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EXAMINING THE EFFECT OF FEMALE STUDENTS' MINDSET ON THEIR APPROACH TO CHALLENGES WHEN LEARNING MATHEMATICS

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Abstract *Students' capability to persist when challenged is a prominent issue in many mathematics classrooms. Students, in particular female students, often do not persist with challenges because they hold the belief that they are not intelligent. In this paper, a Bachelor in Mathematics and Education student investigates if teaching female students about the implicit theory of intelligence, known as mindset, changes how students face challenges when learning. This action research project was undertaken as part of a teacher education programme and conducted with female students aged 15-16 years old in a post-primary classroom in Ireland. Overall, findings suggest when female students learn about the malleable nature of intelligence and, in particular, about growth mindset, they persist with challenges and use them as areas in which they can learn.*

Keywords: intelligence, growth mindset, post-primary level mathematics education, effort, challenges

Introduction

There is a common misconception that achievement in mathematics is often based on an innate ability in the subject and not linked to effort put in by a student (Ernest, 1996). Wood and Smith (1993) highlight that students in post-primary schools view mathematics as the most difficult subject in school, as a result of this they may believe only highly intelligent students will perform well in mathematics. When faced with a challenge in the mathematics classroom many students do not persist. They believe that they do not possess the innate

ability in mathematics needed to overcome the problem. This can be described as learned helplessness (Seligman, 1972).

In my teaching I have observed that many students, in particular females, hold themselves back when studying mathematics. Students limiting themselves could be explained by their belief that they are not intelligent enough. This is a learned behaviour which has shown to affect motivation and effort when completing a task that is perceived to be difficult (Seligman, 1972). I wanted to develop teaching skills to counteract this. One of the main theories I became interested in was Carol Dweck's theory of implicit view of intelligence and the growth mindset or incremental theory of intelligence (Dweck, 2000). Dweck (2007) found that this attitude could be counteracted by teaching students about mindset. She taught a group of students about the nature of intelligence focusing on the incremental theory of intelligence and the growth mindset, which promotes the idea that intelligence is not fixed. Her research suggests that when students learn about intelligence and mindset they tackle challenges as an area where they can learn. This has been seen to improve academic performance.

Accordingly, the purpose of my research was to change how students face challenges by changing how they perceive intelligence. I wanted to deduce if you can change a student's view of the nature of intelligence and if this has an effect on how they approach challenges in their mathematics learning. This led me to the research question; Can I, by teaching my students about the nature of intelligence and, in particular, a growth mindset, encourage my students to approach mathematical challenges as areas in which they can learn? The main reason for choosing this topic was that I wanted to develop teaching and learning skills that will lead my students to achieve their potential in mathematics. The research was completed in an inner city all-girls school. A four-week course on the nature of intelligence was completed with a group of eleven Transition Year students (age 15-16 years old), from a lower socio-economic background. This paper examines literature relating to the nature of intelligence, in particular, mindset and the effect this has on facing challenges in mathematics learning. A mixed-methods approach was utilised and data triangulated in order to enhance interpretations of the findings. Analyses were conducted and relevant findings are presented. A discussion on how the findings of the research relate to the current research on the topic is included. This is followed by a conclusion which outlines implications of this research, future action for further research and consideration for professional practice.

Literature Review

Intelligence has long been debated, and there is currently no formal definition. Many academics have researched intelligence and proposed definitions which vary between disciplines. One of the earliest ideas on intelligence was developed by Galton in 1883. He developed a theory based on the idea that people understood the world around them through their senses (Kaufman, 2000). Later Binet developed the concept that intelligence was a 'single global ability' (Kaufman, 2000, p.445). His research was the basis for the

development of the Intelligence Quotient and subsequently the Intelligence Quotient test (IQ test; Kaufman, 2000). Since Binet there have been many theories about the concept of intelligence. Many of these theories suggest that intelligence is an "ability". Sternberg proposes "intelligence as comprising the mental abilities necessary for adaptation to, as well as selection and shaping of, any environmental context" (1997, p.1030). The idea that intelligence is an ability has been further explored by Gardner. He suggests that intelligence is not a single global ability as previously thought by Binet, but a collection of abilities. He introduced the theory of Multiple Intelligences (MI). This theory expands intelligence into seven separate intelligences which include Verbal/ Linguistic, Visual/ Spatial, Interpersonal, Musical/ Rhythmic, Logical/ Mathematical, Intrapersonal, Bodily/ Kinaesthetic (Gardner, 1983).

Dweck and Leggett (1988) developed the implicit theory of intelligence. This theory refers to a person's underlying belief about the nature of intelligence. There are two main beliefs about the nature of intelligence. These are the entity and incremental beliefs. The entity view promotes the idea that intelligence is fixed and cannot or will not change over time (Rattan, Good & Dweck, 2012). Conversely, the incremental view suggests that intelligence is malleable and can be moulded and changed over time (Butler, 2000; Heslin, Latham, & Vandewalle, 2005; Plaks, Stroessner, Dweck, & Sherman, 2001). Dweck (2007) suggests that a student's implicit view of intelligence affects their attitude towards learning. She researched students with both an entity view and an incremental view of intelligence and their attitude towards learning. From this research, she developed the theory of mindset. This consists of two concepts of how people view intelligence; The Fixed Mindset and The Growth Mindset.

If a student adopts the entity view of intelligence, believing intelligence is fixed, they have a rigid view of their own intelligence, a fixed mindset (Dweck, 2007; 2012). Dweck proposes that these students see a failure as a knock to their ego. As a result, they are less likely to examine failures or see them as areas where learning could be achieved. Dweck observed that the students with a fixed mindset were less concerned with learning. She suggests that these students attribute effort to a lack of ability and being less intelligent. If failing in mathematics, these students tend to believe one of the many myths about mathematics, such as "some people have a mathematical mind and some don't" (Lane, 2012, p. 32). Dweck also notes that students can adopt a Seligman's (1972) 'helplessness attitude' towards learning. A helplessness attitude is a learned behaviour which has shown to affect motivation and effort when completing a task that is perceived to be difficult. A helplessness attitude is seen in students who believe they are not smart enough to complete a task (Dweck, 2007). In contrast to this Dweck (2007) suggests, if a student adopts the incremental view of intelligence, believing that their intelligence is malleable, they will be more motivated and tend to apply more effort and achieve better. The incremental view suggests that students have a better outlook on learning. The belief that they can improve or enhance their intelligence helps them to see failures as opportunities to

improve their knowledge and understanding and not as a knock to their ego. These students typically hold a growth mindset (Dweck, 2012). Lucas and Claxton (2010) also adopt the concept of malleable intelligence. They propose that intelligence is linked to 'learning dispositions' which can be learned.

Table 1: Fixed Mindset v Growth Mindset

	Fixed Mindset	**Growth Mindset**
Perception of own intelligence	Rigid. Can not change overtime.	Fluid. Can change overtime.
Perception of failure	Knock to ego. Personal defeat.	Area to be improved. Strive to do better.
Perception of mistakes	Reafirms lack of ability.	Opportunity to learn.
Perception of Effort	Shows lack of ability.	A path to success.

From Table 1 it is evident that students with a growth mindset see obstacles in their learning as a challenge and strive to do better. These students see success as stretching themselves. Whereas students with a fixed mindset see failure as a personal defeat. They do not believe that they can learn from failure and are interested in succeeding or looking like they have succeeded (Dweck, 2012). These ideas can be seen in the mathematics classroom as "students' self-efficacy for mathematics may be defined as their judgements about their potential to learn the subject successfully" (Tait-McCuthcheon, 2008, p. 512). It is important to teach students to see obstacles as areas of improvement. To achieve this, teachers must promote the idea that failure in a topic is an area where you can learn and not solely a negative outcome (Dweck, 2012). To promote a growth mindset, the teacher should encourage and promote effort and not solely achievement. Tanner and Jones (2003) suggest that the development of a student's self-concept in mathematics should be reinforced and encouraged by the student's mathematics teacher. Without this positive reinforcement and encouragement, the student will develop a lack of self-efficacy. Their study showed a direct correlation between success in mathematics and self-efficacy in mathematics. However, Dweck (2016) is quick to highlight that it is not just about praising effort. It is important that students try new strategies and are supported by others (e.g. the teacher, peers) when they encounter challenges in their learning. Accordingly, it is important that students are made to feel good but an emphasis also has to be placed on learning/improving. Therefore, it is important that a *sturctured programme* is in place to support students in the development of a repertoire of approaches when faced with challenges in learning (Dweck, 2016).

Research demonstrates that when females are informed, and a growth mindset framework is utilised, that they can do as well as others in mathematics and other subject areas (Good, Rattan, & Dweck, 2012). This is particularly important in terms of decreasing achivement

gaps between males and females. Specifically, research has highlighted the importance of supporting females in deconstructing conceptions relating to innate talent, as relating to mathematics and science, ad emphasising the importance of effort and self-imporvement (Good, Rattan, & Dweck, 2012). This is particular in important in the context of this study given that it was designed and undertaken with a group of 11 females from a lower socio-economic background.

There have been some critics of the implicit theory of intelligence. Furnham, Chamorro-Premuzic and McDougall (2003) did not find a significant relationship between entities versus incremental belief and academic performance. There has also been some discussion on whether the change in mindset can be maintained by the student long term. Other studies highlight the benefits of teaching about the growth mindset but they also note that further intervention may be necessary for long term effects (Aronson, Fries & Good, 2001; Blackwell, Trzesniewski & Dweck, 2007). In-fact Dweck herself has raised this point.

A student's perception of intelligence and, in particular, their own intelligence is an important factor into how they approach learning. It has been noted from Dweck's research that students with a growth mindset approach difficulties when learning as a challenge and are more motivated to learn. In particular, when the growth mindset is promoted in the classroom this encourages students to be more motivated to learn. Dweck has shown the benefits of teaching students about the nature of intelligence and the growth mindset. With this in mind I have developed my research question: Can I, by teaching my students about the nature of intelligence and, in particular, a growth mindset, encourage my students to approach mathematical challenges as areas in which they can learn?

Methodology

Eleven female participants in total took part in the research. All of the participants were in Transition Year (TY - year 4 of post-primary education in Ireland) in a small, inner-city, all girls post-primary school in Ireland. DEIS status has been awarded to the school.

This action research was conducted using a mixed methods approach, with both quantitative and qualitative methods of data collection. I utilised varied data collection instruments when gathering my data. Multiple perspectives were sought in order to facilitate triangulation of data and interpretation of findings (Pine, 2009). The data collection tools are discussed below.

Course Implementation. The research was conducted over six weeks. The students were encouraged to explore their idea of intelligence and how they approach challenges. Throughout the six weeks, a student-centred approach was utilised to teach mathematics.

The following are the specifics implemented in relation to teaching about the nature of intelligence and developing the students' mindset.

Week 1 – Questionnaire and puzzle (discussed below).

Week 2 – Introduction to the nature of intelligence.

Week 3 – Watched Carol Dweck's TED talk and explored Dweck's idea of Mindset.

Week 4 – Completed puzzles individually, discussed how to persist when challenged.

Week 5 – Examples of people with a growth mindset and what they have achieved.

Week 6 – Questionnaire, puzzle and interview (discussed below).

Data Collection Tools:

Questionnaire*:* The questionnaire assessed each student's view of the nature of intelligence and mindset at both the beginning and the end of the course. The questionnaire utilised Dweck's online questionnaire to assess mindset (Dweck, 2006). Eight of these questions assessed participants' implicit theory of intelligence (4 growth mindset and 4 fixed mindset). To answer these questions students ranked their opinion from strongly agree to strongly disagree. A high score represented a better understanding of the idea of the nature of intelligence. Along with Dweck's questionnaire, I used qualitative questions, such as "What is intelligence?", to assess the participant's idea of the nature of intelligence. The questionnaire collected both quantitative and qualitative data.

Puzzle: A puzzle was used as my artefact, this assessed how the students faced challenges. The students completed two different puzzles one at the beginning and one at the end of the research to monitor changes in how they approach challenges. This was achieved by measuring the time the students spent at the puzzle. Each puzzle was a mathematics question set at the same level accordingly in line with the Irish mathematics curriculum and standards. This collected quantitative and qualitative data.

Critical friend: An observation by my critical friend, a mathematics teacher with five years experience. She provided an insight into the validity of my teaching strategies. This is qualitative in nature.

Interview: The interview was conducted after the course was completed. The inverview consisted of 13 questions, see appendix 1. These questions aimed to evaluate a change in the students' idea of the nature of intelligence, mindset and how they approach challenges. I interviewed two students, one from the higher mathematics stream and one from the lower mathematics stream in order to get a representation from both levels of mathematics. This interview collected qualitative data.

Data Analysis

On collecting the data I organized it in a coherent manner. After this, I analyzed the data. When analyzing the qualitative data I followed the constant comparative method (Wellington, 2015). Initially I divided the data into codes. These codes were then grouped into categories. To assimilate the data I revisited it. After this I ensured that I had grouped the data correctly. Following this I made sure the categories were exhaustive and mutually exclusive. Finally, I integrated the categories (Wellington, 2015).

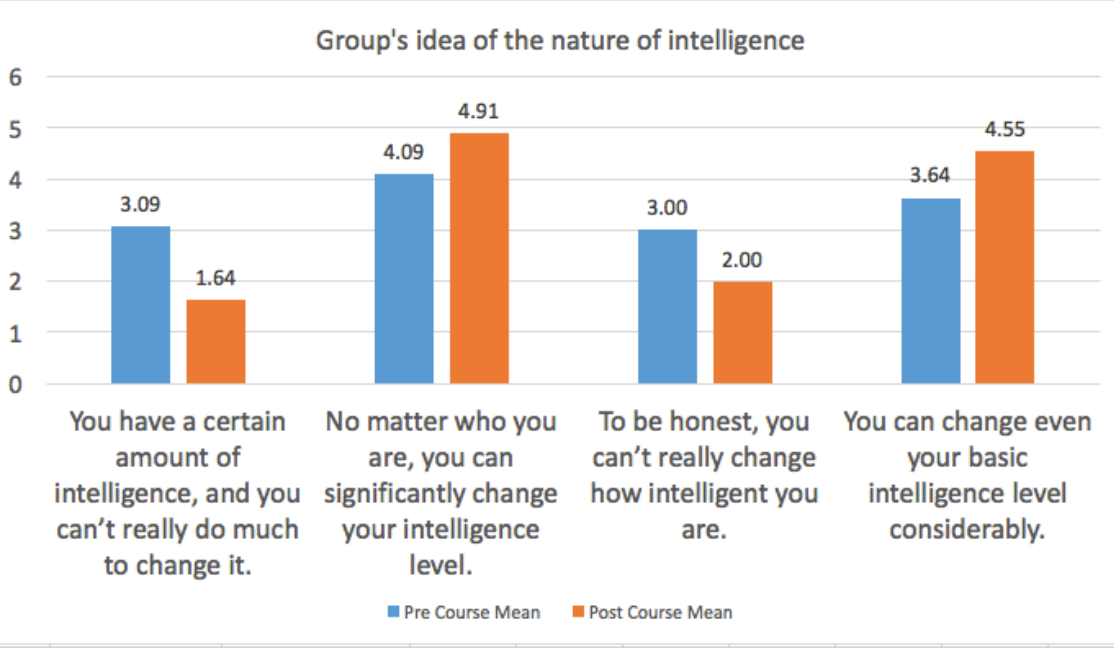
When analyzing the quantitative data, I inserted all of the numerical data into Microsoft Excel and descriptive statistics were utilised to present the data. The growth mindset questions were scored as follows; Strongly Agree 6, Agree 5, Mostly Agree 4, Mostly Disagree 3, Disagree 2, Strongly Disagree 1. The fixed mindset items were reverse scored. A score for the participants' idea of the nature of intelligence was calculated from the items. A score of 8 (i.e. 8 x score of 1 for each of the questions) indicates a Fixed Mindset and a score of 48 (i.e. 8 x score of 6 for each of the questions) indicates a Growth Mindset. Therefore, when analyzing the questionnaires, a high score indicated a growth mindset and a low score was related to a fixed mindset.

Throughout the research all efforts were made to ensure reliability, validity and ethical considerations in line with the National University of Ireland, Galway (NUI Galway) code of conduct.

Results

View of the Nature of Intelligence and Mindset. An analysis of the group's pre and post course idea of the nature of intelligence was carried out. All students' scores were added up and then divided by 11 in order to calculate a group mean score on the mindset questionnaire. Over all there was an increase in the group's idea of intelligence from a pre course mean of 29.18 to a post course mean of 35. This increase indicates a small increase in the group's idea of the malleable nature of intelligence. Figure 1 below displays students' answers to four of the questions asked in the pre and post-course questionnaire to identify their idea of intelligence, with the mean group response indicated.

Figure 1: Change in groups overall idea of the nature of intelligence.



In the graph above a score of a mean of 1 indicates the group strongly disagreed with the statement and a score of 6 indicates the group strongly agreed with the statement. The above graph indicates that students changed their idea of the nature of intelligence after completing the course. For example, in question one 'You have a certain amount of intelligence and you can't really do much to change it', the students disagreed more with this statement on completion of the 6 week program.

Some of the students' pre-course answers to the question, "what is intelligence," are as follows. Student A described intelligence as "everyone is born with a different type of intelligence, it's the area where they stand out in such as, music, art, numbers, physics." While Student B described intelligence as "everybody is intelligent but in different ways some people are intelligent at maths but terrible at music." Student C described intelligence as a measurement of "how much you know." Many of the students expressed the view that intelligence is smartness. Student D's description was "I think intelligence is when someone is smarter than someone else."

In the post course interview Student E described her idea of intelligence pre-course.

Interviewer: What did you think about intelligence before the course?

> Student E: That it's about being smart, and that you just kinda know everything without even trying.
>
> Responses from the post-course questionnaire reflected a more incremental or growth view of intelligence. Student C described intelligence as "a form of knowledge and talent … everyone with different aspects of intelligence and it expands."

In the post course interview Student E described her idea of intelligence post-course.

> Interviewer: What do you think now (after the course), has it (your view of intelligence) changed?
>
> Student E: Yeah it definitely has changed. Intelligence isn't just about being smart. It's about trying to learn more. I guess, like to expand your mind to be open to other things as well. Even if you don't like something to try and understand it.

Table 2 indicates the number of students displaying a growth, mixed or fixed mindset.. It is worth noting that the post-course shows no member of the group had a fixed mindset. Overall, the findings suggest that post-course results indicate the students held more of an incremental view of the nature of intelligence and that there was also a positive change in mindset. This may raise some questions around the sample of students who participated in this course. These students were in a disadvantaged inner city school and it may be that this was the first time that they participated in such an initiative focused on their mathematical development. Also, these students were in TY of their post-pirmary studies which affords them an opportunity to engage with both educational and work experiences throughout the year. Moreover, it is designed to be a non-exmained year and emphasis is placed on a broad educational experience.

Table 2: Mindset of group pre-course and post-course

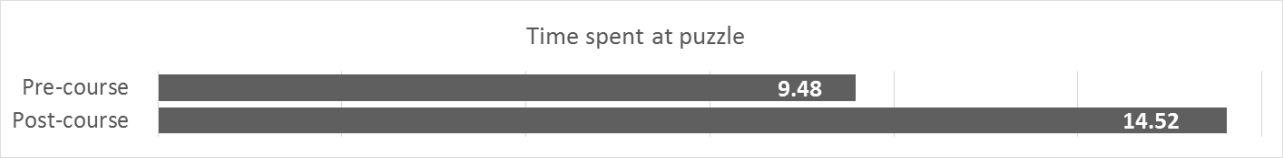
	Growth Mindset	Mixed Mindset	Fixed Mindset
Pre-course	8	1	2
Post-course	10	1	0

Challenges when learning:

How students approach challenges in their learning was measured pre and post-course.

Figure 2 below shows the length of time the students spent on the puzzle given pre-course and post-course. An increase in the length of time spent at the puzzle is seen in the post-course time.

Figure 2: Time spent on puzzle

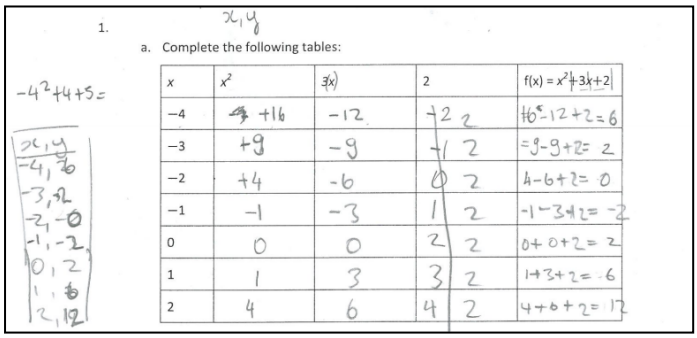


The students who completed the interview commented on how they will now face challenges when completing the state examinations or during their life in general.

> Student F: Yeah you won't have a negative mind about the question before that, you won't give up half as easy as you go through the next question.
>
> Student E: I am a very negative person anyway, so I think that this will change my perspective to be more positive and just instead of saying I can never do this is too hard I'll just say I'll try. I can't do this now.

Figure 3 below, shows student G's post course puzzle. This sample of student work shows how student G did not stop when they made a mistake and persisted with the question.

Figure 3: Student G's work on puzzle 2


1. x, y

a. Complete the following tables:

x	x^2	$3x$	2	$f(x) = x^2+3x+2$
−4	+16	−12	+2 2	16−12+2=6
−3	+9	−9	+1 2	=9−9+2= 2
−2	+4	−6	0 2	4−6+2= 0
−1	−1	−3	1 2	−1−3+2= −2
0	0	0	2 2	0+0+2= 2
1	1	3	3 2	1+3+2= 6
2	4	6	4 2	4+6+2= 12

$-4^2+4+5=$

x, y
−4, 6
−3, 2
−2, 0
−1, −2
0, 2
1, 6
2, 12

These findings suggest that post-course results indicate the students may have approached challenges as areas where they can learn after completing the course.

Teaching Strategies. My critical friend highlighted areas of strength and areas that could be improved in my teaching. She noted the student-centred teaching approach that I implemented in the classroom. In particular, my use of discussion of the topic commenting that "the use of discussion and questioning in the classroom has helped the students understand the topic" (16/11/2015).

In the post course interviews both Student E and F agreed that they enjoyed the teaching methods used throughout the course.

