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About the Journal

Founded in 2013, the Journal of Teacher Action Research (ISSN: 2332-2233) is a peer-reviewed online journal indexed with EBSCO that seeks practical research that can be implemented in Pre-Kindergarten through Post-Secondary classrooms. The primary function of this journal is to provide classroom teachers and researchers a means for sharing classroom practices.

The journal accepts articles for peer-review that describe classroom practice which positively impacts student learning. We define teacher action research as teachers (at all levels) studying their practice and/or their students' learning in a methodical way in order to inform classroom practice. Articles submitted to the journal should demonstrate an action research focus with intent to improve the author's practice.

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INTRODUCTORY ATTEMPT AT THE DEVELOPMENT OF CRITICAL CONSCIOUSNESS: LESSONS LEARNED

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Abstract The action research study presented critically examines curricular choices such as text selections, field placements and the sequencing of learning experiences in an introductory methods course to identify supports for the development of critical consciousness in preservice teachers. Preservice teacher journal assignments were analyzed to look for moments of critical consciousness. Findings point to themes that largely fall short of critical consciousness development and highlight potential mismatches between text selections, field placements and course sequencing in the field for supporting the development of critical consciousness in preservice teachers. These mismatches may be centered around the timing of texts with field placements and the number of field hours required to form meaningful student-teacher and mentor-preservice teacher relationships to support critical consciousness. Recommended revisions to course syllabi and field placement requirements that might better support critical consciousness are discussed.

Keywords: teacher action research, teacher preparation, critical consciousness, White teacher identity

Introduction

As our nation and our schools are becoming increasingly diverse, it is important for teacher preparation programs to mirror this diversity in the demographics of its faculty and preservice teacher candidates. It is also important that the curriculum and experiences offered in teacher preparation programs prepare preservice teachers, who remain at this time predominately White and female, for work with students of color in diverse settings.

Part of this preparation is curriculum and field experiences that might awaken critical consciousness of preservice teachers. Critical consciousness is "the ability to recognize and analyze systems of inequality and the commitment to take action against these systems" (El-Amin, Seider & Graves et. al p. 18). The work of Freire (1998) describes moments of critical consciousness as moments of awareness around race and class where marginalized people are able to "see, judge and act" on oppressive practices and policies. This action research case study sought to understand the following questions:

1. How do method course curriculum and field placements foster the development of critical consciousness in preservice teacher candidates as evidenced in reflective journal writing and related course assignments?
2. What revisions to course curriculum and field placements might better support the development of critical consciousness in future course offerings?

Most teachers for students of color are White, middle-class females who do not share the same race or class as the students they teach (Love, 2019; Nieto, 2003). To prepare this demographic of teachers for service for and with students of color, university teacher preparation programs have sought to include content around culturally relevant pedagogies, differentiation of instruction and classroom management strategies. Additionally, field experience placements with diverse groups of students are sought. These efforts, however, often lack program coherence. The problem remains that culturally relevant theory and practice are taught in isolation, or as one of many approaches, for methods, lesson planning and field experiences in teacher preparation programs (Cochran-Smith, 2012; Ladson-Billings, 2009; Schauer, 2015, 2018). This approach also affords limited opportunities for preservice teachers to engage in their own identity development through reflective practices that might awaken critical consciousness, foster strong relationships with students of color, and influence the adoption of culturally relevant pedagogies and practices (Schauer, 2015, 2018).

The purpose of this study was to explore ways that an introductory method course curriculum and associated field placements may foster the development of critical consciousness in preservice teacher candidates as evidenced in reflective journal writing and related course assignments. From the findings, revisions to course content and field placements will be considered and studied in an ongoing cycle of action research. Related studies (Bloom & Peters, 2012; Groff & Peters, 2012; Howard, 2010) have researched the implementation of culturally relevant curriculum and field placements to support critical consciousness in general descriptions where courses do or do not incorporate these strategies. However, few studies have examined specific text selections and the sequence of class learning experiences to awaken critical consciousness in preservice teachers.

Literature Review

Critical Consciousness. The concept of critical consciousness was developed by Freire (1998) and was primarily focused on the conscious minds of the oppressed, rather than those who sought to aid liberation, such as teachers. Critical consciousness is comprised of three components: critical reflection, political efficacy and critical action or to use Freire's terms

"see, judge, act" (Gibson, 1999; Watts et al., 2011). Freire's conceptualization of critical consciousness has been expanded to include the experiences of dominant groups as they work with marginalized populations and become awakened to oppressive systems (Ladson-Billings, 1998). Once teachers are awakened to structural inequalities and have a desire to challenge these structures, they often adopt pedagogical strategies that serve to empower and transform. These pedagogies have been termed culturally relevant in the research of Ladson-Billings (2009).

