor spreadsheet says about Zelda, a remarkable student, "noticed her prior to the first intervention during days of observation as dismal/distant/ unable to answer questions/ checked out though sitting up straight"; But on Day 3 of Intercultural Pedagogy, "Zelda was ready to not only answer when called upon but volunteered answers 2-3 times – clearly motivated by the topic." About Lafonda the researcher wrote, "Raised her hand to answer every single question during debriefing of Activity 6. Extremely engaged." In a description of Ford she wrote, "Very drowsy during self-disclosure discussion," and took this result as possible lack of Motivational CQ. Each of these observations was valuable data for charting the progress of Cultural Intelligence, whether flatlining, rising, or falling.

Discussion

Given the fact that the Cultural Intelligence Scale asks test-takers to rate themselves by answering questions related to their cultural savvy, it is noteworthy that self-declared scores for measuring CQ are not always perfectly accurate. Consideration must be given for how much more self-aware the students were from the beginning to the end of this intervention, thus making themselves more informed and sharper critics of themselves. Their post-test answers were probably truer to their actual knowledge than their pre-test answers, which were given without students being primed for understanding the questions. Hence, the researcher will neither ignore the T-test insignificance factor nor accept it as proof that the impact of Intercultural Pedagogy on Cultural Intelligence is not deep enough to merit further research and expansive design.

Going beyond the ELA classroom and implementing Intercultural Pedagogy in every course across the curriculum, it is possible that teachers can help students recognize and break stereotypes and more intuitively recognize that peers from other cultures are processing information from a worldview different from their own. This knowledge can lead to breaking silence when it comes to cultural subjects and can encourage students to more confidently make inquiries of one another out of a desire to understand and care for people who are different from themselves.

None of the benefits that surfaced in qualitative results of this study would be possible without a classroom community that is organically diverse in its representation of ethnicities and cultures. The results of this study and a pending saturation of others like it could go far to boost confidence in empirical data that suggests, in Jack Johnson's (2012) song lyrics, "it's . . . better when we're together" (chorus).

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Demonstration of Scientific Mindset in Secondary Students through an Independent Research Project

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June 2019

Scientific thinking skills like observing, questioning, and discovering enhance people's daily lives by allowing them to think critically for themselves (Siegel, 2017; UC Berkeley, 2018). Research findings from Paul and Elder (2012) suggest that our natural and uneducated thought processes are biased, partial, and uninformed. When we try to solve problems or answer questions, the scientific mind thinks logically rather than rooting thoughts in those biases. According to Kuhn (2010) having a scientific mindset is thinking in terms of inquiry, analysis, argument, and inference. Sener, Turk, and Tas (2015) found that projects in the science classroom are one way to benefit scientific mindset and make students' thinking processes more visible. An independent research project (IRP) is a project in which the students work independently to research a topic. The act of researching can challenge one's own thinking, and seeking outside help from proper sources is an aspect of a scientific mindset (Siegel, 2017).

This study aims to understand whether having high school chemistry students complete an IRP will allow the students to express or demonstrate aspects of a scientific mindset.

Review of Literature

Sener, Turk, and Tas (2015) claim, "science has become an indispensable part of our daily lives by manifesting itself in every field of our lives" (p. 57), and that humans become naturally curious about phenomena and the world around them from a young age, asking questions such as, "what happened?" and "how, or why, did this happen?" in order to make discoveries. They argue that asking questions in order to understand a topic better is a characteristic of research, meaning children are capable of thinking like researchers from a young age. Lex Starwalker (2014) claims, "curiosity is the heart and soul of science. Scientists never lose that childhood infatuation with the question 'Why?'" Developing a scientific mindset requires the development of scientific skills, which can be used in or adapted by one's daily life

(UC Berkeley, 2018). Paul and Elder (2003) declare that verbal and written clarity, accuracy, precision, relevance, depth, breadth, and logic are the eight elements of a scientific mindset, while Kuhn (2010) poses that scientific mindset is thinking in terms of inquiry, analysis, argument and inference. All of these skills are true of a scientific mindset, but they are not all always present at once, nor are they the only traits of a scientific mindset. At times someone with a scientific mindset may only portray a few traits at once, for example relevance, depth, argument and logic when engaging in an argument.