> Interviewer: What was good about the course?
>
> Student E: Watching the video, I think it was one of the first ones, explaining what the difference was between growth mindset and fixed mindset. That was really good I liked that video, I dunno because it was so like informative but not in a boring way, I guess.
>
> Student F: I liked the ending, you know when you like do the problem just like you know when like when you do the problem at the start it would annoy you then you couldn't do something but then when you do it in the end you could just move on it doesn't bother you half as much

The data suggest that the use of student-centred learning helped the students to learn about the nature of intelligence.

Longevity of the Effects of the Course. My critical friend had a concern about the long term benefits of the course, suggesting that the premise of the course may be forgotten over time, if not reinforced. This was also noted in the post-course interview with Student E and F.

> Interviewer: Did you find the course helpful?
>
> Student F: Yep.
>
> Student E: Yeah definitely.
>
> When asked if they had tackled challenges differently the answers were as follows.
>
> Student E: Maybe I have without knowing, but right now no.
>
> Student F: I have not, apart for the challenge at the end. Like it doesn't bother me half as much if I miss a question now.

These findings suggest that the students found the course helpful but there are questions about the long term benefits.

Discussion

This research investigated whether learning about intelligence and, in particular, mindset through a student centered approach would encourage a growth mindset. It also studied if mindset impacted students' approach to challenges, specifically if they approached challenges as areas in which they can learn. The findings from the questionairre and the puzzle suggest that learning about the nature of intelligence and mindset has led the students to approach challenges as areas in which they can learn. These findings are in line with Dweck's research on the connection between student's adopting the incremental theory of intelligence and their attitude to effort (Dweck, 2007).

My research suggests that the students' pre-course view of intelligence tended towards Sternberg (1997) and Gardner's (1983) theory, that intelligence is an ability. I find this result interesting as I was expecting the students to have a classical view that intelligence as a measure of mental ability. This aspect of the students' view of intelligence did not change over the course of the research.

Findings from the research show a change in the students' perceptions of the nature of intelligence and students' mindset. The qualitative data showed a change in the student's idea of the nature of intelligence, from an entity view, describing the idea that intelligence was "how much you know", to the incremental theory, describing intelligence as "…everyone with different aspects of intelligence and it expands". This suggests that the students have adopted the incremental theory of intelligence, that intelligence is malleable and can change over time (Butler, 2000; Heslin, Latham, & Vandewalle, 2005; Plaks, Stroessner, Dweck, & Sherman, 2001). With this change in how they view the nature of intelligence came a change in the students' mindset. Moreover there was not a large change in the student's mindsets, but in the post-course analysis of mindset there were no students with a fixed mindset. These findings are in line with Dweck's (2007) findings. Also, given that this was undertaken with an entirely female sample, and in the context of mathematics eductaion, this may have a significant impact on how students perceive their mathematics ability for future studies (Good, Rattan, & Dweck, 2012). With this in mind it is important to recoginise the limitations of this study such as the small sample size of 11 and the short time frame of the study.

The research found that there was a change in how the students approached challenges. This can be seen throughout pre-course and post-course analysis of the findings and the students' description of challenges in the interview. Both students agreed that how they will face challenges has changed. One stating she "won't give up half as easy." This result is also seen in the change in the length of time the students spent on the puzzle pre and post-course. From the example of the students work in figure 3, you can see that the student learned from her mistakes. From these findings I believe that the students were stretching themselves and seemed to approach challenges as areas in which they can learn. This

correlates to Dweck's findings that students with a growth mindset believe they can learn from mistakes (Dweck, 2012).

I aimed to research if I could teach students about the nature of intelligence. The findings suggest that the students change their idea about the nature of intelligence. I implemented student-centred teaching approaches over the course. The data suggests that these teaching methods were effective. This was highlighted by my critical friend and in the post-course interview with the students. The importance of teaching students about the nature of intelligence is central to Dweck's theory of mindset (Dweck, 2012). Overall the findings suggest that I have taught students about the nature of intelligecne using a student-centred teaching approach.

The research found that the students changed their mindset but it is not clear if over time the students will revert back to their original view of intelligence. Observations from my critical friend questioned if there would be long term effects of the course. From Aronson et al.'s (2001) study and Blackwell et al.'s (2007) we see the value of teaching the growth mindset but it also highlights to have a long lasting effect further intervention may be necessary.

Conclusion

This research aimed to identify if teaching students about the nature of intelligence and, in particular, a growth mindset, encouraged my students to approach mathematical challenges as areas in which they can learn. This research was inspired by Carol Dweck's (2007) work on mindset and its benefits for learning in the classroom. The findings of my research suggest that after completing a course on the nature of intelligence the students approached challenges as areas in which they can learn. Although this was a positive result we are aware of the limitations of the research; the size of the sample, an all female sample and the short time frame of the research, and would question if these results would be maintained.

I have learned the benefits of teaching students about the implicit theory of intelligence and mindset. From my research I saw the impact this had on how students approached challenges in their learning. I believe that changing how female students approach challenges is key to helping them to achieve their full potential in mathematics. The results of the research have shown me that it is important to teach students about mindset. It has also shown me the benefits of knowing these psychological concepts. I have a greater appreciation of the importance of educational psychology in the classroom. Although the results have limitations I can conclude that teaching about the nature of intelligence is an important aspect of professional practice. It would be beneficial to conduct further research to see if growth mindset has the potential to help students learn in all subjects, not only in

the mathematics classroom. While the results of this short term research are promising, further research needs to be conducted to ascertain the long term effects of learning about mindset in the mathematics classroom.

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Appendix A

Interview Questions

1. What did you think intelligence was before we started the course?
2. Did you learn anything about intelligence, are there any specific things you have learned?
3. What did you think about ability before we started the course?
4. Did you learn anything about ability, are there any specific things you have learned?
5. Had you heard of Mindset before the course?
6. Did you learn about Mindset, are there any specific things you have learned?
7. Do you think you have changed your Mindset?
8. Do you think you have used it has it helped you with any challenges over in the last six weeks?
9. Do you think that the course was helpful?
10. Do you think the course will help as you complete your leaving cert?
11. What was good about the course?
12. What was bad about the course?
13. Would you recommend it to your friends?

Appendix B

Questionairre (Dweck, 2006)

Please show how much you agree or disagree with each statement below by ticking the option that corresponds to your opinion.	**Strongly Agree**	**Agree**	**Mostly Agree**	**Mostly Disagree**	**Disagree**	**Strongly Disagree**
Q1. You have a certain amount of intelligence, and you can't really do much to change it.	○	○	○	○	○	○
Q2. Your intelligence is something about you that you can't change very much.	○	○	○	○	○	○
Q3. No matter who you are, you can significantly change your intelligence level.	○	○	○	○	○	○
Q4. To be honest, you can't really change how intelligent you are.	○	○	○	○	○	○
Q5. You can always substantially change how intelligent you are.	○	○	○	○	○	○
Q6. You can learn new things, but you can't really change your basic intelligence	○	○	○	○	○	○
Q7. No matter how much intelligence you have, you can always change it quite a bit.	○	○	○	○	○	○
Q8. You can change even your basic intelligence level considerably.	○	○	○	○	○	○

What is intelligence? Answer this question in the space below.

CHALLENGES OF MEETING THE NEEDS OF GIFTED STUDENTS WITHIN AN RTI SYSTEM

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Abstract Response to Intervention (RtI) and Multi-Tiered Systems of Support (MTSS) have gained popularity as methods for meeting the needs of students in the United States and other countries throughout the world. The purpose of this study was to assess pre-service teachers' knowledge of and confidence in RtI/MTSS implementation. Participants were 116 pre-service teachers. While some of them had heard about RtI/MTSS, most did not have the necessary knowledge and skills to successfully implement these systems and reported little confidence in their ability to do so. Implications for in-service training and teacher preparation programs are discussed in light of the findings.

Keywords: Response to Intervention; Pre-service teacher education; Multi-tiered Support Systems

Introduction

School districts all across the country are beginning to incorporate the Response to Intervention (RtI) model into their classrooms. In 2011, approximately 94% of schools reported implementation of RtI at some level (as cited in Castillo & Bastche, 2012). RtI is a multi-tiered approach used to effectively differentiate material for all students. The model incorporates increasing intensity of instruction; offering specific, research-based interventions matched to student needs; needs that are determined by administration and analysis of formative assessment. As a teacher in a district that has implemented this model, I have come to realize how beneficial the system can be for students who struggle; however, I have also become aware of how little I was giving my "gifted" students and my students who already understood the material. When a formative assessment shows that a student understands the material, they can stop becoming the focus of our attention. Instead, teachers tend to focus on re-teaching students who do not show proficiency on the

formative assessment, and this is a disservice for the students in our classrooms who understand the material.

For the purpose of the research study, the term “gifted” describes students who are above average in general education settings. These students read at grade level or above; write at grade level or above; and do not have a problem with attendance. These students may be ready for Honors/Advanced Placement (AP) or just below the ability level that is required to succeed in Honors/AP. They are the students who are commonly “bored” in the regular education classroom because the content is not challenging enough. When a formative assessment shows that a group of students already understood the material, I am unsure what to do with them while I teach the skill to the students who do not understand the material.

In this school, RtI is set up for underachieving students, not students who are ready for more complex thinking. When a teacher gives a formative assessment and realizes that a group of students do not understand the skill, the RtI process begins. Because the RtI model is not always designed to challenge gifted students, the gifted students might begin to underachieve in the general education classroom (Ritchotte, 2015). The goal of this project is to investigate how teachers within the high school English Department at my current school district challenge gifted students within the RtI setting. As a teacher, I struggle to develop more complex activities for students who show mastery of a skill on the first formative assessment given. The purpose of this research is to investigate how colleagues incorporate “enrichment” or more complex activities into the three-tier RtI system to challenge the gifted students.

Literature Review

Response to Intervention for Gifted Students. The RtI system is designed to help teachers identify learning or skill deficits and provide structure to assist teachers in making curriculum accommodations for those learning deficits. This tiered approach, however, stops once a student has mastered a skill. There is a lack of research in the role of enrichment within RtI, which implies that few researchers are looking into this topic. Most research has been done on the benefits of RtI for lower achieving students, and research has also been done on describing what giftedness is. However, minimal research has been done on how the two might coincide. While researchers have investigated how to challenge gifted students, few researchers have studied how to challenge or “enrich” students within the three-tiered RtI system.

Even though few have published studies on the impact of RtI systems on gifted students, there is evidence that these students are in need of differentiated instruction. Johnsen,

Parker, and Farah (2015) found that advanced students may have already learned some of the basic concepts that are taught to general education students. If they have already learned the basic skills, they may need curriculum compacting or alternative learning experiences that challenge them to think at a higher level. If students learn the basic skills at a faster rate or have already learned the skills, then teachers that implement the RtI system will have a plan to challenge those students. At this time, the published RtI literature does not emphasize promoting intense instruction for students who learn the skills and concepts at a faster rate; however, this can happen within the general education, RtI framework. Research has found, though, that teachers do not feel prepared to do this. One study found that numerous teachers believed giving gifted students extra challenges and support is important, but are unsure of how to put it into practice or are unable to fit the extra challenge and support into the mandated curriculum or intervention design (Ryan & Coneybeare, 2015). This research exemplifies the need to find a way to educate teachers how to enrich gifted students, and RtI is a framework that may provide a supportive structure for teachers to deliver enrichment to gifted students.

What little research that has been done on enrichment in within RtI has found that gifted and talented students are getting a disservice from schools in this current set up. Seedorf (2015) found that only a small percentage of current students benefit from the RtI program as it is most often being used as a way to identify and serve students with special needs. Seedorf (2015) suggests that a paradigm shift needs to take place in how we identify and develop programs for students with special needs. Similarly, Miller and Gentry (2015) found that talent among high-potential students from low- income families often goes unnoticed without support and encouragement from educators. In addition to this, Horne and Shaughnessy (2015) discovered that the gifted student is often times left out of the RtI process. Horne and Shaughnessy (2015) also found that many public schools remain ill-equipped to meet the needs of the population of gifted and talented learners within their school systems. They discovered that few educators and professionals have the necessary training to not only identify gifted learners, but the ability to effectively challenge them as well. There is little research on how to use the RtI system to meet the needs of the gifted students.

Current Curriculum Models for Gifted Students. Although no systematic, extensive studies have examined how gifted students are best served within the RtI framework, there are curriculum models similar to RtI that have research supporting the idea that gifted students benefit a tiered framework. The Purdue Three-Stage Enrichment Model (Moon, Kolloff, Robinson, Dixon, & Feldhusen, 2009) is a model of enrichment where student skills are matched with varying levels of instruction that start with the development of critical thinking skills and move to inquiry-based learning and generalization of those skills to community projects. According to Johnsen et al., (2015), this model has been used in a variety of schools and Saturday enrichment programs, and was successful. Another approach to enriching the curriculum is the Levels of Science (LOS) approach (Treffinger,

1986). According to Johnsen et al., (2015), similar to RtI, it offers services at varying levels of intensity. LOS services range from AP courses accelerating grade level content to AP courses and job shadowing.

Aside from these few models similar to RtI, there is very little research that examines how gifted students fit into the RtI model; however, the research that has been published is positive. One study found compelling evidence that RtI is an educator's best hope for giving students support and additional time that is needed to learn at high levels (Buffum et al., 2010). Werts, Carpenter, and Fewell, (2014) discovered that 72.76% of focus group statements noted that students were receiving a higher level of instruction because of RtI. If we want all students, including those who are gifted, to learn at their highest level, then more educators need to consider RtI as a way to ensure all students receive instruction matched to their needs. However, the focus of RtI decisions, in the classroom and in the literature, remains on struggling learners with gifted learners often being left to underachieve. Given the lack of attention to the importance of utilizing RtI to meet the needs of gifted students, the goal of this project is to bring attention to this issue. Through this qualitative action research we aim to answer the following research question: to what extent do teachers in a focus group made up of secondary English Language Arts instructors feel frustrated with how gifted students are receiving instruction within the general education, RtI setting. I hypothesize that these educators are frustrated and that this is because students are bored with the material and teachers do not have time or the knowledge of strategies to develop additional lesson plans that will challenge this group of students.

Methodology

Participants. Participants were in-service general education and special education educators who served as co- teachers in the general education setting. The two special education educators were included in the study because the English department utilized a collaborative co-teaching model in their inclusive classrooms. The special educators helped plan lessons, lead instruction, and assess all students in the classroom. In total, eight educators from the English department at Clinton High School in Clinton, Iowa were recruited to participate. Clinton High School has 1,100 students and is considered a large school district in Eastern Iowa. The educators' experience levels range from a first-year educator to a veteran teacher. The participants were recruited through a written request for their participation. The participants were told that their names would remain anonymous.

Approximately 93% of participants were female. All educators that participated in the focus group have been born and in raised in the Midwest region of America, and their teaching experience is limited to Iowa school districts. Five of the participants had Master of Arts degrees from various Midwestern universities. The remaining participants had Bachelor of

Arts degrees from various Midwestern universities. All of the participants knew each other as they work in the same department in the same school district.

Focus Group Questions. Creating mediator questions can be one of the most difficult pieces of conducting a focus group study. The questions should guide discussion. They should be focused, and they should encourage open conversation between group members. The questions should provoke honest responses from the group members (Hatch, 2002). The focus group questions for the group of high school English teachers are listed below.

- How do "gifted" students fit in to your regular education setting? What role do they play in classroom instruction/activities?
- What challenges do having "gifted" students in a regular education setting present?
- What kinds of strategies do you use to challenge these students in the RtI setting?
- Where did you learn about these strategies?
- How do you incorporate enrichment into the RtI setting?
- What has been the best way for you to challenge "gifted" students in your general education (RtI) classroom?
- Who/what do you look to for advice for what to do with "gifted" students in the RtI setting?
- What more can the school do to help serve "gifted" students in the RtI setting?
- Is the school's current solution (pushing them into Honors/AP courses) working?
- What effect has switching to teaching the Iowa CORE curriculum (https://iowacore.gov/) had on "gifted" students?

Design and Procedures. For the purpose of gaining information on enrichment for gifted students within the RtI framework, a qualitative research design was utilized. Qualitative research allows the researchers to understand what participants are thinking (Krueger, 1988). A qualitative research design will allow for a better understanding of the feelings, values, and perceptions that underlie and influence the English department's teaching practices. The specific type of qualitative research that was used is a focus group. Focus group research is a way of collecting qualitative data, which involves holding a group discussion with a small number of people in an informal setting. The discussion is based around a particular set of issues (Onwuegbuzie, Dickinson, Leech, & Zoran, 2009). According to Baumgartner, Strong, and Hensley (2002), focus groups usually last between one and two hours and consist of 6-12 participants. The researcher acts as the facilitator to keep moving the group discussion forward. According to Krueger (1988), focus groups allow for more candid and open responses than that of a survey. Participant informed consent was obtained in writing. Participants were placed in focus groups based on their current teaching position as high school English teachers at the district under study.

Data Analysis. The researcher used an inductive analysis approach to analyze the data. According to Hatch (2002), "Inductive thinking proceeds from the specific to the general" (p.161). In other words, the researcher started by looking at specific elements within the transcriptions and then the researcher found connections between those elements. Inductive analysis is, overall, a search for patterns of meaning within data that has been collected. According to Hatch (2002, p.162), there are nine steps to following when doing inductive analysis. They are as follows:

Step one: Read the data and identify frames of analysis. This process of data analysis begins by repeatedly reading the data because each time the data is read, new insights are made. The first question the researcher should ask when approaching the transcription is: *What will be my frames of analysis?* (Hatch, 2002). For this research study the initial frames were the following: *Conversations related to defining "giftedness;" Conversations related to strategies; Conversations related to the current system in place; and Conversations related to interests in professional development.*

Step two: Create domains based on semantic relationships discovered within frames of analysis. The goal of this step is to create categories of meanings or what Hatch (2002) calls, "domains," that reflect overall relationships that are represented in the data. Discovering domains gives researchers a way of getting at how participants organize their understandings and schema. As the inductive analysis progresses, these categories will become more specific.

Step three: Identify salient domains, assign them a code, and put others aside. This is the stage in which preliminary decisions are made as to which domains will be important to further examine and which ones will not. Once the researcher has decided upon salient categories, each category should be given a code. For this study, roman numerals were used to label each domain, and letters were used to label sub points for each domain.

For this research study, the following codes were established in this stage of the data analysis:

I. Defining gifted students in the general education setting

- a. "Will" students—student who do poorly due to lack of effort
- b. "Skill" students—students who do poorly due to lack of knowledge or skill

II. Difficulties of having gifted students within the RtI setting

- a. Boredom
- b. Lesson planning
- c. Classroom management
- d. Challenging them
- e. The current system of RtI

III. Strategies used to enrich gifted students within the RtI setting

a. Enriching Iowa CORE standards

b. Rigor vs. More Work

c. Bloom's Taxonomy

d. Reading Lexile- a framework for matching readers with a text of the same scale

IV. Desired Professional Development

a. No one to turn to

b. Applicable strategies

c. Re-thinking curriculum

Below Table 1 details the preliminary domains that were important to further examine.

Table 1: Step Three: Identify Salient Domains. Assign them a Code, and Put Others Aside

Domain	***Thematic Domain***	***Characteristics of Domain***
Domain I	Defining gifted students in the general education setting	• "Will" students--student who does poorly due to lack of effort • "Skill" students--students who do poorly do to lack of knowledge or skill
Domain II	Difficulties of having gifted students within the RtI setting	• Boredom • Lesson Planning • Classroom Management • The current system of RtI
Domain III	Strategies used to enrich gifted students within the RtI setting	• Enriching Iowa CORE standards • Rigor vs. More Work • Bloom's Taxonomy • Reading Lexile
Domain IV	Desired Professional Development	• No one to turn to • Applicable Strategies • Re-thinking curriculum

Step Four: Re-read data, refining salient domains and keeping a record of where relationships are found in the data. In this stage, the researcher should re-read the data while keeping in mind the already established domains. In this stage of the data analysis, the researcher should seek to find similarities between different domains. Hatch states that, "The process of searching and coding within salient domains will lead you to look more closely at your data and give you a better sense of the richness and importance of the

domains you are finding" (Hatch, 2002, p. 169). It was in this stage of the research that the researcher discovered some similarities between the previously established categories. One of the similarities was that the concept of "student boredom" was found in almost every conversation. In addition to this, the idea that there is a lack of "enrichment" opportunities came up in multiple conversations.

Step five: Decide if your domains are supported by the data and search data for examples that do not fit with or run counter to the relationships in your domains. This is the stage in which the researcher determines whether or not the domains are supported by evidence. Up until this point, the data analysis was hypothetical. This is the stage in which the researcher must ask whether or not there is enough data to support including the domain. The researcher must also determine if there is data that does not fit in the expressed domains. After completing this stage of the data analysis, the following categories were removed: II.D: *Lesson Planning;* III.d: *Reading Lexile*; and IV.c: *Rethinking Curriculum.*

Step six: Complete an analysis within domains. According to Hatch (2002), completing an analysis with domains means revising the data that has already been collected in order to find new semantic relationships and discover new ways to organize the data. The researcher looks within the data in this stage in order to fill in missing blanks of information or develop new understandings. The complexity of the initial outline will expand in this stage. After going back through to re-examine the domains, a new outline was developed. Below is the modified version of the outline.

I. Defining gifted students in the general education setting
    a. "Will" students
        i. Lose the "will" when content and levels of thinking get easy
        ii. It is difficult to find ways to motivate students to maintain a "will"
    b. "Skill" students
        i. We commonly think of "skill" students as "skill-deficit" students; not "skill-equipped" students
        ii. We struggle to match skill to content
II. Difficulties of having gifted students within the RtI setting
    a. Boredom
    b. Lesson planning
        i. We have to plan three lessons for every class period—too much to do in our allotted prep time

ii. Once we establish “proficient” criteria we never establish “enriched” criteria—this needs to happen

iii. Aligning difficult content to a skills-based class is difficult

c. Classroom management

i. This aligns with the boredom statement about and should be put with that

ii. Best way to differentiate is in small groups; what are the logistics of that

iii. Should we group all gifted students together or is it better to intermingle them with other students

d. The current system of RtI

i . Three tier system is designed to help our failing students

ii. We only have interventions for students who have not mastered the skill

iii. The current system allows gifted students to put off work because we do not count it late

iv. Neglecting the gifted

III. Strategies used to enrich gifted students within the RtI setting

a. Enriching Iowa CORE standards

i. Looking ahead a grade level

ii. Using reading Lexiles

iii. Using ACT readiness guidelines

iv. Options for going cross-curricular

b. Rigor vs. More Work

i. The difference between the two terms

ii. More work is “easier”, thus it happens more

iii. More problem/inquiry based collaborative learning is needed

c. Bloom’s Taxonomy

i. The last two tiers of Bloom’s are what we should use

ii. Do we scaffold gifted students the same way

iii. Using question stems

IV. Desired Professional Development

a. No one to turn to

i. We can turn to: Department heads, PLC leaders, Administration; but no one outside of the district

ii. All responders listed their PLC leader as the only person they go to

iii. We could use more help from outside sources

iv. It would be nice to visit other schools to see how they do it

v. We really need a talented and gifted coordinator

b. Applicable strategies

i. We want a list of hands-on strategies we can use in the classroom

ii. We need common vocabulary

iii. More teacher-training on how to enrich the Iowa CORE standards

iv. We need to re-think our curriculum-writing process

Below Table 2 displays the revised, more complex data.