Research by Sener, Turk, and Tas (2015) suggests that some work in school science takes a recipe-like approach, with a list of procedures to be followed to get a direct result— one which the teacher expects will happen. Student-centered approaches to learning, such as open-ended investigations or IRPs, may combat the recipe-like approach (Sener, Turk, & Tas, 2015). IRPs are effective for allowing students to inquire about a topic independently, and also more effective for assessing the students' abilities for performing inquiry and research tasks independently, which leads to more long-lasting knowledge and understanding when compared to the recipe approach (Hendrick, 2017). Despite the potential benefits of IRPs in high school science classrooms, there is little research on the ability for students to demonstrate scientific mindset through participation in an IRP (Conner, 2010).

IRPs can be designed using the BSCS 5E Instructional Model which is a list of 5Es to guide lesson and instructional planning; the 5Es are engage, explore, explain, elaborate, and evaluate (Bybee, 2009). Students are likely to employ a scientific mindset through participation in an IRP by engaging in inquiry, analysis, relevance, and logic, a composition of the ideas of Paul and Elder (2003) and Kuhn (2010). In an IRP, students should inquire about a scientific topic, analyze their findings, choose what information is relevant, and use logic to present that information in a way that others could understand. Doing this, students make observations and ask questions that lead to more information, which are necessary qualities of a scientific mindset (Paul & Elder, 2003; Siegel, 2017). Despite these claims about IRPs, little empirical research on IRPs exists. The aim of this study is to investigate whether an IRP in a secondary science class will allow students to demonstrate aspects of a scientific mindset.

Methods

In this study, the teacher-researcher explored the potential ability for students to demonstrate aspects of scientific mindset through an IRP. This research was conducted in a

suburban high school. The participants of this study included 46 students from two sections of honors chemistry. All participating students in these two classes had parental consent, and gave their assent, to participate in this study. Student identities were de-identified by using number/letter combinations during data entry in order to analyze their work. Pseudo-identities were given as A# and B# to denote students in different class periods.

In the second half of the semester, following the unit on the periodic table, students chose an element from a list provided to them which prevented students from choosing elements that are not essential to their understanding of chemistry at the high school level, like those that are man-made. The list of available elements by their chemical symbol are as follows: H, He, Li, Hg, B, C, N, O, F, Ne, Na, Au, Al, Si, P, U, Cl, Ar, K, Ca, Ti, Fe, Co, Ni, As, Br, Pb, Ag, I, and S. Only one student per class section could choose one of each element to prevent overlap. The students were given about ten minutes of instruction about what an IRP is and how they were expected to complete it. They had three days to perform research on their element. IRP presentations were given on the fourth day.

Each IRP presentation was delivered in the format of a three-minute thesis (3MT) with a single-slide visual through Microsoft PowerPoint or Google Slides. The 3MT format was designed in 2008 by the University of Queensland (UQ) for graduate theses. Though the students in this study did not need to present a thesis, the 3MT presentation style was adapted for use in this study to shorten students' presentations for each class section to fit within a single class period. The teacher-researcher took field notes throughout the presentations which included some quotes from students that used scientific language or a thorough explanation and/or elaboration. Since most of the students' work was done outside of school, data collection included all student work in planning and their hard-copy presentations, the rubrics for students' self- and peer-evaluations, the scoring rubric completed by the teacher-researcher, and field notes taken during the presentations.

The data were coded for demonstration of aspects of scientific mindset: inquiry skills, questioning skills, observation skills, and critical thinking skills. The first round of coding was performed on the participants' work samples, which included the worksheets on which they did their planning and drafted their IRP presentations, as well as the final copy of students' single-slide and oral presentations. While reading through the data it was determined that there were a few other themes emerging. Based on these emerging themes, the next round of coding focused

on connections to prior learning or real-life experiences; scientific language use; incorporation and use of the 5Es (i.e. engaging the audience during oral presentations or students scoring themselves as highly engaged on their self-evaluation rubric, explaining and/or elaborating with detail and clarity, etc.); and whether students created a references page or listed sources used in their research. Field notes taken during students' presentations were also analyzed for aspects of scientific mindset. Students' self-evaluation rubrics were used to code for their engagement and exploration during the IRP.