Table 2: Step Six: Complete an Analysis within Domain

Domain	*Thematic Domain*	*Characteristics of Domain*
Domain I	Defining gifted students in a general education setting	a. "Will" Students • Lose the "will" when content and levels of thinking are easy • It is difficult to find ways to motivate students to maintain a "will" b. "Skill" students • We commonly think of as "skill-deficit"; not "skill-equipped" • We struggle to match content to skill
Domain II	Difficulties of having gifted students within the RtI setting	a. Boredom b. Lesson planning • Have to plan three lessons for every class period--too much in given time • We establish "proficient" criteria; we never establish "enriched"

		criteria • Aligning difficult content to a skills-based class is difficult c. Classroom Management • This aligns with the boredom statement about and should be put with that • Best way to differentiate in small groups; what are the logistics of that • Should we group all gifted students together or is it better to intermingle them with other students d. The Current System of RtI • Three tier system is designed to help failing students • We only have interventions for students who have not mastered a skill • Neglecting the gifted
Domain III	Strategies used to enrich gifted students within the RtI setting	a. Enriching CORE standards • Looking ahead a grade level • Using reading Lexiles • Using ACT readiness guidelines • Optins for going cross-curricular b. Rigor vs. More Work • The difference between the two terms • More work is

		"easier"; thus it happens more • More problem/inquiry based collaborative learning is needed c. Bloom's Taxonomy • The last two tiers of Bloom's is what we should use • Do we scaffold gifted students the same way • Using question stems
Domain IV	Desired Professional Development	a. No one to turn to • We can turn to: Department heads, PLC leaders, Administration, but no one outside of the district • All responders listed their PLC leader as the only person they go to • It would be nice to go to other schools to see how they do it • We really need a talented and gifted coordinator b. Applicable strategies • We want a list of hands-on strategies we can use in the classroom • We need common vocabulary • More teacher-training on how to enrich the CORE standards • We need to re-think

	our curriculum-writing process

Step seven: Search for themes across domains. This is the stage in which the researcher looks for connections among domains. In this stage, the researcher looks for broad elements that bring the data together. As the process of inductive analysis suggests, the conclusions being made from the data are starting to become broader. From this the researcher will discover common themes. For this study, the researcher identified the four following themes:

- Challenging "gifted" students within the RtI framework is challenging
- Strategies that eliminate classroom management struggles
- Strategies to challenge "gifted" students
- Professional Development Goals

Step eight: Create a master outline expressing relationships within and among domains. In this step, the researcher will create a final, master outline that details how existing domains and subgroups fit into the overarching themes. Hatch (2002) states that if the themes do not account for all of the data, the themes should be reconsidered. The relationships that become present in the final outline will undoubtedly have a major influence on how the findings are reported.

Step nine: Select data excerpts to support the elements of your outline. This is the stage in which the researcher begins to find examples from the transcription that can be used to support the themes that have been discovered. This is the final step in data analysis before the final writing process begins.

Results and Discussion

Theme One: Challenging "Gifted" Students within the RtI Setting is Challenging. A common theme that was found throughout every focus group discussion was that reaching gifted students within the RtI framework in a general education setting is difficult. All teachers in the group came to the consensus that the gifted students were the ones that could have pushed themselves to be in the Honors/AP classrooms, but for whatever the reason, did not do so. As one teacher stated, "My gifted students are usually those who should have pushed themselves harder and taken AP, but were either too concerned about grades or too lazy to put forth the effort needed for AP." The gifted students are the ones who show mastery of a skill early on (sometimes even on a pre-test) and then require a form of enrichment while the other students are re-taught the skill. However, the challenge with this comes with finding a way to present this "extra work." One teacher, for example, stated that, "The gifted students need to be challenged without thinking they are being punished." The idea

behind challenging students within the RtI framework is to provide them with enrichment activities once they master a skill. Teachers in this study, though, found it to be challenging to find a way to present these enrichment activities without students viewing the extra work as a form of punishment. Teachers also found it challenging to find a way to present the material in a way that does not make it seem like they are doing the same skill over and over again with varying texts or levels of difficulty.

In addition to finding a way to present enrichment activities to students, keeping gifted students from becoming bored with the material was another challenge that teachers reported. Every teacher stated that their biggest challenge is finding a way to keep the entire class engaged with the material. One teacher stated that, "I think that my gifted students find many of the lessons and activities boring. Because of this boredom, they often end up playing one of two roles: the distracting student or the student who finishes everything and waits patiently for the next thing to complete. Either they are sitting around doing nothing or distracting others." Teachers agreed that the boredom led to classroom management issues like the teacher above described.

A final challenge was finding time to create these enrichment lesson plans. One teacher stated that, "These students play almost no role in instruction because we are only worried about getting everyone through the standard; we are not concerned with students reaching beyond the standard proficiency...They lose out on learning because the classroom is not designed to challenge them on a daily basis. We don't have time to create three lesson plans for every single class." The current system requires that a teacher develop a "re-teaching" lesson, a "base-level" lesson, and then the "enrichment" lesson. When teachers are so focused on making sure everyone is reaching proficiency at the skill, the "enrichment" lesson was found to be the one that was put off due to lack of time. A teacher in the focus group stated that, "Although ideally differentiation with multiple levels of activities and multiple choices for students would run simultaneously in a classroom, I have not yet perfected how one or two human beings can do so with 30+ (or even 18) students with quite a range of abilities." Like addressing the issue of boredom, finding time to create enrichment activities was a challenge that all teachers faced. As a result of this, teachers felt guilty about doing a disservice to students. As one teacher stated, "...the other main difficulty I face is my own guilt. I feel guilty, like I am cheating these students out of the education they deserve."

Theme Two: Strategies that Eliminate Classroom Management Struggles. The second theme found throughout the data was that the teachers in the group had a few strategies they used specifically to address the classroom management problems that were a result of having gifted students in the general education, RtI classroom. One strategy that the group utilizes is strategic grouping. Many of the teachers stated that they pair gifted students with students who are at a lower level in order to allow the gifted student to essentially teach

their partner. While there are limitations to this type of strategic grouping, all of the focus group members stated that it works to alleviate some of the classroom management problems that arise from having gifted students who are bored with the material. In addition to pairing, teachers suggested grouping all gifted students together for certain activities so that the rigor of the assignment can be brought up a level to challenge everyone in the group. Finally, all teachers mentioned that more rewards should be put in place for students who excel in the classroom. One teacher stated that, "They need to be rewarded more often to keep them motivated; we need to give them a reason to want to succeed in class." Teachers in the focus group agreed that in order to eliminate classroom management struggles, more rewards should be implemented in the classroom. In the current tiered RtI system, the only reward is "enrichment," which to the students is more work. Teachers need to find other ways to reward students for excelling in class; rewards that do not necessarily involve more work. Rewards could be things like open, "free-reading" time or writing time; more choice in assignments; or an extension project that is geared more for an authentic audience.

Theme Three: Strategies to Challenge Gifted Students. A third common theme was that teachers discussed a variety of different ways to challenge gifted students in the general education, RtI setting. One of the ways teachers challenge students is by increasing the rigor of the work assigned to gifted students. The teachers discussed how making work more rigorous was not the equivalent to assigning more pages to read; longer writing assignments; more practice problems; etc. Rigor requires a student to put forth more effort, not complete a higher volume of work. One way to challenge gifted students, then, is to develop more rigorous learning experiences. Three teachers said that in order to increase rigor, they do project-based learning in their classrooms. This way, the learning tasks can be differentiated for different ability levels.

The teachers in the focus group also stated that they use Bloom's Taxonomy (Bloom et al., 1956) as a way to script questions in order to more effectively challenge students. One teacher stated that she uses Bloom's Taxonomy, "...as a way to create question stems to challenge gifted students. I use Bloom's Taxonomy as a guide for moving students past lower-level thinking questions like basic recall questions." For example, if the skill is analyzing a text from multiple mediums, the teacher should refer back to Bloom's Taxonomy when developing an assessment for that skill. When looking to challenge gifted students, the teacher should look to the top tiers of Bloom's Taxonomy instead of having students do basic skills like identifying the similarities or differences between the two different mediums. Overall, one of the most prominent strategies discussed in the focus group was the strategy of using Bloom' Taxonomy as a guide for asking questions. One teacher reiterated this point when she stated, "It is all about how the teacher asks questions. They need to ask students to do more complex thinking, and that all comes back to what the teacher asks of the student."

Theme Four: Professional Development Goals. The group's first professional development goal was to simply gain access to more resources. When asked where each teacher goes to get strategies for challenging gifted students, all of the teachers said that their ideas came from other teachers in the building. Not one teacher mentioned having an outside resource. One teacher summarized this need when she stated, "I look to my co-workers and PLC for advice, and then I do the best I can with what I've got." Their hope is to attain more knowledge from outside of the department in the future in order to learn new ways to challenge students. One teacher stated, "Why not have a 'challenge teacher' in the classroom to take those gifted students to a higher level of learning? The general education teacher does not have time to take care of everyone. If we have special education teachers, we should have teachers that specialize in challenging students as well." If teachers are going to successfully challenge students in their classroom, they need a resource to go to that will help them accomplish that. The RtI system is designed in a way to provide interventions to students who fall behind, and many of the interventions include one-on-one help with a variety of teachers. The teachers in this focus group discussed the need to have the same type of interventions available for challenging gifted students.

A second professional development goal identified by the group was to have more teacher - training on finding methods to enrich the Iowa CORE curriculum. The teachers discussed a need for having a set of applicable, ready-made strategies they could put in place. One teacher stated that, "...the foundation of RtI, especially when viewing the staple pyramid diagram of the program, is based on the students who need help meeting the learning target, not those who rise above it. Furthermore, there is little to no literature out there on what to do with 'gifted' students in a classroom that is focused on teaching the CORE." Currently, the teachers spend a few days each school year writing their curriculum and aligning it to the Iowa CORE. The teachers agreed that it could be during this time that training could be done on ways to enrich the curriculum they set in place.

Discussion. The initial hypothesis investigated in the present study was: Teachers in the focus group will report frustration with how gifted students receive instruction within the general education, RtI setting because students are bored with the material and teachers do not have time or the knowledge of strategies to develop additional lesson plans that will challenge this group of students. The focus group discussions, along with the published literature, suggest this hypothesis to be retained. While there are strategies or systems of instruction out there that do provide an extra challenge for gifted students, teachers do not feel they have the knowledge or time to implement such strategies or systems of instruction.

In order to effectively challenge these students, teachers need to allocate time in their schedule to plan lessons that implement research-based strategies that challenge gifted students. One of the applicable strategies discovered was using Bloom's Taxonomy (Bloom et al., 1956) as a way to formulate questions that increases the complexity of thinking.

Bloom's Taxonomy provides question stems that will allow a teacher to almost script their lesson plans and questions in a way that will increase the rigor for gifted students. Both the literature review and the focus group pointed out that rigor is not an increase in the volume of work; it is an increase in the required effort to attain proficient completion. Sousa (2009) explains that educators should learn the difference between complexity and difficulty. Using Bloom's Taxonomy as a guide for phrasing questions and learning tasks will allow teachers to increase the complexity of thinking without necessarily adding "more work" to a learning task.

Another strategy that the focus group discussed was using project- based learning or collaborative learning as a way to challenge students within the RtI general education classroom. Through the use of effective grouping and differentiated tasks, a teacher can challenge students at their appropriate level. Essentially, a group of gifted students could complete a more challenging task while the other students in the class who need re-teaching or more interventions get that necessary instruction. In order to complete this type of group work effectively, teachers will need to set guidelines for group work in advance so students can work efficiently without the constant guidance of a teacher. Blackburn and Williamson (2009) explain that in addition to this, teachers should scaffold students of all ability levels in order to challenge them more effectively. The teachers in the focus group also emphasized the importance of making the learning tasks authentic for students, no matter what the ability level. If students are producing a project or product that is for an authentic audience, all teachers in the focus group agreed that they put forth more effort.

Finally, the teachers brought up the idea of using Lexile scores, ACT readiness standards, and the Iowa CORE standards as a way to gauge rigor of the content being taught to gifted students in a general education, RtI classroom. The teachers in the focus group suggested looking ahead a grade level at the Iowa CORE standards as a way to increase the rigor of a certain learning task. If the class is at the highest level of the Iowa CORE, ACT readiness standards can be utilized as a guide for increasing the rigor of a learning task.

Even though there were a variety of strategies and systems of instruction that have been found to challenge students, the first step in providing higher quality education to this group of students is to educate the teachers on how to do so. An overwhelming concern expressed by the teachers was that they feel ill-equipped to effectively challenge gifted students in the general education, RtI classroom. The members of the focus group felt confident in implementing the three-tiered RtI approach to learning; however, they did not feel confident in implementing the "enrichment" aspect of RtI. The focus group members discussed how they feel instruction stops once a student shows proficiency, at that point, they know how to assign "busy work" to keep them working. This lack of knowledge is due primarily to a lack of educational literature and professional development opportunities. As one teacher in the group stated, "Most literature focuses, once again, on the students who

do not meet the standard. With resources for gifted instruction in the Core and in the RtI process being so slim, it is no wonder we are having difficulties finding a place for these students in classrooms today. This needs to change soon because we are well on our way to cheating our best students and brightest hopes for the future out of a quality education." It is clear from the responses made by the group that they desire more professional development in this area. Teachers in the group also commented on a desire for more professional literature on this topic as well. Research has found that with professional development, teachers' attitudes and beliefs can be significantly altered, leaving teachers with less stereotypical beliefs about new teaching practices (Ryan & Coneybeare, 2015). If teachers are given the opportunity to learn how to better challenge gifted students, then these gifted students will receive an improved and more challenging education.

In regards to the concern of time, it is clear that teachers will undoubtedly have to put forth more time in order to effectively challenge gifted students in the RtI setting. Enrichment lessons do not create themselves, and no matter what the strategy put in place, it will require more work on the teacher's end. The focus group placed a heavy amount of concern on a lack of time to create three different lesson plans, and if this is the case, the district, department, or PLC needs to re-think the utilization of curriculum writing and preparatory times. The focus group members discussed how curriculum writing and PLC time was utilized to create assessments and rubrics. In addition to this, time should be utilized as a group to generate enrichment lessons that will challenge students to think at a higher level for an authentic audience. In the case of this focus group, it is not a lack of provided time to create enrichment lessons, rather teachers are spending the time they do have focusing on re-teaching lessons for students who do not meet proficiency. Too much of curriculum writing time is spent on finding ways to get students proficient; not finding ways to extend their learning. If teachers feel they are doing a disservice to gifted students in a general education classroom by focusing too much on the students who do not show mastery of a skill, then the teachers need to allocate more time to creating strategies that will challenge students. In order for teachers to do this, though, more professional development on how to go about challenging gifted students needs to be put in place.

Limitations

Even though the focus groups lend themselves to honest and open discussions, there were a few limitations. This particular focus group is limited to secondary high school English teachers. While the teachers have a vast array of previous educational experiences, they are limited to one content area. In addition to this, all teachers came from the same school district. While it proved to be beneficial in offering similar group knowledge on RtI and gifted students, the responses were limited to the experiences of one school district. In addition to this, the small size of the focus group may not be a good representation of the population at large.

The focus group design also comes with many strengths and weaknesses. One of the main strengths of this design is that it allows for a more broad exploration of feelings and thoughts than a simple survey would. Another strength of this design is that it allows the researcher to follow up with questions immediately. Instead of looking at survey data and then following up with questions, the researcher can be immediate in their feedback.

Implications

It is clear that more research needs to be done on how the RtI process can benefit gifted students in the general education setting. The lack of research on this issue implies that there is more work to be done in this area. Specifically, more research needs to be done on the teaching strategies that work best to challenge gifted students within the RtI general education setting. In addition to this, more research needs to be done on how teachers can more efficiently plan to meet the needs of all students. A major concern expressed by teachers in this study was that there is a lack of time when it comes to preparing three lesson plans for each skill. The teachers focus on planning lessons for students who have not mastered the skill; the needs of students who have shown mastery are put on the back burner. More research needs to be done on finding a solution that will minimize the time constraint currently put on educators. More research also needs to be done on whether or not the RtI system is actually helping these gifted students. At some point in the conversation, every teacher made a comment similar to the following one stated by a teacher in the focus group: “Some may say that RtI includes enrichment for those who need instruction above and beyond the minimum. However, the foundation of RtI, especially when viewing the staple three-tier pyramid diagram of the program, is based on the students who need help meeting the learning target, not those who rise above it.” In other words, the essential flaw of the system is that it is solely designed for students who do not show mastery. As a result, the gifted students are not receiving the necessary amount of attention. Researchers need to look further into the effects the RtI system is having on gifted students. It would be interesting to see if this system is causing a higher number of students to underachieve academically.

Conclusion

Research has shown that the RtI process, when implemented in a general education classroom, is beneficial at achieving higher student success rates for students who do not normally succeed in a general education setting (Buffum & Mattos, 2009). What research has not shown, though, is how this RtI process impacts gifted students, or students who master skills at a faster rate and are ready to move on to more rigorous learning. The teachers in this focus group discussed the frustration felt in that they feel ill-equipped to challenge these gifted students. This frustration is due to a lack of time; a lack of access to

professional development; and a lack of knowledge on research-based strategies that challenge this group of students. While the literature brings to light some useful strategies and systems of instruction that have proven to be effective in challenging students, there needs to be an effort made to educate all educators on these strategies or systems of instruction. In order to prevent underachievement of gifted students in the general education classroom, more work needs to be done on preparing teachers to increase the rigor for students in the general education setting. Matthews (2006) found that academic performance is one of the strongest predictors of a student's decision to drop out of school. In order to prevent this, administrators need to invest time in equipping their educators with the knowledge and skills they need to better help the gifted students and help them achieve success at higher levels. When schools choose to implement the RtI system of intervention, they need to consider what effect the implementation will have on their gifted students.

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AN ACTION RESEARCH STUDY ON EMOTIONAL INTELLIGENCE IN A RURAL APPALACHIAN HIGH SCHOOL

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Abstract This article presents the findings from an action research project that attempted to determine if the emotional intelligence of a group of students in a rural Appalachian high school could be significantly increased over a two week period when participating in five emotional intelligence instructional lessons. The results found that the five lessons did change these students' emotional intelligence scores but the change was not statistically significant.

Keywords: Emotional Intelligence, Instruction, Self-Science, Six Seconds

Introduction

Emotional intelligence (EI) can be traced to Thorndike's (1920) and Kelly's (1955) social intelligence, Wechsler's (1940) non-intellectual intelligence, and Gardner's (1983) two subtypes of personal intelligence: intrapersonal and interpersonal intelligence. EI is the awareness and the ability to manage one's emotions under varying stimuli and circumstances and to efficiently and positively act upon the situation (Kobe, Reiter-Palmon, & Rickers, 2001). Our emotions not only affect our ability to think, perform, and act but how we address our emotional responses to conflicting stimuli defines who we are as individuals or how others perceive us (Mayer, Salovey & Caruso, 2000). An individual with high EI are more likely to successfully manage extrinsic stressors, as a person with a high EI will most likely possess the ability and discipline to assess situations and develop positive emotional responses rather than being impulsive and/or reacting negatively (Kobe et al., 2001).

Literature Review

There has been an increased interest among researchers to examine the role that personality plays in academic performance and socio-emotional adjustment at school (Mavroveli & Sanchez-Ruiz, 2011), as past research has shown that "EI can predict success at home, at work, and at school, as well as or better than IQ" (Goleman, 1995 found in Barchard, 2003, p. 840). According to Goleman (1995), the EI of children is lower than adults and thus could negatively impact their level of achievement academically and socially. The literature supports the general premise that EI plays some role in the overall success of an individual's future success in areas that depend on social competency and personal interaction.

Researchers of EI have included variables (e.g. persistence, optimism, decision-making) based upon emotion and feelings, and participant reactions both verbally and nonverbally on all of the EI instruments (Barchard, 2003). "Openness (Intellect) and Conscientiousness, have been related to scholastic achievement…Conscientiousness effects on academic achievement are similar to that of intelligence" (Mavroveli & Sanchez-Ruiz, 2011, p. 113). There are four recognized EI models: 1) the personality model (Noftle & Robins, 2007; Grehan, Flanagan, & Malgady, 2011); 2) the competency model (Goleman, 1995); 3) the trait-based model (Bar-On, 2000); and 4) the ability model (Mayer, Caruso, & Salovey, 1997).

Methodology

Design and Purpose. This action research study used a pre/posttest emotional intelligence assessment as well as a teacher researcher created demographic and interest survey. The purpose of the research was to answer the following questions:

1. Is it possible to impact student emotional intelligence level or emotional quotient (EQ) over the course of two weeks?
2. What is the effect that Emotional Intelligence instruction has on student emotional intelligence (EI) level or emotional quotient (EQ)?

Context. Central Appalachian Kentucky along the Virginia border was the backdrop for the study. The area has a long history of employment in the primary sector (e.g. coal mining and timber products) and nearly 20% of the population works directly in those occupations. Thirty-three percent of school-age children live in poverty between the years of 2008 and 2012 (Kentucky Kids Count, 2014) and over 30% of the local population 25 or older do not have a high school diploma or its equivalent and less than 12% have a bachelor's degree or higher. Over 50% of household incomes are generated through Social Security and Supplemental Security Income. The 2015 per capita income for the geographic area was $17,242 which is just slightly higher than the individual federal poverty guideline amount of $11,770. However, this description did not pertain to all of these participants, as 27% of the

participants reported their families' incomes to be between $25,000 - $35,000 while 55% reported their families' incomes to be between $25,000 - $75,000.

Participants. The 24 high school students (18 females and 6 males) were enrolled in an elective social studies class ranged from 9th to 12th grade students. The students' ages ranged from fourteen to eighteen. Ninety-five percent of the participants were Caucasian. Seventy-seven percent of the participants lived with at least one biological parent and half of them had lived in the same house for ten years or more. Additionally nearly one-third of the participants lived in a family of 5 or more.