Results

Data analysis revealed that students demonstrated scientific mindset in many various and individualistic ways. While some students demonstrated use of questioning and critical thinking, others demonstrated use of scientific language and making connections to prior learning. Some students demonstrated many aspects of scientific mindset through an IRP, while others demonstrated as few as two of these aspects. All participants in this study demonstrated use of scientific inquiry, while 40 demonstrated questioning skills, 20 demonstrated critical thinking skills, 7 demonstrated use of observation skills and sensory descriptions, 37 demonstrated making connections to prior knowledge, other subjects, or personal experiences, 37 demonstrated use of scientific language, and only 3 provided a list of their research sources. The data show that students did not all demonstrate scientific mindset in one way, and that the many aspects of scientific mindset found in the literature and throughout the emergent themes in the data manifested differently for each individual student. Students struggled the most with demonstrating observation skills through an IRP and with providing a list of their sources. Students were most likely to demonstrate inquiry and questioning through their work on the IRP.

The IRP was planned by the teacher-researcher with the 5Es in mind. To engage students during the IRP, they were given freedom in self-direction for the design of their single-slide visual and the information to be conveyed in their oral presentations. The data indicate that the majority of students reported a high level of engagement (80.4%). The remainder of students (19.6%) were somewhat engaged, while no students reported being completely unengaged. Though the 5Es were each incorporated in the planning of the IRP by the teacher-researcher, there were indications of use of the 5Es from the students as well. Their autonomous use of the 5Es included use of each of the "E" functions except evaluate. Seven students engaged their

peers during their presentations, 41 reported in-depth exploration of their topic, 31 used explanation skills during their presentations, and 11 were able to elaborate on those explanations.

Some of the aspects of scientific mindset demonstrated by students intertwined with one another, such as students' use of scientific language in making connections to their prior learning, and questioning and critical thinking skills leading them to use more scientific language. This means that these students demonstrated a scientific mindset through multiple aspects at a time. Some of the aspects of scientific mindset also intertwined with students' use of the 5Es, showing a possible relationship between critical thinking skills and using elaboration, and between making connections to prior learning and use of the explain function of the 5Es.

Discussion

The majority of students in this study utilized and demonstrated inquiry and questioning skills more than the other analyzed aspects of scientific mindset during the completion of their IRP and through their oral presentations. This means that through completion of the IRP designed by the teacher-researcher, students demonstrated a strong scientific mindset with regard to the aspects of inquiry and questioning. However, only seven of the 46 participants in this study demonstrated observation skills through their IRP. This means that although students were able to strongly demonstrate inquiry and questioning skills, they were not able to demonstrate all aspects of a scientific mindset with the same strength. The majority of the researchers in the literature based their ideas and findings of scientific mindset around questioning and curiosity, so although students failed to demonstrate a plethora of aspects of a scientific mind the majority did manage to demonstrate that key aspect. Critical thinking skills, observation skills, and recording use of multiple sources to show skepticism and affirmation of researched material were among the skills least likely to be demonstrated by students through the IRP.

A potential limitation of this study was the timeframe in which the IRP took place. Time was limited for the IRP, and given more time students may have been able to choose their own topic from a broader variety of possible chemistry topics, done more research on their topic, and created a more elaborate presentation to demonstrate their knowledge and aspects of scientific mindset. Additionally, students in this study were responsible for scoring themselves on certain aspects of their use of the 5Es coded for by the teacher-researcher, and therefore the reliability of these data could be questionable based on whether students were entirely honest or not when scoring themselves in these categories.

The provided planning worksheet and the 3MT presentation strategy were very efficient methods for the IRP in this study, and educators planning to implement an IRP in their classroom may consider using these methods. In both classes of participants in this study, the 3MT allowed every student to complete their oral presentation within a 90 minute class period. A major benefit of having students complete their IRP on a specific element was that this project followed the periodic table and the atom units, which led the students to build upon their learning in the class and promoted their ability to make connections between their research and prior learning. Because of this, it is suggested for educators planning an IRP that the topic or topics of the IRP align with some part of the curriculum to benefit the students by connecting their in-class learning with the scope and topic of the project.