The data responses from the demographic and interest survey provided a better understanding of the participants. The positive ideas, as seen below, showed that these students felt education was important, they planned schooling past high school, and they used technology for social networking:

- 95% of the participants planned on pursuing post-secondary education of some sort;
- 95% stated they participated in social networking (e.g. Facebook, Twitter, Instagram, and Snapchat, etc.)
- 91% had internet access;
- 86% responded that education was important to them;
- 86% had a smart phone;
- 77% planned to attend college; and
- 76% said they had a working computer at home.

However, there were also negative ideas reported which included the following:

- 76% responded that they spent too much time using technology;
- 76% reported they did not have a part-time job;
- 73% responded that they check text messages, emails, and social networks before they do anything else;
- 50% responded that they did their best in their classes or that they had a GPA 3.0 or higher.
- 49% answered that they used technology as a defense mechanism to block negative situations;
- 45% reported missing more than eleven days of school each year;
- 41% reported they lost sleep to use technology;
- 41% reported being tardy to school six times or more; and

- 23% responded that they neglected household chores to spend more time using technology.

Because students spend so much time on and with technology and use it to block negative situations, this may suggest that the participants lack acceptable emotional intelligence skills to cope with uncomfortable social situations. Additionally, attendance and work ethic appear to be a concern.

Instrumentation. Both surveys were completed using paper and pencil. On day one, the demographic information and an interest survey where given together as one survey and most of the findings were discussed under participant's session above.

On day two, the participants were given the EQ Self-Assessment (n.d.) pretest which measures the emotional intelligence level and was used to establish a baseline emotional quotient. The EQ Self-Assessment, which was developed by Attitude Words in Australia and had no reliability or validity scores available, has 20 items that uses a 5-point Likert scale from strongly agree to strongly disagree.

The 20-item statements were modified so they were appropriate for the classroom instead of the work place and used vocabulary that the participants could understand. For example, the original assessment asked the following questions:

1. If a co-worker or supervisor gets angry with me, I react by getting angry.
2. It is important to have time to socialize with co-workers.
3. If I bump into a co-worker away from work, I am often at a loss as to what to talk about outside of work.

The researcher modified the questions as follows:

1. If a peer or teacher gets angry with me I react by getting angry.
2. It is important to have time to socialize with peers.
3. If I bump into a peer away from school, I am often at a loss as to what to talk about outside of school.

The same EQ Self-Assessment survey was given to the students for the pretest. This allowed the researcher to determine if the 5 EI Lessons below had any impact.

Intervention: EI Lessons. The intervention consisted of a series of five lessons from the Self-Science Curriculum found at www.eqtoolbox.org. The Self-Science Curriculum is part of the Six Seconds emotional intelligence system that was developed based upon the work of

Mayer, Salovey, and Caruso as well as Goleman (Sei-yv assessors manual, 2012). The 5 lessons were presented over a two week period and focused on the EI components: self-awareness, self-regulation, motivation, empathy, and social skills.

The teacher researcher chose the Self-Science lessons because of their availability. During the search for existing resources and EI instructional activities, it was found that free emotional intelligence/social emotional learning (SEL) instructional activities were limited. The following 5 lessons were presented in the following order:

*Lesson 1***.** The *Empty Your Wallet, Pockets, or Purse* (www.eqtoolbox.org) lesson focused on student's self-awareness. The online lesson plan provided the necessary directions to prepare the activity and directed the teacher researcher sequentially. All of the remaining lessons were presented from their respective online lesson plan. This lesson had students describe how their possessions describe who they are. Small groups were determined by having the participants number off 1-4, with all the "1: students in a group, all the "2" students in a group and so on. In their group, participants shared what they carried in their wallet, pockets and/or purse and why they carried these items. It was also determined by the group what these items told others about themselves. Additionally, the participants were also asked to visualize what they would have in their possession in five years as a part of goal setting.

Procedure:

1. Students were divided into groups of 4 or 5.
2. Students were asked to take personal items (i.e. cell phone, wallet) from their pockets, purse, and/or backpack to share with their group peers. Additionally, they were asked to describe each item and tell why they had it with them. (Participants were told that they did not have to share everything that they had in their possession.) Some items students chose to share were keys, lanyards, wallets, combs, brushes, cosmetics, change, money, papers, chewing gum, hard candy, pens, pencils, and nail clippers.
3. During the process of listening to other group members describe their items the participants were to complete notes on a graphic organizer.
4. Once every group member had completed their descriptions of their items, each group member was to determine what each of the other group members' habits, likes, dislikes, fears, and aspirations were based upon the items shared.
5. Once each participant had profiled the other group members they were allowed to ask clarifying question for greater details.
6. The culminating activity was for each participant to write a letter to the researcher describing what their items told the group about them. They were to also write about what they thought they would have in their wallet, purse, or backpack in a year and also five years.

7. Finally, the researcher led a whole group discussion. Some questions asked were:
    a. Did you feel exposed when you shared your personal items?
    b. Were there items that you did not feel comfortable sharing?
    c. Did you learn anything about yourself from your personal items?
    d. Did you learn anything about your group members from their personal items?
    e. What will be in your pocket/purse/backpack when you are the person you want to be?
    f. What will you have to do to accomplish this goal?

Lesson 2. The *Naming Your Feelings* (www.eqtoolbox.org) instructional activity focused on having students examine their individual and group vocabulary by describing feelings. The activity also promoted the concept that individuals can change their feelings if they are self-aware of their feelings. This lesson also involved Mayer, Caruso, and Salovey's (1997) areas of emotional thought and understanding which are paramount in self-regulation, empathy, and social skill development.

Procedure:

1. Prior to the participants entering the classroom the teacher-researcher projected on the projection screen in the front of the classroom a "feelings continuum": Angry-Upset-Sad-Calm-Indifferent-Bored-Happy-Excited.
2. The initial class discussion question presented to the participants as the session began was "How are you feeling today?" When students responded without detail (i.e. "fine") a discussion was held about why we answer that way even when there are thing bothering us.
3. Next, have the participants indicate where their feelings are on the "feelings continuum" on their paper. Have them add any word they believe better describes their present feelings.
4. Then have the participants set a goal of how they would like to be feeling in an hour and at the end of the day. The participants were asked to discuss how they could accomplish these goals.
5. The following guiding questions were asked:
    a. What did we just do? (Becoming aware of our feelings and thinking emotionally to set goals).
    b. Are feelings easy or hard to discuss? What makes them hard to talk about?
    c. How do you know when you are feeling a feeling? Can you stop or change your feelings? Can you increase your feelings?
    d. What are some lessons you have learned from today?
    e. Where else could you use what you have learned today?

6. Finally, the culminating activity was to have the participants individually list all of the feeling words they could think of and list them on their paper. Once adequate time had elapsed the feeling words were written on the board. The collection of feeling words was discussed and the participants were asked how writing the words down made them evaluate their feelings.

Lesson 3. The third lesson, *Watch Your Words* (www.eqtoolbox.org), focused on the impact the words we say have on others. It focused on "killer statements" that individuals have a tendency to say and not realize the effect that these statements have on those around them. Part of the exercise is to do a cost/benefit analysis of what we say and the establishment of ground rules in different groups and social settings. The objectives of this lesson were self-awareness and self-regulation, which correlate with Mayer et al. (1997) areas of emotional perception, understanding, and management.

Procedure:

1. Once the participants were seated and the session had begun the teacher-researcher defined what a killer word or statement was. Participants were then told, "Everybody stand up. When I say 'Go', all of you say or shout the killer statements you have held in until now. Use all of the killer gestures, sounds, and words you want. You can talk to your neighbors, the air, the whole group, your chair, or whatever feels most comfortable to you." Remind the participants that they are in a classroom and to refrain from profanity and the use of racially/ethnically derogatory statements.
2. Once the participants shared their killer words the participants were instructed to sit and discuss the following:
    a. What were your feelings as you were saying your killer statements and making your gestures? What or how did you feel after you made them?
    b. Are killer statements put-downs, or insults? Explain.
    c. How does it make you feel when someone directs a killer statement at you? How does it make you feel when you direct a killer statement at someone else?
    d. Why do you think people make killer statements? Why do you?
    e. Have the participants make a T-chart with the heading of the left column "Negative" and the right column "Positive". Have students create a list of all the words and phrases that they and others use as "put-downs" or to negatively judge them and place those words in the left column of their paper. Then have the students use the right column to list words that are positive and used to praise and respect others.
    f. Once they have completed their lists students answered the following:
        1. How long is each list?

2. Which group is more in use?
3. Is there anything good about using the negative words and phrases?
4. Which ones particularly get to you?
5. How often do you hear them in this class? In school? Out of school?
6. If no one in this class made any killer statements or put-downs for the rest of the week, what would happen? What would you personally get out of such a truce? What would you or the class lose?
7. What would happen if everyone stopped making killer statements? What would be some of the benefits of that? What are some costs to that?
8. Is it important to perceive and understand the social setting when determining the way we are expected to interact?

g. The participants were then asked to complete a reflection on what they had learned about themselves, their peers, and how they could better manage their emotions.

Lesson 4. The fourth lesson, *Trust Thermometer* (www.eqtoolbox.org) is like a rating scale – it provides a quick check for individuals and the group and then leads to a group discussion. The objective of this lesson was self-awareness and correlates with Mayer et al. (1997) areas of emotional perception and emotional understanding. The rating is based upon the individual participants perception of their level of trust they possessed based upon the question. It was not a scientific rating scale or one with a rubric; just their individual judgment. The participants were asked to consider their level of trust in different social settings. After examining their individual levels of trust, the participants were asked to reflect on what shaped their level of trust. Next, the whole group discussion focused on several areas, from how the students chose to participate in the activity to why some people are more trusting than others and to specific questions about how to increase trust in people. This activity took an abstract concept and made it visible. Trust is generally developed over time.

Procedure:

1. Instructed the participants move all of the desks, chairs, tables, etc. out of the center of the room to one of the adjacent walls giving the participants as much room to move forward as possible.
2. The participants were instructed to line-up along a wall that gave them the greatest room to move forward.
3. The participants were instructed for each statement that they heard to take zero steps for a situation they did not have trust, one step for some trust, two steps for average trust, three for a high level of trust, and four steps for complete trust. These were also written on the board so students could use for a quick reference.
4. Read the following scenarios to the participants:

a. Your best friend asks to borrow $5. Do you think you will get the money back?
b. Your best friend asks to borrow $50. Do you think you will get the money back?
c. You are at lunch in the cafeteria.
d. Your best friend wants to blindfold you and take you someplace in school. Would you go?
e. Your best friend wants to blindfold you and take you someplace in the car. Would you go?
f. A club from school wants to blindfold you and take you someplace in school. Would you go?
g. A club from school wants to blindfold you and take you in a bus. Would you go?
h. Some friend asks you who you want to ask on a date. Would you tell them?
i. Because of your skills, your teachers want you to go to a math/music/chess or similar competition. Would you go?
j. Your coach wants you to try out for another sport. Would you do it?

5. The participants were to reflect on each of the following questions:
    a. What happened for you in this activity?
    b. What were some of your thoughts, feelings, and actions?
    c. In what ways was this activity an accurate depiction of your level of trust?
    d. How were you influenced by your peers?
    e. What are the effects of competition at our school? How does competition affect trust?
    f. What is it that your best friend does, or allows you to do, that makes you so comfortable with him/her?
6. After completing the reflection on each of the questions in number five facilitated whole group discussion on their reflective responses. Participants could visualize their level of perceived trust and compare that level to their fellow participants.
7. Teaching how to assess trust:
    a. Check your body: When you think of a person or situation, what is happening with your body? Are you fidgeting, tense, in pain, etc.?
    b. Check your heart: How do you feel emotionally? Are you happy and excited?

c. Check your mind: What do you think rationally? Given what you think, is trust reasonable?
d. Check your intuition: If you had to decide this second without thinking, would you trust?
e. If you answered "yes" to all four situations then it is most likely you trust or can trust this individual or situation. If you answered "no" to any of the situations then you may need to examine the person/situation and proceed with caution.

Lesson 5. The fifth and final lesson, *Celebrate New Goals* (www.eqtoolbox.org), caused the participants to consider the characteristics of someone that they considered to be a great influence on society. The activity required the participants to consider actions, morals, behaviors, and the impacts of actions. The students examined if change is caused externally or internally. The objectives of this lesson were self-awareness, self-regulation, and empathy that correlate with Mayer et al. (1997) areas of perceiving emotions, understanding emotions, and emotions facilitating thought.

Procedure:

1. Each participant or small group was to identify a person who in their opinion is a positive role model and identify one of his/her key attributes that the participants would like to emulate.
2. In the small group the participants were asked to make a list of actions and/or behaviors that demonstrate that attribute.
3. Each participant or group was instructed to make a pledge to try out the action that they selected for at least one day. The pledge can be between the participants and the researcher or between participants. It should include the actions each person will take, the expected results (internal and external), and a date on which the parties will communicate their progress and findings.
4. The researcher encouraged the participants to check off the actions every day that they perform them. They are also allowed to add to their list of actions and even new attributes.
5. Discussion questions when we came back from the weekend were (can be any appointed time in the future) :
    a. Which comes first, internal changes or external changes?
    b. Who is responsible for each kind of change?
    c. How do you decide if you meant to change or if you were pushed to change?
    d. Does changing yourself change other people?

Data Analysis. At the end of two weeks, after the 5 lessons were completed, students repeated the EQ Self-Assessment. The pre/posttest were compared utilizing the Wilcoxon

Matched-Pair Signed-Rank test (PROPHET StatGuide, n.d.) to determine if the EI instructional component (5 lessons) may have had a statistically significant impact on student individual EQ

Results and Discussion

To answer research question 1, Is it possible to impact student EI levels or EQ over the course of two weeks, the Wilcoxon Matched Pairs *t*-test was used to determine if there was an impact from the 5 EL lessons. As seen in Table 1, there was a change in mean scores from a pretest score of 26.5 to posttest 27.3. As there is a mean difference we can show that in only 2 weeks, one's EI scores can be impacted through EL lessons.

To answer research question 2, "What is the effect that EI instruction has on student EI levels on their EQ scores", again the Wilcoxon Matched Parted *t*-test was used and reported in Table 1. There was a difference in the mean scores but the Wilcoxon ($W(19) = 83$, $p>.05$, two-tailed test) suggested that the change was not a statistically significant. Additionally, upon closer examination of these scores the results show that these five EI lessons did changed EQ scores as positively, negatively or not at all. As seen in the Table 1, 11 students EI scores increased, 8 students' scores went down, and 5 students' EQ scores stayed the same.

Table 1: EQ Self-Assessment Scores and Wilcoxon Analysis

Pair	Pre-Test	Post-Test	Difference	Absolute Difference	Rank
1	31	38	7	7	11
2	28	28	0		
3	16	10	-6	6	6.5
4	42	20	-22	22	19
5	21	21	0		
6	31	37	6	6	6.5
7	9	15	6	6	6.5
8	48	41	-7	7	11
9	36	33	-3	3	2.5
10	22	2	-20	20	17.5
11	19	31	12	12	13.5
12	28	28	0		
13	6	6	0		
14	16	10	-6	6	6.5
15	34	37	3	3	2.5
16	40	28	-12	12	13.5
17	38	54	16	16	16

18	35	55	20	20	17.5
19	14	8	-6	6	6.5
20	44	45	1	1	1
21	14	20	6	6	6.5
22	5	12	7	7	11
23	53	53	0		
24	7	20	13	13	15

Total (n = 24; Wilcoxon Matched Pairs Rank n = 19)

W = 83, z = -0.483, p (z) = 0.629

Wobt = 83 > 54 Wcrit (Two-tailed test)

Pre-test = 26.54; Post-test = 27.17

St. Dev. Pre-test = 13.98, St. Dev. Post-test = 15.66

The literature suggests that if EI matters (Goleman, 1997) and can be improved through EI instruction, then it is likely that higher emotional intelligence will lead to more positive behaviors and self-awareness (Durlak et al., 2011; Goleman, 2000; Mayer, Caruso, & Salovey, 1997). Additionally, Elias and colleagues (1997) stated that emotions can either positively or negatively affect children's intellectual development, motivation, evolution of their work ethic, and their eventual academic and work success. Therefore, it is important that schools help students develop both cognitively and emotionally (Durlak et al, 2011; Goleman, 2000).

Thus, the teacher-researcher sought to help these students build their emotional levels by including 5 EI lessons into the curriculum. The pretest showed that these 9^{th}-12^{th} grade students had very low emotional levels on the pretest, as the highest EQ score recorded was a 53 out of a possible 100. And even when the mean increased from pretest to posttest, the highest posttest score was 55 out of a possible 100, which is still low.

The results of the pre/posttest showed that 11 (46%) of the student participants' scores from pretest to posttest increased. The data also showed the 8 (33%) of the student participants' scores decreased while 5 (21%) of the student participants showed no change in their scores. The data suggests that these 5 EI lessons taught over a period of 2 week did have a positive impact on 11 students in increasing EQ scores. However, the data also showed that one-third of the participants' posttest scores decreased. This is not surprising because as students become more aware of EI and its impact on themselves and others, individuals may evaluate themself either more optimistically or more critically.

It is important to help these students build their EI (Goleman, 1997) and these lessons did make a difference and provided a visible way for these students to understand self-

awareness, self-regulation, motivation, empathy, and social skills. However, learning to apply these lessons takes time and until one has time to internalize and use the knowledge learned, it appears that students are getting worse instead of better (Goleman, 2000).

Limitations

There are several limitations that must be kept in mind as this discussion is read. First, this was an action research study and thus the findings are not necessarily comparable to other populations. Second, the study was conducted with a convenience sample and not randomization. Third, the assessment instrument lacked valid and reliable psychometrics but was deemed sufficient by the teacher-researcher for this project. Fifth, the study used self-reported data using a 5-point Likert scale. Sixth only 5 EL lessons were conducted over the course of 2 weeks. Finally, this was a small number of participants from the Appalachian Kentucky where there is a historic, generational poverty.

Conclusion and Recommendations

If this study was to be replicated, it is recommended that the study be conducted over a longer time span, as two weeks was not enough time for these students to really build a strong understanding of EI. Additionally, the participants needed more time for both applications of the lessons as well as reflection of emotional intelligence techniques in order to build better self-awareness, self-regulation, motivation, empathy, and social skills. Furthermore, it is recommended that a reliable and valid assessment instrument be used, preferably an online instrument with included data analysis. Finally, discussions need to occur with students so they do not stress when their scores go down, as this is part of the learning process.

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AN ONLINE INSTRUCTIONAL TOOL IN THE HIGH SCHOOL SPANISH FOREIGN LANGUAGE CLASSROOM: EFFECTS ON ACHIEVEMENT, ATTITUDE, AND ENGAGEMENT

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Abstract The use of technology in the Spanish foreign language classroom can provide learners rich authentic resources for learning new vocabulary terms. The purpose of the current action research study was to determine the effect of the technology assisted vocabulary instruction Wordplay on foreign language vocabulary retention, student attitudes, and student engagement in the Spanish foreign language classroom. The study involved 52 English-speaking high school students learning Spanish over an 8-week period. One class received traditional Spanish vocabulary instruction and the other received online Spanish vocabulary instruction with the website Wordplay. Achievement was measured using pretests, immediate, and 10-day delayed posttests. Findings indicated no significant difference in achievement between the groups, no significant difference between the two groups' attitudes toward knowledge and use of the Spanish language, and no significant difference in class participation levels between groups. Based on these findings, it was concluded that the use of Wordplay did not provide any advantages to students' acquisition of Spanish vocabulary.

Keywords: Foreign language, online instruction, high school, action research

Introduction

The ability to communicate in more than one language can provide individuals with increased opportunities for work, career, and travel. The high school Spanish classroom for English speakers is an important part of learning a new language and often one of the first settings where students first come to learn the language (Collins & Muñoz, 2016; Meli, 2009; Stager, 2010). However, there is a lack of national data to reflect student performance and achievement in this area. The most notable test is the Advanced Placement (AP) Spanish Language test taken by students across the United States. Results from the AP Spanish Language test ranging from years 2003 to 2013 indicate that the number of students scoring a one or two, considered an unsatisfactory score, has increased from 9.5% to13 % while and the number of students scoring a 5, a top score, has decreased from 31.9% to 24.5 % (College Board, 2016).

Teachers of foreign language, Spanish language in particular, recognize the lexical needs of foreign language learners and the importance of addressing this issue (Erbes, Folkerts, Gergis, Pederson, & Stivers, 2010; Lugo-Neris, Jackson, & Goldstein, 2010; Palapanidi, & Agustín Llach, 2014). Determining effective ways to increase students' second language (L2) vocabulary acquisition can improve teaching practices, learners' confidence with second language (L2) acquisition and student achievement in L2 communicative competency (Erbes et al., 2010; Larrotta, 2011). The use of technology in the Spanish foreign language classroom (FLC) can provide learners with rich authentic resources for learning L2 (Chen & Chung, 2012; Wang & Vásquez, 2012). The purpose of the current action research study was to determine the effect of the technology assisted vocabulary instruction Wordplay on foreign language vocabulary retention, student attitudes, and student engagement in the Spanish FLC. This study may inform decisions about the use of Wordplay as a strategy for improving vocabulary acquisition in the Spanish FLC.

Literature Review

Vocabulary Knowledge. A language is composed of various elements that interact simultaneously to facilitate communication. Some of those elements include lexical knowledge, grammatical competence, semantic and pragmatic abilities, syntactic structures, and morphological recognition (Language, 2016). Despite the many moving parts of a language, some researchers argue that vocabulary acquisition is central to second language acquisition (SLA) (Reynolds, 2015; Roseley Santos & Phalangchok, 2015). While grammatical competence is also important, if students do not know enough vocabulary to execute the grammatical skill they are mastering, their communicative abilities are diminished (Roseley Santos & Phalangchok, 2015). On the other hand, communication in the L2 is not always impeded by grammatical errors provided that the speaker is able to produce adequate vocabulary for the situation. For example, one could order a meal without conjugating verbs correctly or making errors in word order as long as adequate vocabulary is used to convey general meaning. Likewise, beginning learners of an L2 will often obtain and

decipher meaning according to the vocabulary they hear rather than attending to grammatical structures (Larrotta, 2011).