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Effects of Adapted Primary Literature Use on Scientific Literacy

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According to national and international testing data, over two-thirds of students in middle and high schools in the United States struggle with reading and writing in disciplinary content areas such as science (Carnegie Council on Advancing Adolescent Literacy, 2010). Scientific literacy, as defined by the National Science Education Standards (National Research Council, 1996), encompasses not only the ability to use an understanding of scientific content and scientific practices to participate in decision-making that is personal or that affects others in a global community, but also the ability to critique the quality of evidence or validity of conclusions about science in various media (National Research Council, 1996). According to Drew and Thomas (2017), the Common Core State Standards (CCSS) and the Next Generation Science Standards (NGSS) hold students to higher literacy standards in science than in the past, yet in many cases science teachers are reluctant to teach literacy in science class (Drew & Thomas, 2017; Moje, 2008). One resource that might serve as a bridge for teachers to better develop scientific literacy in the classroom is adapted primary literature (Yarden, Norris, & Phillips, 2015). This study sought to uncover how, if at all, the use of adapted primary scientific literature in a high school science course impacts scientific literacy – specifically, critical thinking and nature of science (NOS) understanding.

Literature Review

With such widespread consensus about the importance of scientific literacy among science education researchers and standards documents, one would think that classrooms would be thoroughly imbued with scientific literacy practices. Sadly, this is not the case; many science teachers feel ill-equipped to incorporate literacy into their classroom, or else feel that literacy should be taught elsewhere (Drew & Thomas, 2017; Moje, 2008). With such a reluctance to incorporate scientific literacy into the science curriculum, it's no wonder studies show that many

students have a distorted or incomplete proficiency in understanding the NOS and scientific literacy skills (Drew & Thomas, 2017; Sadler, Chambers, and Zeidler, 2002).

Primary literature serves as a major source of communication within the field and the main conduit for the spread of scientific discoveries. However, learning through and from primary literature can be difficult for novices and hard to implement in high school classrooms because primary literature often lacks reader-friendly aids like metaphors, analogies, and examples and often contains science-specific vocabulary, passive voice, and unique grammatical attributes (Baram-Tsabari & Yarden, 2005; Halliday, 1993; Lemke, 1990; Yarden et. al., 2015). An alternative to primary literature is secondary literature, which encompasses popular-scientific articles often for the print mass media (Baram-Tsabari & Yarden, 2005). However, secondary literature often does not preserve the original sequence of the research article from which it is adapted and thus does not allow students to logically flow from theoretical background to research hypothesis, methods, experiment, results, discussion, and future hypothesis the same way that primary literature does (Baram-Tsabari & Yarden, 2005).

Primary and secondary scientific literature both have downfalls and can contribute to students not developing scientific literacy skills/knowledge. Adapted Primary Literature, or APL, is a solution to this problem; primary literature can be "translated" into a format that is appropriate for the cognitive abilities of high school students while maintaining the canonical structure of the original article (Yarden et. al., 2015). Despite the demonstrated need for an emphasis on science literacy at the high school level and the promising benefits of incorporating research articles in the classroom, research on the use of APL in high school settings is limited, and much of the research thus far has been conducted in countries outside the US (i.e., Baram-Tsabari & Yarden, 2005; Brill & Yarden, 2002; Falk, Brill, & Yarden, 2008). Inspired by the emphasis made by education reform documents on scientific literacy and its essential components such as critical thinking skills (i.e. analysis and evaluation) and NOS understanding, as well as the compelling results from research studies on the use of APL in science classes, this study sought to uncover how, if at all, student use of APL impacts critical thinking and understanding NOS in a secondary science class.

Methods

This research was conducted in a high school honors biology classroom composed of 9th and 10th grade students located in a mid-sized city in the Southeastern United States. The school

has a population of approximately 1800 students, of which roughly 74% are White, 13% are Black, and 7% are Hispanic. 11 students and one cooperating teacher participated in the study. The teacher researcher conducted all the classes and interviews.

Over the course of three units spanning roughly one month, students participated in reading three APL articles adapted from scientific papers published in peer-reviewed research journals. For the first two articles, students turned in a summary and reflection after a class reading and scaffolded discussion. For the third article, students read the article either independently or in small groups and turned in a summary and reflection. Students completed a pre- and post-questionnaire about their past experience with scientific literature and their understanding of the NOS.

Semi-structured interviews were conducted and video-recorded with three students. The teacher-researcher asked students to reflect on their experience with the research articles and to look over their pre- and post- questionnaires to reflect on changes they noticed and what may have spurred those changes. The teacher-researcher also conducted a semi-structured interview with the cooperating teacher in order to receive feedback from an experienced educator and to gain her perspective on the quality and success of the lessons.