Vocabulary knowledge is central to communicative skills. Vocabulary knowledge has been linked to growth in reading comprehension (Jung, 2016; Lervåg & Aukrust, 2010; Reynolds, Wei-Hua, Hui-Wen, Shu-Yuan, & Ching-Hua, 2015). A number of researchers suggest that a strong proficiency in learner's first language (L1) facilitates vocabulary acquisition in the second language (Jung, 2016; Norman, Degani, & Peleg, 2016; Türker, 2016). Furthermore, acquiring and retaining new vocabulary is important for supporting a strong lexical base to develop fluency in the L2 (Larrotta, 2011). Vocabulary acquisition and lexical knowledge are fundamental in SLA; however, these skills may prove to be difficult for some language learners.

Receptive knowledge is the ability to recognize a structure or concept after receiving explicit instruction, while expressive or productive knowledge is the ability to utilize the structure or concept after instruction and usually after an extended period of time. Expressive knowledge hinges on a learner's ability to retain information. Studies show that lexical retention levels tend to be poor thereby negatively affecting productive knowledge and a learner's ability to communicate (Chen & Truscott, 2010). However, explicit vocabulary instruction in classroom settings, such as "direct contrasts with L1 words or dictionary use", was deemed effective in learning initial word forms (Chen & Truscott, 2010, p. 711; Peters, 2014).

Numerous instructional strategies for facilitating vocabulary acquisition and retention have been suggested. Lugo-Neris et al. (2010) and Stager (2010) found that the use of vocabulary flashcards was an effective tool for the acquisition of vocabulary for all learners. Larrotta (2011) found that the use of personal glossaries requiring learners to internalize vocabulary in a variety of ways was an effective method for vocabulary acquisition with Spanish speaking adults learning English as a second language. In their study of university students learning Spanish, Sagarra and Alba (2006) found that the keyword method facilitated the highest levels of retention, followed by rote memorization and semantic mapping. Glossing, a process of transcribing one language to another through visual word patterns, was found to increase vocabulary retention (Jung, 2016). While many of the instructional methods proved to be beneficial, it is likely that a combination of several strategies is most effective.

Online Instructional Tools. The use of technologies in the FLC can provide learners with rich authentic opportunities for learning L2 (Chen & Chung, 2012; Wang & Vásquez, 2012). Studies on the benefits of technology use to learn langauge in the FLC has produced mixed results. The wide array of available technology resources makes it difficult to compare results and make generalizations. For example, some studies indicate that the use of multimedia and hypermedia resources in the classroom do not greatly improve student

achievement or learner attitudes (Meli, 2009; Yanguas, 2012). However, in a meta-analysis of computer-assisted second langauge vocabulary instruction, Chiu (2013) found that (a) vocabulary acquisition was higher for students who used computer assisted langauge learning (CALL) for less than a month compared to students who used CALL longer than a month, (b) adolescents benefit more from CALL then younger learners, and (c) that CALL's flexibility for independent learning benefits the learner's vocabulary learning more than the aid of the teacher. However, Collins and Muñoz (2016) contradict the last finding stating that teachers serve important roles as language and technology experts facilitating the learning process.

While many studies have emerged in recent years regarding vocabulary acquisition and SLA, there are still gaps in the body of research. Current studies report on vocabulary acquisition and retention for adult and very young learners and English language learners. Few studies report on secondary level students in the Spanish FLC. In addition, there are fewer studies about Spanish as L2 than those found within the ESL context. No study has addressed the effect of learner's vocabulary acquisition on classroom engagement. Studies combining the use of technology in the high school Spanish as a foreign language class are scarce at best.

Purpose of Research

In the research site's school improvement plan, teachers were encouraged to integrate technology into instruction. Furthermore, a need to increase retention of new vocabularies taught in the Spanish FLC was pressing (Pine, 2009). A free online program for improving Spanish vocabulary, Wordplay, was chosen for implementation for its multimodal approach and for its potential to improve vocabulary knowledge and retention.

The purpose of the current study was to investigate the use of Wordplay in the Spanish FLC, and its effect on student vocabulary retention, students' attitudes toward their knowledge and use of the Spanish language, and student engagement in the Spanish FLC. The effectiveness of the online vocabulary instruction through Wordplay was determined by a comparison to direct vocabulary instruction, which included class activities and readings, textbook-based activities, and homework. The research questions are as follows:

1. Will high school Spanish students' achievement increase using online vocabulary instruction through Wordplay compared to direct vocabulary instruction?
2. Will high school Spanish students' attitudes increase using online vocabulary instruction through Wordplay compared to direct vocabulary instruction?
3. Will high school Spanish students' engagement using online vocabulary instruction through Wordplay compared to direct vocabulary instruction?

Methodology

Action research is a qualitative research approach and methodology that is participatory, practical, technical, context based and focused on addressing real pedagogical challenges and solutions to benefit teaching and learning (Denzin & Lincoln, 2000). Action research provides teacher-researchers opportunities to examine teaching and reflect on their practices. First, teacher-researchers plan to study a problem. They then identify an area of focus, determine how to collect, analyze and interpret data, and as a concluding step, they develop a plan of action (Creswell, 2012). Second, as part of research teams seeking to improve practice and learning, teacher-researchers agree on an intervention, based on best practices for researching, to implement in their classroom for an assigned time span. Thirdly, teacher-researchers make observations and collect data using instruments. Finally, teacher-researchers evaluate and reflect on data and make conclusions about their practices (Kemmis, & McTaggart, 1998 as cited in Nelson, 2013). Important here is that teacher-researchers are immersed in the context, experiencing the classroom, and configuring patterns of teaching and learning (Pine, 2009).

Hubbard and Power (1993) also suggest that teacher action research address open-ended questions, rather than questions producing yes or no responses often inherent in positivistic research designs. In this vein, the teacher-researcher in this study sought to address open-ended, context embedded questions to examine the effectiveness of a teaching tool to help her students learn new vocabulary (Shagoury & Power, 1993). As such, multiple data sources were used to draw on multiple perspectives and to capture the complexity of school learning contexts (Pine, 2009).

Action research is context based, thus generalizability to other contexts is not presumed (Denzin & Lincoln, 2000). The mixed methods approach was used in this study with data gathered through instruments and observations. Quantitative data collection specifically included an achievement measure. According to current practice in the state where the research was conducted, and in most states since the inception of No Child Left Behind, progress on goals related to school improvement and choices of teaching strategies must be based on data, with achievement as the ultimate indicator. Thus, this study used content-based pre-and posttests to measure student achievement on Spanish vocabulary as the result of interacting with Wordplay. The administration of pre-posttests is also reflective of common classroom assessment practices. In addition, for expediency purposes, a survey on students' opinions of the use of Wordplay was administered to gather students' attitudes toward learning Spanish vocabulary with this technology. As a qualitative measure, teacher-researcher observations were recorded in a student engagement checklist and field notes to gauge students' engagement with learning new vocabulary using Wordplay.

The teacher-researcher used both quantitative and qualitative approaches to provide a more balanced approach to data collection and analysis and increase confidence in study's

results (Jick, 1979). In this study, data triangulation was accomplished using student achievement data supplemented with attitudinal data and teacher-researcher field notes of student engagement. Common themes were identified from the data triangulation process (Patton, 2002).

Setting and Participants. This study was conducted in a rural secondary school located in the southeast region of the United States. At the time of the study, City High School, a pseudonym, had approximately 3,001 students, with percentage of enrollment by race and ethnicity of 68% White, 24% Black, 5% Hispanic, 2% Multiracial, and 1% Asian (State Department of Education, 2012). Thirty-eight percent of the student population was eligible for free or reduced-price meals in 2010-2011 (State Department of Education, 2012).

The research participants in this study were high school students (*N* = 52) enrolled in two Spanish II courses, having passed the prerequisite Spanish I course. Convenience sampling was used to select the participants in the direct vocabulary group (*n* = 24) in first block Spanish II and the technology assisted vocabulary instruction group (*n* = 28) in fourth block Spanish II. Participants' grade levels ranged from 10^{th} to 12^{th}, and the average age was 16.5 years. The demographics for both groups of participants are listed in Table 1.

Table 1: Demographic Data for Direct Vocabulary Instruction Class and Technology Assisted Vocabulary Instruction Class

Characteristic	**Direct Vocabulary Instruction Class** ***n* = 24**	**Technology Assisted Vocabulary Instruction Class** ***n* = 28**
Gender		
Male	11	13
Female	13	15
Race/Ethnicity		
White	17	21
Black	6	7
Multiracial	1	0

Students with Disabilities	2	3
Gifted	3	5

Participants were approximately 75% White and 25% Black. Each class had a small number (five or fewer) of students identified as having a disability or being gifted. The first block class was designated as the technology assisted vocabulary instruction class and served as the treatment group.

The teacher-researcher, who held Bachelor's and Master's degree in Spanish, was the instructor of the Spanish as a foreign language course, and had been teaching for 6 years. The teacher-researcher collaborated with critical friends (Pine, 2009) including (a) fellow teachers regarding effective ways to measure student achievement and engagement in the Spanish FLC, and in peer reviewing data collection instruments, and (b) two university professors regarding study design and data analysis. The two university professors were previous teachers and administrators of public schools and teach college courses in school contexts. The professors assisted the teacher-researcher in the research process; however, they were not involved with the execution of the study or with student participant instruction. In addition, a collaboration with the school leader, teacher-researcher, and professors was established to examine and approve the research study as consistent with school and district goals, procedures, and policy requirements (Pine, 2009). The teacher-researcher had completed a nationally approved certification related to work with vulnerable populations and conducted the research under the approval of a university Internal Review Board.

Intervention. Students in both the direct vocabulary instruction class and the technology assisted vocabulary instruction class received 90 minutes of daily instruction from the teacher-researcher over the 8-week period during which the intervention was implemented. The 8 weeks of research occurred at the beginning of the semester after the preliminary unit of study was taught. During the intervention period, both groups received instruction on the same two units of study covering the theme of travel and the themes of sports and daily routines. Each unit included vocabulary and grammar quizzes and chapter assessments. The same lessons, activities, practice times, pacing, quizzes, and assessments were used for both classes.

During the intervention period, students in the direct vocabulary instruction class used class time to create flashcards for new vocabulary. Students in the technology assisted vocabulary instruction class were registered for accounts on the online Spanish vocabulary website Wordplay and were instructed one time for 10 minutes on use of the website. They

played the online vocabulary game for at least 30 minutes on 1 lab day per week during the 8-week intervention period. However, students were encouraged to complete some of the required 30 minutes a week on their own time as part of regularly scheduled homework assignments. Participants in the direct vocabulary instruction class studied new vocabulary in the same ways as in previous units of study and in their previous Spanish I class during matching time periods.

The website Wordplay presented vocabulary in the form of digital flashcards, including visual and audio cues, and games. Vocabulary lessons on the Wordplay website were tailored by the teacher-researcher for the specific units of study. The website individualized Wordplay activities for each student. On logging in, students were prompted to review vocabulary words not yet mastered. As students continued to use the activities, the program scheduled regular reviews of vocabulary based on prior performance. Students completed activities utilizing current vocabulary and previously studied vocabulary, and they tracked progress using a meter of the percentage of mastery and retention of new vocabulary. The teacher-researcher accessed student progress and login time.

Vocabulary retention was assessed separately from grammar and overall chapter assessments through use of vocabulary pretests, immediate posttests, and delayed posttests for each of the two units studied over the 8-week research period. Pretests and posttests were the same for both groups and consisted of matching Spanish vocabulary words with their English meanings. The same vocabulary tests were administered 10 days after the two units of study and served as delayed posttests of vocabulary retention. Scores provided data for determining whether vocabulary retention was affected by method of vocabulary practice.

A survey measured students' attitudes toward their knowledge and use of the Spanish language, and an observation checklist form and field notes were used weekly by the teacher-researcher to compare levels of class engagement for both groups. All instruments are described in the data collection section.

Data Collection. The teacher-researcher collected data from two student groups to determine the effect of technology assisted vocabulary instruction through Wordplay on student vocabulary retention, attitudes, and behavior. Data collection instruments included vocabulary tests for two units of study, an attitude survey, and an instrument for recording observations of student engagement.

For each of two units of study, vocabulary pretests, immediate posttests, and delayed posttests were administered to all student participants. Two units of study were used to improve reliability of conclusions. Vocabulary Test 1 and Vocabulary Test 2 were developed

by the teacher-researcher with the help of two teacher colleagues, and instrument validity was established by peer review and peer collaboration. Reliability was established by administering the tests to two high school Spanish II classes in the semester prior to the implementation of the intervention (Creswell, 2012).

Throughout the study period, both classes completed the same tests at the same times. To determine vocabulary achievement, a vocabulary pretest was given prior to the start of instruction of each unit, a unit vocabulary test was given at the conclusion of instruction on the same day as the chapter test, and the same vocabulary test was given 10 days after the conclusion of each unit of study. The vocabulary tests consisted of 28 matching questions, and the words selected for the test were not considered to be cognates, or words that are similar in Spanish and English.

Scores for all vocabulary tests were reported as a percentage of the number of correct answers. After scores were established for each test administration (pretest, immediate posttest, and delayed posttest), data were analyzed using descriptive statistics (*M*, *SD*) and one-tailed *t*-tests to determine whether students in the technology assisted vocabulary instruction class demonstrated more positive gains and higher retention of new vocabulary than students in the direct vocabulary instruction class (Creswell, 2012).

The Attitude Toward Spanish Skills (ATSS) survey was developed by the teacher-researcher and consisted of 10 questions. The Likert-scale response options ranged from 1 (*strongly disagree*) to 5 (*strongly agree*) with 3 being *neutral*. The ATTS survey was administered to both groups before the intervention period began, and again to both classes at the conclusion of the second unit of study. Survey questions were designed to elicit student responses about confidence levels in learning and using the language, as well as attitudes toward use of supplemental technology tools. Responses were analyzed using descriptive statistics (*M*, *SD*) and a one-tailed *t*-test to determine whether or not the technology assisted vocabulary instruction class demonstrated more positive attitudes about their Spanish skills than the direct vocabulary instruction group. Validity of the instrument was established through peer review by a university professor and teacher colleagues at the research school (Creswell, 2012). Reliability of the instrument was established in a pilot study two semesters prior to the implementation of the present study.

A Participant Observation Instrument (POI) was developed by the teacher-researcher to record engagement for both classes. The POI was utilized 8 days during the intervention period, including 4 days during Unit 1 and 4 days during Unit 2. Engagement was observed and recorded on days during which activities were explicitly designed to elicit students' oral engagement. Students received one or more check marks under the day they participated orally in Spanish in class. At the end of the intervention period, students' scores were totaled and averaged to yield a mean class engagement score. Data were analyzed using descriptive statistics and a one-tailed *t*-test to determine whether or not students in the

technology assisted vocabulary instruction class demonstrated higher levels of class engagement than students in the direct vocabulary instruction class.

Results

The current study examined the effect of technology assisted vocabulary instruction on vocabulary retention, students' attitudes toward their knowledge and use of the Spanish language, and in-class student engagement in the target language L2, and results from each instrument are reported here.

Vocabulary Retention Achievement. Student vocabulary learning was measured for two units of study conducted over 8 weeks. Assessments included vocabulary pretests, immediate posttests, and 10-day delayed posttests. Results of the pretest and immediate posttest for Unit 1 for the direct vocabulary instruction group (n = 24) and the technology assisted vocabulary instruction group (n = 28) are presented in Table 2. Both the direct vocabulary group ($t(24) = -21.59$, $p < .001$) and the technology assisted group ($t(28) = -26.35$, $p < .001$) scored statistically significantly higher on the Unit 1 immediate posttest than the pretest, indicating that both participant groups made significant gains in vocabulary acquisition for Unit 1.

Table 2: Vocabulary Test 1: Comparison of Pretest and Immediate Posttest

	Pretest		**Immediate Posttest**		**Mean Increase**	**Comparison of Means**	
	M	*SD*	*M*	*SD*		*t*-value	*p*
TVI (*n* = 24)	17.50	12.34	89.25	13.44	71.75	-21.59	< .001***
TAVI (*n* = 28)	17.39	12.46	87.11	16.89	69.72	-26.35	<.001***

Note. TVI = direct vocabulary instruction group; TAVI = technology assisted vocabulary instruction group.

*$p < .05$, **$p < .01$, ***$p < .001$

The direct vocabulary group scored slightly higher on the immediate posttest (M = 89.25) than the technology assisted vocabulary group (M = 87.11), but the difference in the scores was not statistically significant ($t(52) = -.50$, p = .31). These results indicated that the

acquisition of new vocabulary was comparable for both participant groups for Unit 1. The treatment had a negligible effect (*d* = .14) on immediate vocabulary gains when compared to gains after direct instruction.

In order to measure levels of vocabulary retention, participants in the direct vocabulary instruction group and technology assisted vocabulary instruction group were administered a Vocabulary Test 1 delayed posttest. The results comparing the immediate and delayed vocabulary posttests for Unit 1 for both participant groups are presented in Table 3.

Table 3: Vocabulary Test 1: Comparison of Immediate Posttest and Delayed Posttest

	Immediate Posttest		**Delayed Posttest**		**Mean Increase/ Decrease**	**Comparison of Means**	
	M	*SD*	*M*	*SD*		*t*-value	*p*
TVI (*n = 24*)	89.25	13.44	87.33	16.99	-1.92	1.21	.12
TAVI (*n = 28*)	87.11	16.89	82.29	21.37	-4.82	2.65	.01*

Note. TVI = direct vocabulary instruction group; TAVI = technology assisted vocabulary instruction group.

*$p < .05$, **$p < .01$, ***$p < .001$

The delayed posttest scores for both groups showed a decrease from the immediate posttest scores for vocabulary in Unit 1, indicating participants were not able to retain all new vocabulary learned. The difference between the direct vocabulary group's immediate ($M = 89.25$) and delayed ($M = 87.33$) posttest scores was not found to be significant ($t(24) = 1.21$, $p = .12$). However, the difference in the immediate ($M = 87.11$) and delayed ($M = 82.29$) posttest scores for the technology assisted vocabulary group was found to be statistically significant ($t(28) = 2.65$, $p = .01$), indicating that students who learned Unit 1 vocabulary through the use of technology demonstrated a significant loss in retention after a delay of 10 days. The treatment had a small negative effect ($d = .26$) on retention after delay.

A pretest, immediate posttest, and delayed posttest for Unit 2 were also administered to both instructional groups, and a comparison of those results are in Table 4.

Table 4: Vocabulary Test 2: Comparison of Pretest and Immediate Posttest

	Pretest		**Immediate Posttest**		**Mean Increase**	**Comparison of Means**	
	M	*SD*	*M*	*SD*		*t*-value	*p*
TVI (*n = 24*)	13.29	8.48	84.96	22.31	71.67	-16.59	<.001***
TAVI (*n = 28*)	9.64	7.45	80.11	24.64	70.47	-16.65	<.001***

Note. TVI = direct vocabulary instruction group; TAVI = technology assisted vocabulary instruction group.

*p < .05, **p < .01, ***p < .001

As seen in Table 4, results were similar to those for Unit 1. For Unit 2, both participant groups scored higher on Vocabulary Test 2 immediate posttest than the pretest. The differences in the pretest and immediate posttest scores were found to be statistically significant. Both participant groups made significant gains in vocabulary acquisition for Unit 2. However, when statistically compared, the difference between the mean increases was not found to be significant ($t(52) = -.74$, $p = .23$). This finding indicated that the acquisition of new vocabulary was comparable for both participant groups for Unit 2.

A Vocabulary Test 2 delayed posttest measured levels of vocabulary retention. The results of the Unit 2 immediate and delayed posttests for both participant groups are presented in Table 5.

Table 5: Vocabulary Test 2: Comparison of Immediate Posttest and Delayed Posttest

	Immediate Posttest		**Delayed Posttest**		**Mean Increase**	**Comparison of Means**	
	M	*SD*	*M*	*SD*		*t*-value	*p*
TVI (*n = 24*)	84.96	22.31	82.88	19.78	-2.08	1.02	.16
TAVI (*n = 28*)	80.11	24.64	77.00	27.53	-3.11	1.39	.09

Note. TVI = direct vocabulary instruction class; TAVI = technology assisted vocabulary instruction class.

The delayed posttest scores for both participant groups decreased from the immediate posttest scores for Unit 2. Decreases in delayed posttest scores indicated that, similar to results in Unit 1, participants were not able to retain all new vocabulary learned; however, the differences were not statistically significant for either group. Also, while both groups demonstrated a decrease in the mean score on the delayed posttest, the difference between the delayed posttest scores of the two groups was not found to be statistically significant ($t(52) = -.87$, $p = .19$).

These results support the conclusion that both group of participants did not demonstrate a significant loss in retention for Unit 2 vocabulary, and retention levels of Unit 2 vocabulary were comparable between groups. Students who learned vocabulary through technology did not retain significantly more or less Unit 2 vocabulary than students who did not use technology.

Considering all achievement measures of vocabulary knowledge and retention, both methods of vocabulary practice resulted in significant increases in vocabulary knowledge for both units during the study. The vocabulary tests for each unit, administered after a 10-day delay, resulted in a significantly reduced retention only during Unit 1, and only for the group utilizing technology.

*Attitudes***.** Both the direct vocabulary instruction group and the technology assisted vocabulary instruction group were administered a 10-item survey prior to and after the conclusion of the intervention period to measure students' attitudes toward their language skills. Survey responses utilized a Likert-scale with the following ratings: 1 (*strongly*

disagree), 2 (*disagree*), 3 (*neutral*), 4 (*agree*), and 5 (*strongly agree*). The results of the pre- and post-intervention surveys for both groups are presented in Table 6.

Prior to the intervention period, students responded positively to the majority of the survey items. In particular, students in both groups were strongly positive about survey item eight, indicating they would be more comfortable participating in class with a better understanding of vocabulary. As seen in Table 6, with only one exception, students responded more favorably on all survey questions at the conclusion of the intervention period. The exception was a slight decrease (- 0.03) in the mean response for technology-assisted students on the importance of learning Spanish as a second language. Significantly more positive responses were given by both groups for enjoyment of learning Spanish (item 1), general ease of learning Spanish (item 3), and confidence about Spanish skills in the classroom (item 4).

On items 5, 9, and 10, the direct group means were significantly more positive after the intervention period, but the technology assisted group means were not. Those items related to the importance of learning Spanish grammar (item 5), the use of online tools to improve Spanish skills (item 9), and the need to require use of online resources in vocabulary work (item 10). For items 9 and 10, one possible explanation is that students who did not use Wordplay may have experienced an initial interest, perhaps because they had no access to the program while those students using the online resource considered it to be a regular part of the work with vocabulary learning.