Data Analysis

The teacher researcher created a rubric to analyze student responses to identical pre- and post-questionnaires for student views on the NOS inspired by emergent themes from a holistic read-through and the work of Akerson, Hanson, and Cullen (2007), Hanuscin, Akerson, and Phillipson-Mower (2006), Jones (2010), and Lederman et al. (2002). The teacher researcher coded student reflections for evidence of critical thinking skills, and coded student interviews for common themes. They also analyzed the cooperating teacher interview to understand impressions of the study from the point of view of an experienced educator.

Results

Overall, the average change in score from pre- to post-questionnaire was slightly positive for all categories except for one, the tentative NOS, which was slightly negative. A number of themes emerged from student responses. One emerging theme was students' belief that the definitive factor that distinguishes science from other forms of inquiry is the fact that it is proven. Additionally, students generally believed that an experiment is a test, that the development of scientific knowledge requires tests, and that scientific knowledge is proven

through these tests. Students generally believed that theories change based on experiments and new information; no students considered that theories might change based on reinterpretation of data. There seemed to be confusion over the definition of a scientific theory. Nearly all students recognized that the same data could be interpreted differently by scientists because different people have different ways of thinking. Few (in fact, only one) took that a step further to acknowledge the differences in education, religion, background, and beliefs that might affect data analysis. Overall, over half the students had little to no experience reading scientific literature outside of class. Only one student reported significant science literature use, Student 9, who reported that they read scientific literature about once a day.

Demonstration of critical thinking skills increased dramatically for most students from Article 1 to Article 2. This same increase was not seen from Article 2 to Article 3, but this could be due to the fact that students did not have the benefit of class discussion and scaffolding from the teacher for Article 3. Critical evaluation and reflection on the article took on a few different forms: students asked clarification questions (e.g. How much did the study cost? How long did the results last? Were there any negative side effects?), posed questions for future research (e.g. Could this be applied to humans? Could this experiment work in a different organism?), and questioned or made assertions about ethics (e.g. What are the ethical implications? I agree with this technology, but more testing needs to be done).

Interview data revealed positive reception of APL across the board. The organizational structure was emphasized as appealing to students. According to students, learning through APL was engaging, especially as compared to other ways of learning (like through guided notes or textbooks). The cooperating teacher suggested increased use of small group discussion might be beneficial to student learning through APL.

Conclusion

Overall, the use of APL as a teaching tool did not significantly impact students' NOS understanding. Major themes did, however, emerge from student responses on the pre- and post-questionnaires. Firstly, most students believe that the definitive factor that distinguishes science from other forms of inquiry is the fact that it is proven. This is somewhat of a misconception, as science is never truly proven – scientific knowledge is based on repeatable observations of the natural world but is never proven true without a shadow of doubt. This belief correlates with the general belief maintained by most students that theories can change over time due to new

information and not because of reinterpretation of previous findings. Additionally, most students believe that this "proven" scientific knowledge must come from experimentation or tests. Alternative methods for the development of scientific knowledge, such as naturalistic observations, are not considered. Despite these themes that paint a picture of science as a very objective field of study, nearly all students recognized that the same data can be interpreted differently by different scientists because of differences in mindsets and ways of thinking in question seven. This seems contradictory to their other responses, but may suggest that framing is very important to helping students understand the NOS.

The use of APL in the classroom is an effective method for teaching scientific literacy. Scaffolding and opportunity for discussion in both small groups and with the entire class should be provided. Teaching students about the NOS requires more direct instruction than simply reading scientific articles, however, and should be explicitly stated and highlighted in context to increase student understanding. APL can serve as a teaching tool to garner interest in a topic and to engage students in critical thinking skills rather than rote memorization. The type of article may also be important for engagement – articles that explore scientific as well as ethical issues may encourage more engagement and critical analysis as well as challenge students on their preconceived opinions.

Common misconceptions of the NOS that teachers should be aware of and attempt to correct include belief in the objectivity of science. The scientific method is important, but is not a rigid structure necessary for the accumulation of scientific knowledge. Care should be taken to define the difference between hypotheses, scientific theories, and scientific laws.

Future research can be done to determine if the modifications of APL instruction combined with direct and/or scaffolded instruction on the NOS would have a greater impact on student understanding of the NOS. Additionally, further research can be done to determine what specific aspects of research articles (e.g. exploration of scientific ethics, relation to current events, relation to student interests) contribute to student engagement and critical thinking.

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