Table 6: Comparison of Direct and Technology Assisted Vocabulary Group Survey Responses

	Pre-intervention Survey		**Post-intervention Survey**			
Survey Item	*M*	*SD*	*M*	*SD*	Gain	*p*
1. I enjoy learning Spanish.						
Direct	3.33	.87	3.63	1.06	.30	<.01**
Technology Assisted	3.39	.99	3.71	.85	.32	.03*
2. I think it is important to learn Spanish as a second language.						
Direct	3.46	.93	3.63	.88	.17	.16
Technology Assisted	3.64	.68	3.61	.83	-.03	.31

3. In general, I find it easy to learn Spanish.						
Direct	3.00	.88	3.71	.81	.71	<.00***
Technology Assisted	3.07	1.18	3.50	1.00	.43	<.00**
4. In general, I feel confident about my Spanish skills in the classroom.						
Direct	3.13	.80	3.63	.71	.50	<.01**
Technology Assisted	3.11	1.10	3.57	.92	.46	<.01**
5. I think learning Spanish grammar is very important.						
Direct	3.42	.72	3.75	.94	.33	.04*
Technology Assisted	3.79	.99	3.82	.90	.03	.41
6. I think learning Spanish vocabulary is very important.						
Direct	3.83	.76	4.08	.65	.25	.09
Technology Assisted	4.04	.64	4.14	.84	.10	.24
7. I don't mind making grammatical mistakes while speaking/participating in Spanish class.						
Direct	3.04	1.08	3.25	1.15	.21	.24
Technology Assisted	3.36	1.06	3.75	.70	.39	.03*
8. I feel more comfortable participating in class when I have a good grasp on the vocabulary in the unit.						
Direct	4.25	.90	4.29	.91	.04	.41
Technology Assisted	4.18	.86	4.25	.65	.07	.32
9. Using online activities is a good way to improve my Spanish skills.	3.67	.96	4.04	1.20	.37	.02*

Direct	3.68	.86	3.89	.83	.21	.13
Technology Assisted						
10. The use of outside resources, such as online activities, should be a required assignment in a foreign language class.						
Direct	2.92	1.21	3.42	1.35	.50	<.00***
Technology Assisted	3.39	1.03	3.54	.88	.15	.16

*$p < .05$, **$p < .01$, ***$p < .001$*

Both participant groups showed significantly more positive responses on survey items 1, 3, and 4. To determine whether there were significant differences in post-intervention response levels on those items, post-intervention responses were analyzed using descriptive statistics (*M*, *SD*) and a one-tailed *t*-test. Results from these analyses are presented in Table 7. None of these post-intervention response differences were found to be statistically significant between participant groups, supporting the conclusion that the attitudes of students who learned vocabulary by using technology were not significantly different from those of students who did not use technology.

Table 7: Comparison of Participant Groups' Post-Intervention Survey Responses

	TVI (*n = 24*)		**TAVI (*n = 28*)**		**Comparison of Means**	
Survey item	*M*	*SD*	*M*	*SD*	*t*-value	*p*
1. I enjoy learning Spanish	3.63	1.06	3.71	.85	.34	.37
3. In general, I find it easy to learn Spanish	3.71	.81	3.50	1.00	-.82	.21
4. In general, I feel confident about my Spanish skills in the classroom.	3.63	.71	3.57	.92	-.23	.41

Note. TVI = direct vocabulary instruction group; TAVI = technology assisted vocabulary instruction group.

*Engagement***.** Throughout the 8-week intervention period, the teacher-researcher recorded student class engagement eight times: 4 days during Unit 1 and 4 days during Unit 2. Though no baseline had been established prior to the intervention, comparison of class engagement during the intervention could be determined by comparing changes in student engagement levels. Each time a student participated orally in the target language in class, they received a check mark. The two participant groups' scores were analyzed using descriptive statistics (*M*, *SD*) and a one-tailed *t*-test. Table 8 presents the results of these analyses.

Table 8: Comparison of Participant Groups' Engagement Scores

	Mean Engagement	***SD***	**Comparison of Means**	
			t-value	*p*
TVI (*n = 24*)	5.96	5.20	.37	.36
TAVI (*n = 28*)	6.50	5.21		

Note. TVI = direct vocabulary instruction group; TAVI = technology assisted vocabulary instruction group.

As seen in Table 8, the mean engagement score for the direct vocabulary group (*M* = 5.96) was slightly lower than the mean engagement score of the technology assisted vocabulary group (*M* = 6.50), but was not found to be significantly lower. Students who learned vocabulary by using Wordplay did not have higher or lower levels of engagement than students who did not use Wordplay. Lastly, field notes indicate that students were interested in using technology as a novel way to learn vocabulary and as a strategy that reflects contemporary digital learning experiences.

Discussion

To address the first research question on whether the use of online vocabulary instruction through Wordplay would improve students' acquisition and retention of new vocabulary, the teacher-researcher administered and analyzed assessments from two units of study. Over the two units, students in the two groups did not have statistically different gains based on comparison of pretests and immediate posttests. On delayed posttests (10 days after the end of each unit), the technology assisted vocabulary instruction group scored significantly lower on the delayed Unit 1posttest, but no significant difference was found in delayed posttests for Unit 2. Results support a conclusion that both groups had similar levels of retention on immediate tests, and that Wordplay did not have a significant effect on vocabulary retention for the technology assisted vocabulary group. The significantly greater loss of retention for the technology assisted group on Unit 1 but not on Unit 2 provided inconclusive evidence of any difference in long-term retention of second language vocabulary words.

Both participant groups made significant gains between the pre- and immediate posttests for both units, supporting the conclusion that both instructional methods were effective for students who had no previous contact with the new vocabulary. This finding also supports a conclusion that the online vocabulary instruction intervention did not increase students' levels of vocabulary retention on immediate posttests. Findings from this study were

consistent with previous literature (Meli, 2009; Yanguas, 2012) and suggest that technology does not increase student vocabulary achievement in foreign language class.

To determine whether students using the technology assisted vocabulary instruction Wordplay experienced more positive attitudes toward their knowledge and use of the Spanish language, evidence from survey results was considered. After the intervention, both participant groups' responses were significantly more favorable on three survey items. When comparing the survey responses between participant groups, however, the results indicated that there was no significant difference in the groups' attitudes on those survey items. These findings support the conclusion that, while both groups were more favorable to language learning, the online vocabulary instruction intervention did not have a significant positive effect on students' attitudes.

To determine whether student engagement levels were greater when technology was used in Spanish vocabulary instruction, observation instrument results were analyzed. The difference between the two groups' engagement scores was not found to be statistically significant, indicating that both groups participated at similar rates. Students' use of the online vocabulary instruction Wordplay did not result in significantly higher engagement levels.

Current literature does not report on the effect of technology on classroom engagement. This study's findings regarding classroom engagement were similar to the results regarding achievement and student attitudes. In conclusion, the use of technology does not appear to generate more positive effects on classroom engagement and Spanish language learning during this study period.

Educators understand the importance of vocabulary acquisition and retention in a second language (L2). Finding strategies for improving lexical retention would benefit overall student achievement in all areas of communicative competence (Larrotta, 2011). This study's findings indicate that the use of Wordplay did not significantly increase student vocabulary retention levels. Furthermore, Wordplay did not have a significant effect on student engagement in the target language L2. While the use of an online instructional tool may have appealed to students' contemporary way of learning digitally, it did not improve student learning within the study time period.

Implications and Conclusion

Findings of this study are consistent with previous research reporting that the use of technology does not necessarily provide significant advantages to students (Meli, 2009; Yanguas, 2011). More specifically, the use of the online vocabulary website Wordplay did

not significantly improve student achievement, student engagement, or student attitudes. The teacher-researcher will continue to seek effective technology for classroom use. In addition, findings of this study will be shared with other teachers at the research school with the aim of finding and utilizing other technological tools that may provide advantages to students in the area of vocabulary acquisition and retention.

It is also possible that online programs such as Wordplay can be used as a resource to provide variety and differentiation in instruction. This study was important for foreign language education in general as it addressed a gap in the literature regarding high-school students and technology in the classroom. Future studies of online vocabulary learning programs might be more generalizable if a larger and more diverse pool of participants were used. In addition, the participant groups in the current study did not have large numbers of students with disabilities. Further research might be focused on identifying an extensive set of online resources that are useful for enhancing various aspects of Spanish (or other) language instruction, and identifying what aspects the resources most appropriately address. Teachers can then have a research-based set of effective online resources that can be tailored for use to support the specific needs of their current students. An interesting avenue for future research would be examining the use of technology as a supplemental language tool for students with disabilities and for gifted students to determine whether certain student groups benefit more from specific types of language instruction.

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DIFFERENTIATING INSTRUCTION TO INCREASE CONCEPTUAL UNDERSTANDING AND ENGAGEMENT IN MATHEMATICS

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Abstract This action-research project aimed to explore several strategies that teachers can use to develop conceptual mathematical understanding and increase behavioral engagement for students with differing instructional needs. Specifically, I investigated strategies for differentiating instruction, including individualized instruction in flexible groups and the use of problems with multiple entry points over a five-month period in a 6th grade classroom. Analyses focused on six focal students, all of whom were English learners or former English learners. Overall, findings suggest that the use of flexible instructional groups and math problems with multiple entry points can help teachers meet the varied needs of students, thus allowing all students to be more engaged and successful in the classroom.

Keywords: differentiated instruction, English learners, flexible small groups, mathematics, conceptual understanding, student engagement

Introduction

I cringe as I remember my very first day as a classroom teacher. It was a refreshing August morning as I eagerly delivered my 6th grade math lesson. I had meticulously created a PowerPoint presentation on place value, complete with colorful fonts and engaging animations. I delivered my carefully crafted lesson with stereotypical first-year-teacher enthusiasm and handed out a worksheet for independent practice. My students, with their own first-day-of-school motivation, diligently began completing the problems. Gradually, students began to raise their hands with questions. I raced through the rows of students, literally jogging from desk to desk trying to lend support and answer questions. Some students looked at me with embarrassment, not having been able to start the first problem on their own. Others reached a moment of panic as soon as they saw a word problem. While I struggled to offer enough support to the students who needed it, several other

students raced through the problems and looked at me with eager eyes, asking, “What do we do next?!” I realized I didn’t have an answer for them. For some students, the problems were not challenging enough to extend their thinking, yet others had barely started. I wondered, how could I be an effective teacher to both of these sets of learners? This is the question I endeavored to answer for myself, and for other teachers who face similar challenges.

Teachers often struggle with how to differentiate instruction in order to simultaneously meet the needs of all students in their class. However, whether or not to group students according to their current mathematics achievement has been a contentious issue in education since the 1980s (Boaler, 2013). In California, the average size of a public upper elementary school classroom is over 25 students, and about one third of these are still in the process of learning the language of instruction (CalEdFacts, 2014). It is inevitable that a single classroom will represent a wide variety of student ability levels, learning styles, strengths, and needs. Teachers, therefore, must be well equipped with strategies that allow them to maximize the academic and intellectual growth of all types of learners, including meeting the needs of English learners (ELs) and former ELs. We use the term English learners (Els) here because we believe this term is familiar to our readers. However, our beliefs are more in line with term *emerging bilingual* instead of English learner as a way of emphasizing the value of bilingualism (Garcia, 2009). In our own classrooms, my co-author and I have noticed students often show signs of disengagement when instruction does not match their current level of understanding, be it too easy or too difficult. When it comes to mathematics instruction, one size does not fit all. Receiving individualized support and guidance catered to their specific needs and strengths can allow all students to thrive academically in the classroom.

This action-research study aimed to uncover how two different strategies for differentiation can be used in a 6^{th} grade classroom with the goal of increasing mathematical understanding and behavioral engagement. Although orchestrating several student groups at the same time can be challenging, we found it to be an effective way for one new teacher to meet the disparate needs of students, allowing us to use strategies suggested by past research to support ELs in particular. The following overarching questions guided our inquiry:

1. How can flexible, small group instruction impact the conceptual understanding and behavioral engagement of students with differing needs?
2. How can problems with multiple entry points (Low-Floor-High-Ceiling problems) serve as a way to differentiate instruction for students with differing needs?

Teacher-Researcher Positionality. The first author was the classroom teacher. At the time of data collection, I was in my first year of teaching. This project was conducted as part of my Masters of Education degree at a large, research-oriented university. I later extended the analyses of my project for publication. Unless otherwise noted, use of the pronoun "I" throughout the text refers to me, and "we" refers to both authors.

The second author is a former bilingual teacher and was the instructor of the two-quarter research methods course I attended as part of my Master's program. As course instructor, she guided the design of this inquiry project, encouraged me to share what I learned with other educators, and collaborated with me in writing this article.

Flexible Ability Grouping. Ability level grouping remains a controversial topic in education, and research on its impact remains mixed. While some research has demonstrated positive effects, other research suggests ability grouping can have a negative social impact on students (Hallam, Ireson, Mortimore, & Davies, 2000). In contrast, seminal work by Slavin (1987) demonstrates that ability level grouping can be an effective instructional strategy, as long as the ability groups are confined to a specific subject (e.g. math or reading). Slavin further suggests that ability grouping allows higher achieving students to be exposed to an appropriately accelerated pace of instruction, while allowing lower achieving students to receive more attention and practice.

Similarly, Gibbons (1991) discusses the notion of skills grouping: the arrangement of students into groups based on their ability levels and needs. Skills grouping, when done fluidly and for a short period of time, allows students to be exposed to instruction and content that match their current needs and level of understanding. Small-group instruction is defined as situations in which three or more students work on a common mathematical task (Jansen, 2012).

Conceptual Understanding. For the purposes of this paper, I define conceptual understanding as a student's ability to "[recognize] and [understand] core underlying [mathematical] ideas" (Burns et al., 2015) and to recognize how such ideas are interrelated (National Research Council, 2001). This stands in contrast to procedural skill, which is a student's ability to execute the steps needed to solve a problem (Rittle-Johnson, Siegler, & Alibali, 2001). I also explored how a student's ability to apply mathematical concepts to real-world situations is connected to conceptual understanding. Students with conceptual understanding are better able to apply mathematical knowledge learned at school to situations in everyday life than students who only have procedural skills (Kilpatrick, Swafford, & Findell, 2001). Further, the Common Core State Standards state that

"mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace," thus emphasizing the importance of conceptual understanding (CCSS. Math. Practice.MP4, 2017).

Behavioral Engagement. I also sought to explore how small-group instruction might impact the behavioral engagement of students. Behavioral engagement is defined as students' active participation in learning activities (Wang, Berlin, & Berlin, 2014). Asking questions, sharing answers, and making related comments all may be indicators of behavioral engagement. Student engagement is essential, as it has been shown by research to be an indicator of academic achievement (Dotterer & Lowe, 2011).

Literature Review

Small-group Instruction in Mathematics. Past research has demonstrated that small-group instruction can be used to enhance student learning. For example, Kazemi and Stipek (2001) describe how small-group discussion in which teachers press students for justification of their mathematical ideas can help students move beyond their current level of understanding. Building on this research, Webb and colleagues (2009) compared the nature of elementary math teachers' interactions with students in small groups with their interactions during whole-class instruction. Results suggest that teacher probing of students' ideas in small groups may be more effective than probing during whole-class instruction, leading to higher instances of correct and complete mathematical explanations. Given this, small-group instruction served as the foundation for my data collection.

Strategies for Supporting English Learners and Former English Learners. Research has demonstrated that some strategies are more effective than others at supporting ELs. Specifically, Walqui (2006) identified the following relevant strategies: modeling, bridging (connecting new concepts to prior knowledge), and contextualizing (relating concepts to everyday situations and language). These strategies can be applied to further support ELs during instruction in flexible ability groups. In addition to supporting students currently classified as ELs, research suggests many students who have been reclassified English proficient (former ELs) still require language support in order to succeed with the demands of content area literacy (Haas, Huang, & Tran, 2014).

Offering Choice as Differentiated Instruction. Similarly, research has also revealed strategies for enhancing both behavioral engagement and conceptual understanding in students who are "advanced," or ahead of the majority of the class. Tomlinson (2005) argues teachers should accelerate the pace of instruction for more advanced learners and offer opportunities to make choices. When students are allowed to make decisions about the materials they use, the problems they solve, or the assignments they complete, they

generally make choices that are more appropriate for their needs than what can be offered to the class as a whole; this, in turn, improves motivation and helps prevent disruptive behavior (Bluestein, 2008).

Math problems with Multiple Entry Points. Several math educators have advocated for Low-Floor-High-Ceiling (LFHC) tasks, also called Low-Threshold-High-Ceiling tasks, as a way of providing meaningful activities to different types of learners. LFHC tasks can be accessible to all students because they have multiple entry points; students can begin the problem at different levels. However, these problems also can be extended to higher levels depending on students' ability levels. The following problem is an example of a LFHC task, adapted from YouCubed (2016):

For each part of the problem, start with a square sheet of paper and make folds to construct a new shape. Then, explain how you know the shape you constructed has the specified area.

1. Construct a square with exactly ¼ the area of the original square. Explain how you know that this new square has ¼ of the area.
2. Construct a triangle with exactly ¼ the area of the original square. Explain how you know that this new triangle has ¼ of the area.
3. Construct a square (i.e. not a rectangle) with exactly ½ the area of the original square. Explain how you know that this new square has ½ of the area.

Such tasks allow students to work at their own pace, while also providing opportunities for challenge and critical thinking (Bernander & Metke, n.d.). LFHC tasks are designed to allow students to "show what they can do, not what they can't" (NRICH, 2011). Thus, these problems offer the potential for differentiating instruction while allowing all students to access grade-level concepts.

Methodology

Context and Participants. All research was conducted while the first author was the teacher of record in a self-contained 6th grade classroom. Of 28 students, 17 were ELs, and six had been reclassified fluent English proficient (R-FEP). All ELs were native Spanish speakers. School-wide, 77.5% of students qualified for Free-and-Reduced Lunch, an indicator of low socio-economic background. All classroom instruction and student discussions took place in English. Based on the previous year's standardized math scores, 71% of the class classified as "Standard Not Met," 29% as "Standard Nearly Met," and no students were classified as "Standard Met."

Table 1 displays background characteristics of the six focal students. Compared to their peers, students assigned to Intervention Group 1 were the most in need of support in regards to division and related word problems. In contrast, students in Intervention Group 2 had demonstrated an ability to work at a faster rate of instruction than the majority of their peers and had proven that they could successfully perform relevant skills independently.

Students were grouped fluidly based on their ability level of related concepts. When forming groups, I largely relied on student data collected during the lesson. For example, students answered questions on white boards during the lessons, participated in pair-shares and class discussions, and were encouraged to ask questions. Listening and recording students' responses offered data sources that helped me track how well certain students comprehended the concept at hand. Additionally, my own knowledge of student strengths and needs further helped me formulate groups.

Because of the fluid nature of the grouping process, the composition and size of the small groups were different for each lesson. For the purposes of this study, however, the six focal students remained in the same groups throughout all six rounds of data collection. It is important to note that small grouping is a strategy that I used frequently in my classroom across subjects, not just during data collection. As a result, the six focal students were assigned to different groups during other lessons. While some research has argued that ability level grouping can negatively impact students socially, I found that many students in my class *wanted* to be in the small group that received intervention instruction, and thus, more teacher attention. It should be noted that standardized test scores are included in Table 1 as a source of background information, not as a means of how students were assigned to groups.

Table 1: Focal Student Background Characteristics

Focal Students (*Names have been changed)	**Group**	**Common Core Standardized Math Assessment**	**California English Language Development Test (CELDT)**
Alex*	Intervention 1	Standard Not Met	Early Advanced (4)
Brandon	Intervention 1	Standard Not Met	R-FEP
Diana	Intervention 1	Standard Not Met	Intermediate (3)
David	Intervention 2	Standard Nearly Met	R-FEP
Megan	Intervention 2	Standard Nearly Met	R-FEP
Sammy	Intervention 2	Standard Nearly Met	R-FEP

The math content emphasized in interventions was guided by the district-adopted curriculum, GoMath! (Houghton Mifflin Harcourt).

Data Collection and Analysis. I position this study as "teacher action research" drawing on Cochran-Smith's and Lytle's (1993) definition, "systematic and intentional inquiry carried out by teachers" in their own classrooms for the purpose of taking action that has the potential to improve learning (p. 3). In this study, I analyzed the performance and growth of six focal students, conducting research in two phases. See Table 2 for a description of data collection across phases. Phase one consisted of four rounds of data collection focusing on the use of small-group differentiated instruction to meet the unique needs of each group. Phase two consisted of two rounds of data collection exploring the use of small-group LFHC tasks as another strategy for differentiating instruction. The basic format of instruction was the same for all rounds. Before I facilitated small-group instruction, I conducted a whole-group lesson in which I modeled a mathematical concept and corresponding skills. I subsequently divided students into small groups of 5-7 students based on current ability levels for the specific math concept. Behavioral engagement data was collected during both whole-group and small-group instruction.

Table 2: Summary of Data Collection

	Phase One				Phase Two	
	Round 1	**Round 2**	**Round 3**	**Round 4**	**Round 5**	**Round 6**
Conceptual Understanding Data	Pre-Interview, Quiz 1	Quiz 2	Quiz 3	Post-Interviews, Quiz 4	Pre-Interviews, Written free-response question, Quiz 5	Written free-response question, Quiz 6
Behavioral Engagement Data			Observ-ational field notes, Videotaped small-group instruction	Observ-ational field notes, Videotaped small-group instruction	Observ-ational field notes, Videotaped small-group instruction	Observ-ational field notes, Videotaped small-group instruction

Phase One: Differentiated Small-Group Instruction

Intervention Group 1. Because this group consisted of ELs and former ELs who struggled to understand word problems, I worked directly with the group using the strategy of contextualizing (Walqui, 2006). I led students in discussing and visually representing problems that required students to apply the mathematical concept taught during whole-group instruction.

For example, the focus of the lessons and activities in Round 4 was Order of Operations. During small-group instruction, students were asked to solve the following problem, (½ + ¾) ÷ 2. Students and I collaboratively contextualized this problem by creating a 'real-world' scenario that described the problem and created a picture to represent the scenario. The students contextualized the fractions saying they represented "½ of a chocolate cake and ¾ of a cheesecake." They then created pictures to represent each mathematical operation.

Intervention Group 2. This group received an adapted assignment that required them to apply the same mathematical concept, but with larger numbers and multiple steps. I also encouraged students to show multiple ways of solving each problem to offer a greater challenge and opportunities for students to make connections between solution strategies

(National Research Council, 2001; Tomlinson, 2005). Students were allowed to choose how they visually represented each problem (Tomlinson, 2005). Students largely worked independently, however, when necessary, I provided students with 'hints' and guidance in which I referenced notes and anchor charts and emphasized keywords to help students understand the situation described in word problems as they worked.

Phase Two: Low-Floor-High-Ceiling Tasks

My second phase of data collection explored the use of two LFHC tasks with students working in flexible ability level groups for two rounds of data collection. All groups worked on the same LFHC task, however, as was the case in Phase One, I focused my data collection and analysis on the six focal students in Intervention Groups 1 and 2. I designed the LFHC tasks based on activities and information published by Cambridge University's NRICH (2011) and Stanford University's You-Cubed (2016). Both LFHC tasks were designed with the intention of being accessible to all students, yet open-ended enough that students could explore them at more advanced levels if appropriate (Cohen, 1999). Students were encouraged to focus on the exploration aspect of the tasks and to consider multiple solutions and approaches to the tasks.

Measurement of Conceptual Understanding. Students completed a three-question quiz at the end of each round of data in Phase One and Phase Two. Each quiz included three types of questions (a symbolic representation, a pictorial representation, and a word problem) because an ability to apply the same concept to different representations is an indicator of conceptual understanding (Panasuk, 2010). I scored each quiz using a modified version of the publicly available rubric for extended mathematical response items created by the Smarter Balanced Assessment Consortium (see Appendix A). I chose to use this rubric because it is used to measure students' mathematical understanding on the standardized assessments aligned with the Common Core Standards.

I conducted student interviews for each phase of the project. Pre-Interviews served as baseline data for conceptual understanding. Interviews were semi-structured and meant to assess students' conceptual understanding. Phase One interviews focused on division, as division was a recurring concept that students dealt with over the entire course of Phase One. Specifically, the interview questions were meant to assess whether or not students were able to identify a connection between the concept of division and other mathematical concepts and skills. For example, one question asked, "When you are dividing, what skills do you use to help you?" Another question asked, "When you think about division, what other concepts in math might division be related or connected to?" I audiotaped, transcribed, and then coded the interviews based on four coding categories created through a deductive process (see Appendix B).

During Phase Two, I collected pre-interview data on students' ability to apply a given mathematical concept to real-world situations, another indicator of conceptual understanding (Kilpatrick et al., 2001). Again, interview questions emphasized conceptual understanding, with questions such as, "In your own words, what is area?" and "When might we use area in our everyday lives?" Similar to the Phase One interviews, I audiotaped and transcribed the interviews, and then subsequently coded them based on three categories.

In Phase Two, I also asked students to create and solve their own "real-world word problem" via a written response question at the end of each round. I coded student responses using the same coding categories created deductively for the Phase Two Pre-Interview data (see Appendix C).

Measurement of Behavioral Engagement. I captured features of students' behavioral engagement by tallying the instances in which the six focal students showed one of the following indicators of behavioral engagement during whole-class instruction: answering a question (voluntary or involuntary), asking a math related question, or sharing a math related comment/answer. I then analyzed the video recordings of small-group instruction for Intervention Groups 1 and 2, counting the number of times each of the six focal students showed one of the aforementioned indicators of behavioral engagement.

I used the behavioral engagement data collected during whole-group instruction as baseline data. I used this data to then project the number of behavioral engagement indicators that students would demonstrate during small-group instruction for each round. To create the projections, I first determined how many times more students the whole-class instruction had as compared to each small group. I then multiplied this number by the number of behavioral indicators shown during whole-class instruction for each focal student to create a projection. Finally, I compared my projected data for each focal student to the data I gathered during small-group instruction.

Results and Discussion

Developing Connections Between Concepts. The culmination of data suggests students' conceptual understanding and behavioral engagement increased over the course of the study. During the Phase One pre-interviews, only three students identified a connection between division and another mathematical concept or skill (see Appendix B). These data suggest students were still developing an ability to identify how division is interrelated to other math concepts (National Research Council, 2001).

Post-interview data suggest all six focal students deepened their conceptual understanding of division in each of the four coding categories. In fact, all six focal students were able to identify that multiplication is a necessary skill for performing division. For example, Alex stated, “To divide you need to practice your multiplication.”

Additionally, two students recognized that multiplication is the inverse operation of division, while four students articulated that multiplication is related to division. In Sammy’s words, “Because like it’s like [multiplication and division] are basically the opposite of each other.” While no students were able to identify that division can involve other mathematical operations in the pre-interview, three students were able to do so in the post-interview.

Based on these data, it appears that students in both Intervention Groups 1 and 2 deepened their conceptual understanding of division in Phase One. While it is difficult to draw comparative conclusions about students in Groups 1 and 2 due to the small sample size, the data suggest students in Intervention Group 2 had a somewhat stronger conceptual understanding of division than students in Intervention Group 1. Even so, post-interview data encouragingly suggest students were increasingly identifying connections across mathematical concepts and, thus, had expanded their conceptual mathematical understanding (National Research Council, 2001).

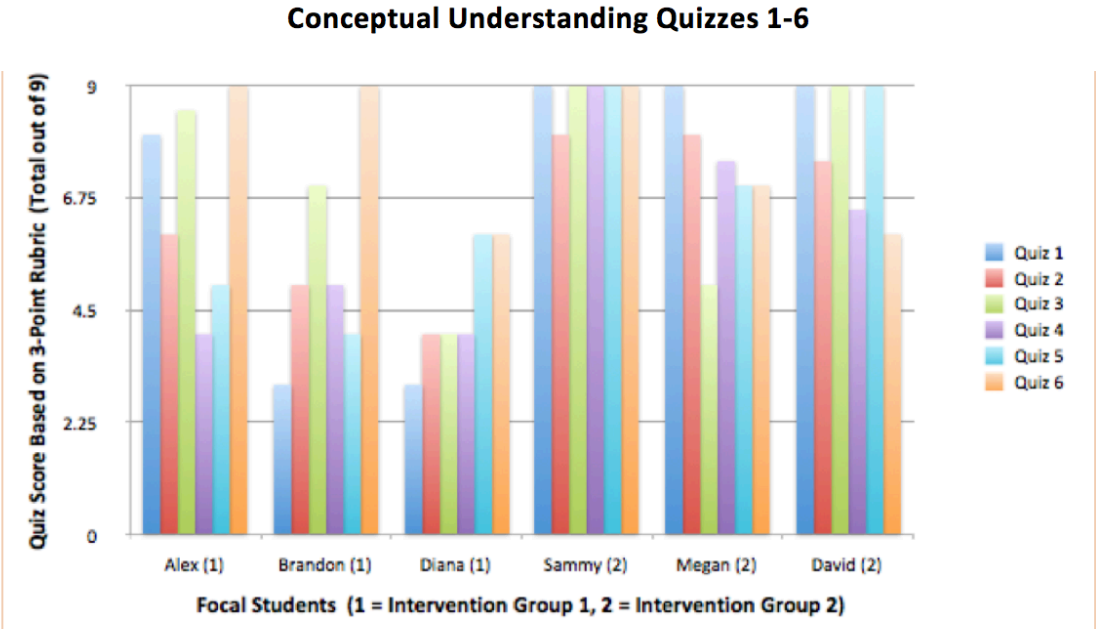
Connecting Concepts to Real-world Applications. In Phase Two, I assessed conceptual understanding based on students’ ability to apply mathematical concepts to real-world situations (Kilpatrick et al., 2001). Pre-interview data suggested students were not fully able to apply a given mathematical concept, in this case area, to a real-world situation (see Appendix C). When asked to describe a situation in which area would be used during pre-interviews, only one student was able to describe a specific situation, and only three students were able to identify and describe the relevant mathematical operation needed to solve an area problem. For example, Sammy described, “Like isn’t it base and height? And they’re kind of like put together and you know…you multiply them to be able to find the area.”

After engaging in LFHC tasks, students were asked to write and solve their own “real-world word problem” about area or volume. Data across the two rounds with different LFHC tasks revealed that more students were able to apply mathematical concepts when completing the written response questions than they were during the pre-interview. All six students were able to describe a specific real-world example involving the given mathematical concept (area) in Round 5, and four students were able to do so in Round 6, which focused on the concept of volume. The two students who were not able to create a real-world example of volume in Round 6 instead wrote a word problem about area, suggesting that these students need more opportunities to explore the differences and connections between area and volume.

Overall, data suggest students did develop a greater ability to apply mathematical concepts to real-world situations after engaging in LFHC tasks. For example, one student stated: "I have a tissue box and I want to see how much tissues fit into it. What is the volume if the height is 8 in, the width is 6in, and the length is 10 in?" Students were more frequently able to describe specific situations involving a given math concept in Rounds 5 and 6 than they were during the pre-interview. This indicates the LFHC may have helped students deepen their conceptual understanding.

Applying Concepts to Different Types of Questions. Quiz data revealed several interesting trends. In comparing average scores for each type of question across quizzes, we found no meaningful differences; the type of question that students struggled with most on each of the six quizzes varied by round. While students did not demonstrate complete conceptual understanding of the concepts that were assessed by each quiz, the fact that they were able to at least partially answer three different representations of the same concept suggests students were, indeed, beginning to develop conceptual understanding (Panasuk, 2010).

Figure 1. Graph of quiz scores for focal students. This graph illustrates that students were able to apply mathematical concepts to different types of questions.



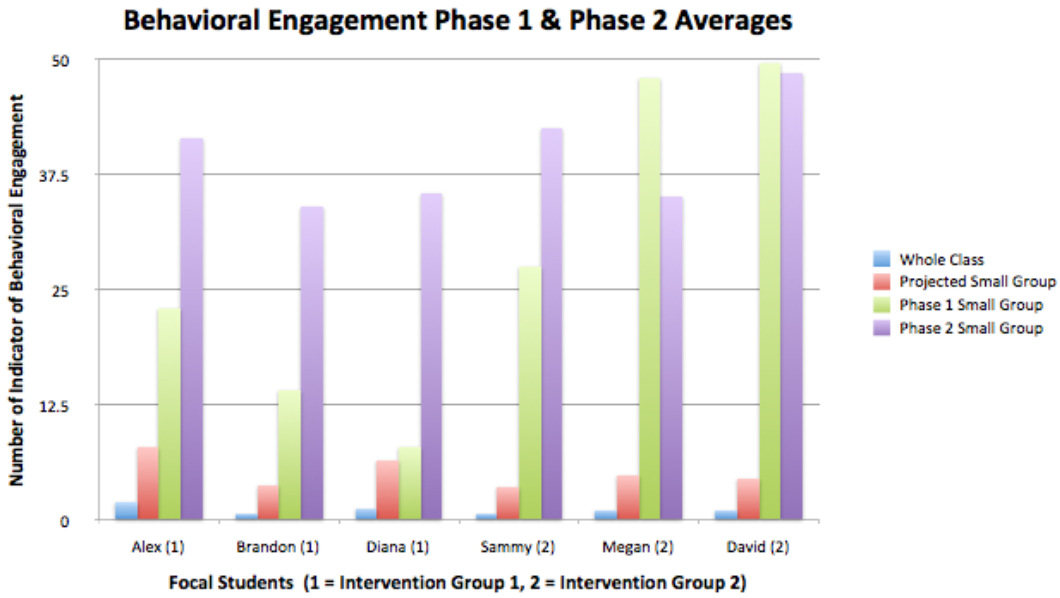
The overall quiz scores for each focal student (see Figure 1) show varied results. The results for Sammy (Intervention Group 2) show signs of the ceiling effect; despite the fact that

instruction and quizzes become progressively more challenging over the course of the data collection, the quizzes were likely not challenging enough for Sammy. Even so, the combination of Sammy's quiz scores, interview data, and written responses reveal that Sammy had likely developed conceptual mathematical understanding. This appears to also be at least partially true for the other two students in Intervention Group 2, Megan and David; while Megan and David's scores fluctuated over the course of the four rounds, they ultimately demonstrated signs of conceptual understanding based on interview, written-response, and quiz data.

Students in Intervention 1 also showed signs of improvement in regards to conceptual understanding. All three students in Intervention Group 1 showed upward-trending quiz scores over the course of the six rounds. This was especially true for Brandon and Diana. Based solely on quiz data, it appears that students had not yet fully developed conceptual mathematical understanding. Considering interview and written-response data in conjunction with quiz scores, however, suggests that students were certainly in the process of developing conceptual understanding. Each student in Intervention Group 1 was able to recognize at least one connection between division and another mathematical concept, and each was able to identify at least one specific real-world example of a concept. In short, my quiz, interview, and written-response data suggest that small-group differentiated instruction and LFHC tasks do appear to help students develop conceptual understanding (Jansen, 2012).

Behavioral Engagement. Students in both Intervention Groups 1 and 2 clearly showed an increase in behavioral engagement during small-group instruction as compared to whole-group instruction (see Figure 2). This was true in both Phase One and Phase Two. I found no meaningful differences between the baseline data for Intervention Groups 1 and 2; the focal students in both groups showed an average of 1.1 behavioral engagement indicators during whole-class instruction.

Figure 2. Graph of behavioral engagement indicators for focal students. This graph illustrates that students in both groups were more behaviorally engaged during small-group instruction than they were during whole-group instruction.



All six focal students showed more indicators of behavioral engagement during small-group instruction as compared to whole-class instruction, as well as the small-group projected data. I projected that students would, on average, show 5.2 indicators of behavioral engagement during small-group instruction. In reality, students in Intervention Group 2 exhibited an average of 41.7 behavioral engagement indicators during Phase One, and 42 indicators during Phase Two. Students in Intervention Group 1 demonstrated an average of 15 indicators of behavioral engagement during Phase One, and 37 indicators in Phase Two.

These data, therefore, suggest that students in both small groups were more behaviorally engaged during small-group instruction than they were during whole-class instruction (Jansen, 2012). Even when the size differential between the whole-class and small-group instruction was controlled for, students still showed notably more signs of behavioral engagement during small-group instruction. Students in Intervention Group 2 exhibited almost an identical number of behavioral engagement indicators during Phase One, when students participated in small-group differentiated instruction, and during Phase Two, when students completed LFHC tasks. This suggests that both instructional strategies were an effective way to behaviorally engage higher performing students.

Students in Intervention Group 1, however, showed significantly more indicators of behavioral engagement during Phase Two (37 indicators) as compared to Phase One (15

indicators). This suggests that the use of LFHC tasks is a way to more equally engage students at both ends of the achievement spectrum (Cohen et al., 1999).

Implications and Conclusion

The culmination of data suggests that flexible small-group instruction can, in fact, be used to enhance both conceptual understanding and behavioral engagement for students at opposite ends of the achievement spectrum. Future research is needed to further investigate the use of flexible groups, however this research suggests that differentiated instruction and low-floor-high-ceiling tasks are both promising tools for targeting the unique needs of advanced and intervention small groups. Students in Groups 1 and 2 all showed signs of growth in conceptual understanding and behavioral engagement.

We believe that these instructional practices and findings may be generalizable to other classrooms with similar populations of students. Many teachers face the challenge of simultaneously catering instruction to students with different learning styles, needs, and strengths. This research suggests that flexible ability level grouping and LFHC tasks have the potential to differentiate instruction effectively.

Maya Angelou once said, "….in diversity there is beauty and there is strength." While most educators would agree with the wisdom behind this quote, we believe many would also add that effectively meeting students' diverse learning needs is one of the most challenging and worthy classroom goals. This inquiry project explored strategies of a first-year teacher that allowed her to meet her diverse students' needs and support *all* students in succeeding in the classroom, offering a glimpse into the potential of small-group instruction that encourages students to be involved in the learning process.

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Appendix A: Quiz Rubric

Adapted from Smarter Balanced Mathematics General Rubrics

Retrieved November 11, 2015 from https://www.smarterbalanced.org/wp-content/uploads/2015/08/Smarter-Balanced-Mathematics-General-Rubrics.docx.

0	1: Partial Understanding	2: Reasonable Understanding	3: Full and Complete Understanding
Student did not attempt problem/answer is not interpretable	Student's response contains some of the attributes of an appropriate response. However, the response shows evidence of insufficient mathematical knowledge, errors in fundamental mathematical procedures, and/or other omissions or irregularities.	Student addresses most of the task in a mathematically sound manner. The response contains sufficient evidence of the student's competence in problem solving, reasoning, and/or modeling, but not enough evidence to demonstrate a full understanding of the processes he or she applies to the specified task.	Student addresses the task in a mathematically sound manner. The response contains evidence of the student's competence in problem solving, reasoning, and/or modeling, and contains the correct final answer.

Appendix B: Phase One: Pre and Post Interview Data

Conceptual Understanding of Division

A = Advanced, I = Intervention

Code	**Student Example(s)**	**Focal Students**	
		Round 1 Pre-Interview	Round 4 Post-Interview
Student recognizes that multiplication is the inverse operation of division.	"Because dividing is like the opposite of multiplication…"	Sammy (A)	Sammy (A), Megan (A)
Student identifies that multiplication is a concept related to division.	"It's related to multiplying."	David (A)	Sammy (A), David (A), Alex (I), Diana (I)
Student identifies that multiplication is a necessary skill for performing division successfully.	"Like knowing your times tables." "To divide you need to practice your multiplication."	Sammy (A), David (A), Brandon (I)	Sammy (A), Megan (A), David (A), Alex (I), Brandon (I), Diana (I)
Student identifies that division can involve other mathematical operations.	"We use subtraction in division. And we have to use multiplication."		Megan (A), David (A), Alex (I)

Appendix C: Phase Two: Interview & Written Response Data

Conceptual Understanding of Area and Volume

A = Advanced, I = Intervention

Code	**Student Example(s)**	**Focal Students** Round 5 Pre-Interview	Round 5 Written Response	Round 6 Written Response
Student gives a vague example of a scenario in which area or volume applies.	"Say you're building a house. You need to find the area to be able to make it perfect."	Alex (I), Brandon (I), Diana (I), Sammy (A), Melany (A)		David (A)
Student gives an example of a specific scenario in which area or volume applies.	"When you're going to paint a room, you use area to know how much paint to use."	David (A)	Sammy (A), Megan (A), David (A), Alex (I), Brandon (I), Diana (I)	Sammy (A), Megan (A), Alex (I), Brandon (I)
Student correctly identifies and describes the operation used to solve the situation described in the scenario. OR Student correctly solves the situation described in the scenario.	"You would multiply the base times the height." "You would use the A=bh formula."	Sammy (A), David (A), Brandon (I)	Sammy (A), Megan (A), David (A), Diana (I)	Sammy (A), Megan (A)

PROSPECTIVE TEACHERS LEARNING TO ENGAGE RELUCTANT WRITERS: THE POWER OF EXPERIENTIAL CRITICAL LITERACY PEDAGOGIES

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Abstract. The purpose of this author's own classroom inquiry was to document the process of prospective teachers' learning to engage reluctant writers by participating in a *living language workshop.* This was the primary scenario in which they experienced firsthand the pedagogy they were learning about. The sources of data were students' course work, portfolio evaluations, course evaluations, and the instructor's reflective journal and notes. Most pre-service teachers embraced these critical literacy pedagogies, but there were also resisters. Course participants experienced firsthand the effectiveness of these pedagogical strategies with students at their practicum schools.

Keywords: Teacher education, critical pedagogy of language, critical literacy, writing with purpose, living language workshop, experiential pedagogy

Introduction

At last, critical educators have been able to 'connect the dots' to reveal who is behind the disastrous educational policies and the growth of the educational-industrial complex (standardized tests, textbooks, teaching materials, commercialization of schools, tutoring, teacher training, online courses, alternative certification programs, school closings, for-profit charter schools, and so on). The issues surrounding such policy change have now been documented by both researchers and practitioners (Schneider, 2014, October 26; Schneider, 2014; Ravitch, 2014, January 28; Ravitch, 2014). Importantly, we now have a better historical perspective of when this comprehensive and systematic attack on public education started, and recognize that it is mostly based on fabricated myths and crises (Berliner, 2014).

As a teacher educator and researcher of my own teaching of critical literacy, I felt a responsibility to dig into what I could not explain as accidentally correlated events. For instance, the demands and implications of policies, starting with the No Child Left Behind Act (2002) and its sequels, which have intensified high stakes standardized testing, the privatization of school services, and the discrediting and dismantling of public education, teachers, and community schools. It is clear by these actions that we are witnessing the implementation of the neoconservative / neoliberal market-driven agenda, which holds that public education (and, indeed, all public services) will improve if privatized (Anyon, 2005; Apple, 2006; Berliner & Biddle, 1995; Demarrais, 2006; Emery and Ohanian, 2004; Hursh, 2008; Kohn, 2004, Kumashiro, 2008).

Literature Review

The latest education policy Every Student Succeeds Act (US Department of Education, 2015), in the words of President Obama (President Obama, 2015), asserts that ESSA is meant to fix NCLB concerning its "too much testing"; "cookie cutter results", "one size fits all" approach to educational problems. Although Schneider (2016) points to ESSA's elimination of the Common Core Standards testing component, Stotsky (2016) indicates that Lamar Alexander, the leading sponsor of the bill, assures educators that ESSA continues measures of academic achievement, disaggregates data, and cedes to each state's schools, teachers, and parents the decisions concerning scores and their improvement. This confirms the continuation of standardized testing and the requirement by the federal government to test 95% of the students in order to receive Title I funding.

By studying these educational policies, prospective teachers can learn about the conditions under which they are going to work, which can be an opportunity to develop a critical view of those policies. Concerning literacy, I have learned from experience that it's necessary to provide scenarios for prospective teachers to facilitate their understanding of the meaning of "critical" in 'critical literacy'. As Edelsky and Cherland (2007) illustrate, the 'popularity effect' of critical literacy has led many good teachers to claim they are "doing" critical literacy, even though they are not examining systems of oppression with their students (e. g. dominance, privilege injustice, inequity, segregation), and taking action upon those issues at school or local levels. As critical educators, our work includes digging into the origins, history, and workings of the regressive forces behind policies, practices and campaigns that de-professionalize teachers, bash teachers' unions and public schools, corporatize schools, and consequently harm children, youth and the future of this nation.

Under the corporate takeover of schools and educational policies, many problems have been created. Hursh (2008) documents those 'reforms' that have caused the real crisis of the education system in the United States and worldwide; but nothing of this appears in the corporate media, even though the evidence is abundant. Part of the conservative/neoliberal agenda (Demarrais, 2006) is precisely to have a well-organized

media system that amplifies and repeats their messages, no matter the facts and research evidence. Who are to blame for the decline of education but teachers, children and families who are not doing what they are supposed to do?

Reluctant writers are easily created in this manufactured crisis, which has caused the real crisis of the education system. The latest literacy policies, such as Reading First Initiative (No Child Left Behind) and Common Core (Race to the Top), are regimes of top-down standards and standardized testing, which control to a great extent what to teach and how to teach. The new 'bottom line' is raising achievement scores, not the relevance of schooling to students' lives and interests, nor the content and the pedagogy for teaching literacy. In elementary school the practice of writing is often an ancillary activity, coming after reading time; it is mainly assigned but not taught; and when it does occur, writing is almost always solely for writing's sake. Consequently, writing becomes an unpleasant experience, with no purpose or meaning. We should not be surprised that students, as would many other intelligent people, shrink from writing as a defense mechanism. Knowing the most realistic explanation of the 'why' of reluctant writers, we can address the problem with a higher probability of success.

Uprooting and Countering the Real Causes of Reluctant Writers with Critical Literacy Pedagogies. Several large-scale studies have shown the ineffectiveness of the *Reading First Initiative* (NCLB special component) for teaching literacy in elementary schools (NAEP, 2009; National Center for Education Evaluation, 2008). Obama's Race to the Top (RTTT), with the Common Core State Standards (CCSS) continues the same trend: top-down standards and standardized testing, which drives everything in schools, squeezes teacher autonomy and dismantles democracy in the classroom. Concerning literacy, the CCSS at least recognize writing as a subject matter that needs to be taught. However, this reform clearly does not have the interests of children at heart. On the contrary, it is "NCLB on steroids", as Krashen (2010) puts it; it is a rainmaker of federal money to make even more money, rather than a redeemer (Pennington *et al*, 2012). The CCSS, Schneider (2014) explains, from her own experience as a classroom teacher, are actually national standards, which the federal government cannot impose directly on states but somehow forces the states to accept, along with the tandem standardized tests, in order to receive federal funds: "It was requiring the states to agree with the CCSS in order to escape the pain of NCLB for the fire of RTTT." (p.165).

In her keynote speech to the 2014 Modern Language Association meeting, Diane Ravitch (2014) connects the dots about what we need to know about the Common Core Standards: who developed them, who supports them, whose interests are served, why the rush to their adoption, and who are sidelined as the CCSS are pushed on the states in exchange for federal money. The conditions attached to this federal largesse are: raise students' test scores; evaluate teachers depending on those scores; increase privately managed charter

schools; and reconstitute or "turn around" schools whose students are not achieving the expected test scores. These Draconian measures may include firing the school personnel and putting the school under private management, or closing it. These conditions are the materialization of the neoliberal/neoconservative agenda to dismantle public education and turn it into a profitable business for special interest groups. Ravitch also notes that among the supporters of this agenda are Arnie Duncan (secretary of education in the Obama administration), Bill Gates, Joe Klein, Michelle Rhee, Exxon Mobile, and the Chamber of Commerce, to mention a few. Given that literacy is one of the two major components of the CCSS, the teaching is completely conditioned to these standards and their accompanying standardized tests.

Poor, and mostly minority, students are 'tracked' at lower levels, which harms them not only academically but psychologically; and it is a commonplace that the poor and minority schooling experience is that of unchallenging curricula, prescriptive programs, less experienced and qualified teachers, more irrational practices, and more pressure to raise scores in standardized testing (Gandara & Rumberger, 2009; Garcia, 2000; Oakes, 1985; Valenzuela, 2005). Hence, these tracked (so declared or not) students have no chance to develop sophistication and confidence in their academic writing (Breeze, 2008). A common practice in teaching writing at schools is to emphasize grammatical correctness at the expense of purpose, meaning, and creativity (Valdes, 2001). The unequal and inequitable education that students from poor and minority backgrounds face throughout the school system leads one to conclude that the education system and its failing literacy policies itself produces the reluctant writers we find in schools and colleges. An alternative theory to explain this chronic injustice is advanced by Ladson-Billings (Ladson-Billings, 2006) as the theory of "education debt". For her, the accumulation of deficits along the whole US schooling process for non-white students explains far more accurately the so-called 'achievement gap'.

To make a difference with students who already struggle with writing, we need to implement critical literacy pedagogies that: a) integrate social justice issues as the substance of reading, writing and speaking — the basic components of the language arts curriculum; b) place students' lives at the center of the curriculum; c) use the newly acquired knowledge about policies and skills (e.g. writing letters) for social justice activism; and d) build socially responsive curricula from the bottom up. The notion that literacy is the "reading of the word and the world" (Freire & Macedo, 1987) is profound and comprehensive, yet it clearly helps us understand what critical literacy is about. If we learn to read and write by reading and writing our worlds, literacy becomes an instrument of social action and empowerment (Shor, 1999).

Embracing critical literacy implies that we are always asking hard questions, which children also should ask, about what they read, hear or witness: Is this fair? Is this right? Does this

hurt anyone? Who benefits and who suffers? Whose voices are suppressed? (Sweeney, 1999). Critical literacy pedagogies should provide students, including children, with opportunities to question (Freire & Faundez, 1989) and understand the world in the light of social justice ideals.

How can prospective teachers be engaged in learning critical literacy pedagogies? Following Dewey's (1938/1963) notion of 'experiential education' and the Bakhtin Circle's (Bakhtin, 1986; Voloshinov, 1973) idea of 'living language', I have put together a *living language workshop* that serves as the scenario for these teachers to experience the pedagogy they are learning about firsthand. It thus becomes a sort of *experiential pedagogy.* For Bakhtin (1986) living language is the most appropriate subject matter of language studies, and refers to the language in actual use, the utterance or discourse that happens in socially organized human activities. Language is therefore the link of all human activity and the primary data of human and social sciences. The stress on living language is in contrast to the structuralist view of the study of language, which Bakhtin refers to as a self-contained system of grammar rules, phonemes and lexical content which is semantically closed and consequently not alterable by language users. He referred to it as dead language. By 'living language workshop' I mean the segment of the class period when pre-service teachers engage in writing, after I demonstrate for them the strategies to get students to write authentic texts (connected with their life experiences, life projects, goals and aspirations).

Methodology

Purpose of Study. The author, a teacher educator and researcher of her own classroom of language arts pedagogy, examines and documents the successes and challenges concerning: 1) teaching critical literacy pedagogies through a *living language workshop*; 2) devising learning scenarios for prospective teachers to experience, themselves, the critical literacy pedagogies, thus facilitating their application in their own classrooms; 3) responding to the demands of schools and the literacy mandates of the state by boosting prospective teachers' creativity and understanding in order to change meaningless and purposeless mandated literacy practices into living, engaging, empowering, anti-oppressive ways of teaching and learning.

Studying my Own Teaching. The self-study of one's own teaching and classroom practice is a research paradigm in its own right (Pine, 2009; Samaras, 2002; Cochran-Smith & Little, 1994; Elliot, 1991). Pine (2009) synthesizes the fundamental practices of teacher action research such as intentional and systematic mindful reflection, focused observation, documentation, collegial dialogue, journaling and writing. Studying our own practice makes teacher action research a distinctive paradigm constituting an "epistemology of practice", as Schön (1983) calls the performance of a reflective practitioner. The ultimate goals of this inquiry include: 1) transformation in the understanding of our practice; 2) transformation of our practice by using the new understanding; and 3) transformation of the conditions in which our practice takes place (Carr & Kemmis, 1986).

Participants and Setting. This paper is a synthesis of patterns of achievements and challenges, and the emergence of the author's ongoing classroom research--Language Arts Pedagogy--during a 10-year period, in a middle-size state university in the southwest US. Participants are prospective teachers in their senior year prior to their student teaching semester. Too many of my undergraduates, and even my graduate students, have an academic history of being struggling writers, especially those coming from poor and/or minority backgrounds, for many of whom English is their second language. They have experienced firsthand a system of education that is in debt to them. This is why in my course I also include the development of participants' writing skills while learning how to teach their own students how to write with meaning and purpose.

The courses of the elementary teacher education program at the senior level are organized in two blocks, A and B. Students take the courses of their block together. When prospective teachers enter block B, they have spent a semester together as block A. This allows them to develop a unique group dynamics, which often is carried into Block B. At any rate, as their instructor of language arts pedagogy in block B, I am to some extent an outsider to the class, which impacts the development of a relationship with individual students in the class. Of course there have been other factors that directly affect the degree of success in teaching critical literacy pedagogies, as I will describe later in this paper.

By and large, the overarching structure of the classroom activities is what I call a *living language workshop.* This evolution of the 'writers' workshop' is what I used in the first semester I taught this course. The main reason for this perspective change was based on my own observations of writing at nearby public schools and what the students themselves observed in their practicum. The writing assignments were hardly inviting and meaningful for students: "write two sentences"; or "write the responses to the questionnaire…"; or "respond to the questions at the end of Chapter X". At the same time, in my class, I became aware of some difficulties several course participants had in trying to engage in writing. I found it helpful to engage course participants in various activities involving reading, writing, and speaking (dialogue) about social issues and life experiences which were connected to or helped trigger participants' interests and memories.

Data Sources. As is often the case, data sources in teacher action research originate as part of the process of teaching and from the students' coursework. In this study the data came from: the instructor's reflective journal after each class session, which gave me the basis for preparing the following lessons, changing the syllabus' thematic units, assignments and activities, as well as students' writing projects; lesson plans; reflective journals; students' self-assessment and students' course evaluations; and practicum lessons and reports. As each semester went by, I took notes of participants' work, reflections, practicum reports, and evaluations, in order to make the necessary changes for the next semester.

Building the Conditions to Enthuse Reluctant Writers. In the context of the living language workshop, prospective teachers had the opportunity to face their own resistance to engage in writing while learning strategies and activities to use in their respective classrooms. This implies that, as their instructor, I needed to model those strategies and activities for them so that they could experience how they felt as well as understand them conceptually and practically.

Thematic Units. Each thematic unit of the course in language arts pedagogy includes modeling how to introduce a particular writing genre and connecting it to a social issue, depending on which reading, writing, speaking, and action activities are planned and developed. These activities also help me and course participants to start exploring the issues that concern them, thus introducing their life experiences into the curriculum and increasing their chances to engage in meaningful and purposeful writing. The course consists of broad thematic units based on predominant writing genres (poetry, narrative, essay writing), plus critical media literacy and alternative, authentic assessment of writing. Keeping track of what issues matter to students helps me plan the following class activities and thematic units. For the most part, this day-to-day planning of activities works well, yet some 'hot topics' provoke often heated debates and splits, for which in the end I get most of the blame. Those situations can be very stressful but also engender reflection and careful planning for later course development.

Experiential Pedagogy at Work. Dewey (1938/1963) called *experiential learning* his theory of "learning by doing". In this self-study of my own practice, I used this concept to explain how prospective teachers can learn critical literacy pedagogy through experiencing that pedagogy themselves. For every thematic unit and the accompanying writing genre, we started by modeling the type of pedagogical procedure I want prospective teachers to adopt for their lesson plans to teach the same genre to school children. I explained to them how it feels to get excited and emotional when writing about their own experiences and thereby finding meaning and purpose in writing, not just writing for the sake of writing. This experience will help them to devise writing activities such that children find meaning and purpose in their writing beyond the schoolwork type of writing they are often assigned to do.

Example of a Thematic Unit and a Lesson for Engaging Reluctant Writers. As basic textbooks, I used Linda Christensen's (2000) *Reading, Writing and Rising-up,* and *Teaching for Joy and Justice* (2009). These books have a wealth of ideas and activities for teaching critical literacy and, especially, are 'reluctant-writer proof'. An additional package of readings includes Freire's chapters on literacy or on problem-posing pedagogy. I also developed several activities and exercises to involve small children in writing, since Christensen's books are mostly for teaching at high school level. The vignette that follows is

an example of how I developed the thematic unit one, which includes the narrative writing genre.

Vignette 1: Thematic Unit: Writing Our Lives for Joy, Healing, and Advocacy

Writing Genre: Narrative Writing. The overall objective of this unit is to have students experience what it feels like to write narratives with authentic purpose and how to teach narrative writing to elementary and middle school students.

Sample Lesson: *Writing a personal narrative. "*I know what it's like … I remember one time..." The main goal of this lesson was to create a situation that could unlock participants' resistance to engage in writing by changing the purpose from writing for mere practice to writing with purpose, to unleash emotions and put them into words that have deep meaning for them.

I passed out to each student a copy of at least 3 poems (e.g. "As Live was Five") from Jimmy Santiago Baca's book *Healing Earthquakes* (2001). We first had a conversation about the author, who despite having roots in the same state, is largely unknown to students. We watched him speaking (Baca, Barchus & Krusic, 2003), explaining how each poem is a narrative of a life experience that left a scar on his soul, and that writing poetry saved his life, was a healing experience, and became the path to literacy. Then, in a read-around manner, each participant read a stanza of a poem with good intonation and enunciation, until we finished all three poems. Then we heard, in Jimmy Santiago Baca's voice, the poem "As Live Was Five". This poem is a narrative of his first experience of racism against his grandfather, which was a very traumatic experience for a ten-year-old boy. After listening to the poem, I passed out a list of about 15 different common situations where people can be victims of discrimination or any other traumatic situation. The handout is called "I know what it's like… I remember one time…". For instance, "I know what it's like to be told by my teacher that I will not be successful in school. I remember one time...". I invite participants to choose any such situation that brings back a memory, and to write freely and as long as needed. Often they asked me if they needed to share, to which I responded that it isn't mandatory. Using these prompts, everybody wrote continuously for about 20-30 minutes. If we had some time left, a couple of volunteers read their first drafts.

For the following class, course participants needed to complete their narratives, make revisions and edit as necessary for reading to the class or to a small group of classmates. They read and gave feedback to each other to improve the formal conventions of writing. I also read to the class a healing narrative piece. During the readings there were always tears, laughs, suspense, and demonstrations of mutual empathy. At this point some narrative devices were introduced such as character descriptions, dialogue, setting descriptions, etc., aimed at improving their skills for narrative writing and revising and editing their own narratives.

As prospective teachers engage in this process of narrative writing, they are learning a specific empowering strategy for teaching personal narrative writing to their own students. Then, we reconstruct the process that they went through to learn the art of personal narrative writing: the reading-around of the poems of Jimmy Santiago Baca or any other poet's samples; the conversation about the author; his own reading of a poem based on a very intense experience to build an emotional atmosphere that helps trigger memories in the listeners; the extensive list of common situations as prompts to trigger memories; the sharing of those readings with peer feedback; and finally the more formal techniques of narrative writing to facilitate revision and editing. I encouraged prospective teachers to use this same narrative (if appropriate) to trigger their own students' memories to start writing about their experiences.

To complete this lesson, participants worked in pairs on writing a lesson plan for teaching personal narrative writing to their students in grades 4-8. If allowed by the cooperating teacher in their practicum schools, prospective teachers taught this lesson and shared their teaching experience with the class the following week.

Even in the lower grades, students can write personal narratives when given examples they can identify with. We read Laliberty's (2001) chapter, written by a second-grade teacher who 'hooks' students into writing by engaging them in writing about their own life experiences. She modeled for those second graders her own sad story of her father's absence. She also scaffolded the second grade children's preparation for starting the writing of their individual narratives, by writing various narratives as a whole class.

Contrary to the widely-held belief that it will be difficult to have course participants consent to share these very personal narratives, my own experience is that very few choose not to share their writing with the whole class. Perhaps their studying together for more than one semester in Block A creates mutual trust in the group as they enter block B. On a couple of occasions, there was a student who considered Jimmy Santiago Baca 'inappropriate' for teaching at school because of his denunciation and confrontation of racism. Depending on course participants' openness, I chose his or less intense narratives as triggers of writing. The selection of the narrative examples was carefully done, and is a key component in the process of creating the emotional atmosphere needed to trigger memories.

Analysis of Data: In a teacher action research project, the teacher continually examines the various sources of data (students' writing projects, class participation, lesson plans, and reflection on her/his own practice journal) for making decisions about the following lessons, activities, emphasis and repairs. As a teacher researcher, I do so as an ongoing process during the semester. I also take notes for documenting participants' understanding and

appropriation of the pedagogy of living language by examining their writing projects, lesson plans and practicum reports. I especially look at how authentic was their writing and the ways they recreated in their own lesson plans the pedagogy they had experienced themselves, as well as their success as judged from their students' work. At the end of each semester, I review my after-class journals, the notes taken from the assignments submitted concerning their understanding and appropriation of living language pedagogy, and to identify broad transformations and issues of course participants and of myself, which allow me to prepare the following semester syllabus, including assignments and activities. What I present in this report are the broad and prototypical changes acknowledged by prospective teachers who participate in my courses of language arts pedagogy. Furthermore, I also found those changes in my journals and field notes from evaluating their portfolios where all their work was compiled. In other words, their own acknowledgement and my own records and observations of their changes ratify this conclusion.

Results and Discussion

Significant Transformations of Pre-service Teachers: If I Can Do It Now, My Students Could Do It Too. Even though the prototypical changes were identified from different data sources including direct observations consigned to my journal, the place where they were most clearly stated was in participants' portfolio self-evaluations and in the overall course evaluations. Some of these statements are reproduced here to illustrate the patterns of change.

1. Feeling the relevance of their own experience by engaging in writing as inspiration to create learning situations to engage their own students:
    - I enjoyed writing a story that touched my heart. It was hard to get started but once I started I did not want to stop writing until I finished… I think children will have the same experiences in writing about themselves (Lucinda, midterm self-evaluation, 2006).
    - I enjoyed getting the chance to interact with one another in class. The activities that you provided were engaging and I feel comfortable using them in my class. I learned to see things more critically (Nina, 2005, final self-evaluation).
    - I think the main thing that I learned from doing all the work in this portfolio is the importance of somehow including students' lives in the writing that they do, no matter what type of writing it is. This is crucial to making writing an enjoyable and meaningful experience for our students. They can also take action by writing about an issue that they care deeply about (Jane, final self-evaluation, 2007).
    - Coming into this class I thought we were going to study grammar, mechanics, and literary elements. Well, we did all that and a whole lot more. I learned the importance of valuing students' lives and how to use that to empower their writings (Anonymous course evaluation, spring, 2003)
2. Some participants found the activities and writing in class useful for improving their knowledge about language arts and their writing skills:

- I wasn't too excited when I saw the title of the chapter. I hated poetry throughout school. As I was reading I was kind of glad to see that there are better forms to teach poetry to kids. I always looked at poetry as something that somehow had to rhyme and not really make sense (Laurie, journal on poetry writing, 2005)

3. Feeling empowered, validated and willing to share
   - I am very pleased because in this course I had the opportunity to practice my native language. In this class I felt valued and respected, and I am going to do this to my students. As a future teacher I will respect my students for who they are and who they will be. .. My writings in Spanish in this portfolio are very important to me, because during the time I have been in this university I never had the opportunity to do so (Lola, final self-evaluation, 2003)
4. Feeling ready and prepared for teaching language arts at schools by connecting the university course with the 'real world'.
   - In trying to look back in my practicum experiences, I still think that this is the first and only time that I have seen something (poem) in the classroom that relates back to what I have read or been taught in my classes (Laurie, practicum observation report, 2005).
5. Sharpening prospective teachers' critical thinking and their commitment to provide their students with learning situations to develop critical thinking as well:
   - I am more aware of issues around my life. I look at things more critically and I feel that I will be able to share that with my students. I also think that it is important to teach your students to be critical thinkers. Overall, I feel very good about this course. I learned a lot and I had a lot of fun. Thank You! (Naomi, final self-assessment, 2004).

The thematic unit on Critical Media Literacy is the occasion for prospective teachers to examine how critical they are, as well as to engage in taking action which often is in the way of writing advocacy letters to media outlets and programs aimed especially at children. They also developed lesson plans to teach children critical media literacy (e.g. identify stereotypes in cartoons) and how to write self-advocacy letters.

Not everybody found the content and pedagogy of the course useful. Some students (roughly 2-3 in most of the classes), found them offensive and reflective of my political agenda, which I only found out in the anonymous course evaluations: "This teacher (a liberal) was constantly pushing her political agenda on the class. I was highly offended" (2007). Another student wrote: "We need a new professor that focuses more on methods and less on politics" (2010).

I was not surprised to find some students resisting a critical literacy perspective for teaching language arts. After all, most of these students have been ingrained with the more

traditional teaching of language that reinforces their own experiences and views of teaching.

Limitations

A limitation of this study is that student transformation is mostly based on self-reporting of their own learning experiences, as well as what they present and write in their practicum reports. In this university, field supervision is separated from the courses on methods. During these ten years I only supervised 6 students in their student teaching semester following my course on language methods. Two of them were very skillful in combining their cooperating teacher requirements with the type of language pedagogy they had learned in my class. Two other students moved back and forth between the cooperating teacher pedagogy and their own learned pedagogy. The rest just followed the cooperating teacher's pedagogy and told me that when they had their own classroom they would use the living language pedagogy they had learned.

Conclusion and Implications

Reluctant writers are for the most part the result of teaching practices and education policies that focus on discrete skill development through writing assignments only for the sake of writing. Writing, if it occurs at all, is a schoolwork exercise, which often becomes meaningless and purposeless, and has no authentic connection with students' lives as expressive beings and agents of change. The teacher action research reported here aimed at countering these malpractices by facilitating pre-service teachers to experience critical literacy pedagogies. These practices are about teaching writing that triggers students' life stories, engaging them as expressive beings in authentic writing for meaning and purpose. Experiential pedagogy provides pre-service teachers with the embodied reasons and skills, that is, experiential knowledge and practice for teaching writing

The experiential pedagogy for teaching writing I describe in this paper did not exist when I started teaching this course of pedagogy of language. It was the result of my reflective practice of teaching this course, progressing from just reading and talking about how to teach writing, hoping to construct authentic texts, to embracing experiential pedagogy as described in this paper. Examining critically my own practice and the students' course work, especially their lesson plans and practicum reports, I found no clear indications that our readings and examples were reflecting in their practicum. Actually, course participants were using their own experiences of writing in schools with a bit more 'fun' activities, not the authentic writing we had been reading and talking about in class.

I kept records of students' work and my own journals and notes for various years, but I did not go back to examine more thoroughly the data accumulated. I came to realize that in teacher action research data analysis goes parallel to teaching. This implied that I needed to be analyzing the results for the purpose of preparing my own teaching of the course as well as for revision of the course for the following semester, in addition to my research on this process. I started developing a strategy for the analysis to happen in a systematic way and not just at the end of the semester or multiple year periods. In other words, analysis of data became part of my own teaching of this course. At this point I understood what Cochran-Smith & Lytle (1993) and Pine (2009) have stressed: that in teacher research, teaching and research become intimately connected one to the other. Therefore, a very important part of the report on a teacher action research project is to document the process of teaching while doing research on our own teaching, as opposed to using a questionnaire or test to assess our teaching.

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