Whiteness and Teacher Identity Development. A first step in the development of critical consciousness is an ability to see one's identity as it is positioned within social and structural systems of power (Freire, 1994; Kendi, 2019; Watts, 2011). Racial identity is particularly salient because it was constructed by Whites to separate themselves as superior to people of color (DiAngelo, 2018; Kendi, 2019). According to Cochran-Smith (2012), teacher identity is formed through the intersection of beliefs, prior life experiences, opportunities for on-going professional support and the context of the school environment. To move beyond colorblind views and deficit approaches to pedagogy and policies, White teachers need to engage in opportunities for critical reflection and action that are on-going and reiterative. In this way, learning to teach becomes "a process and not an event" (Cochran-Smith, 2012, p. 109). This framing of becoming a teacher is similar to Freire's conception of critical consciousness where reflection leads to action and action leads to further reflection (Andrews et al, 2018). As White teachers are able to see that inequities in school are the result of structures of oppression rather than personal deficiencies in their students, they tend to adopt policies and pedagogies that are equity oriented and culturally relevant (Gorski, 2016; Ladson-Billings, 2009; Love, 2019).

Culturally Relevant Practices. For Freire, no form of education could be neutral; all pedagogy is a call to action. "Education either functions as an instrument which is used to facilitate the integration of generations into the logic of the present system and bring about conformity to it, or it becomes the 'practice of freedom', the means by which men and women deal critically with reality and discover how to participate in the transformation of their world" (Freire in Mayo, 1999: p.5).

The adoption of culturally relevant practices is one way teachers can demonstrate an action stance of critical consciousness. Culturally relevant teaching is defined as using the "cultural characteristics, experiences, and perspectives of ethnically diverse students as conduits for teaching them more effectively" (Gay, 2002, p.108). Over the past two decades, efforts to redefine and reclaim culturally relevant pedagogies has been explored. Ladson-Billings writes in "Culturally Relevant Pedagogies 2.0 a.k.a. the Remix" that her original intentions for culturally relevant pedagogy have taken on a life of its own and often does not include high expectations for learning and a focus around equity and justice (2014). High expectations and pedagogies centered on equity and justice are central to an action stance of critical consciousness.

A review of culturally relevant teaching and emphasis in teacher preparation programs demonstrate only cursory mention in university curriculum and a lack of emphasis in

accrediting bodies such as the Council for the Accreditation of Educator Preparation (Allen et. al 2017). As the authors state, "A teacher preparation program that does not critically interrogate race, power and privilege in the context of schools does not maintain a social justice mission and consequently does not meet the tenets of culturally relevant pedagogies" (p. 13). Culturally relevant pedagogies are not an add-on to a course syllabus; they are a mindset and should drive the entire teacher education program (Ladson-Billings, 2014).

Methodology

This action research study is theoretically grounded in critical race theory (CRT). As a construct, critical theories seek to "understand the origins and operation of repressive social structures" (Gordon, 1995, p. 572). Critical race theory was developed in the legal system in the 1980's to critique racist legal laws and practices that permeate the judicial system in America (Leonardo, 2012). In the 1990's, Ladson-Billings built on the framework to define it from an educational perspective. Similar to the legal definitions, CRT in education is understood as a construct that permeates the entire fabric of education. Leonardo (2012) notes, "Critical race theorists in education argue that race and racism permeate the entire educational enterprise, from aspirations, to spatial configurations and teacher education itself (p. 428). Critical theorists, therefore, are interested in discovering and understanding why oppressive structures exist and exploring ways in which society can be transformed.

The action research case study presented used an interpretivist lens to construct meaning from a course experience and develop changes that might better support desired outcomes around the development of critical consciousness. Action research is actions teachers undertake to understand and improve their own practice (McCutcheon & Burga, 1990). In an interpretivist study, "The researcher is interested in understanding how participants make meaning of a situation or phenomenon. The research is mediated through the researcher as an instrument, the strategy is inductive, and the outcome is descriptive" (Merriam, 2009 p.6). In action research that uses an interpretivist lens "the context of the teaching situation gains in strategic importance, the intentionality of the actors is probed, the dynamics of the social relationship are examined, and throughout the research, some degree of dialogic interaction between teacher and student is openly included (Bogdan & Bilken, 1990 p. 146). In this study, journal reflections were collected to understand ways students were or were not able to develop critical consciousness as supported by the course design and field placements. From these understandings, actions for improvement can be implemented and explored in future studies.

This study took place in a cross-listed undergraduate/graduate adolescent methods course with associated field hours, which means that both undergraduate and graduate students participated side-by-side in the course. The researchers sought to understand the following questions: 1. How do method course curriculum and field placements foster the development of critical consciousness in preservice teacher candidates as evidenced in reflective journal writing and related course assignments? 2. What revisions to course curriculum and field placements might better support the development of critical

consciousness in future course offerings? The case study method allows for an in-depth understanding of a situation that is specific to the participants involved (Creswell, 2013).

Participant Selection. Purposeful sampling was used to select the participants for this study (Creswell, 2013). In this sampling, all students that opted to participate were enrolled in an Adolescent Special Methods course that includes 30 hours of field experience in area high schools. Participants were bound together as a single unit of analysis. With IRB approval from the university, consent forms were distributed by a third party not associated with the course and 14 out of 17 students granted permission to study their journal entries and related course assignments. Of the 14 students, seven identified as male and seven as female. All identified as White except for one female and one male who identified as Latina and multi-racial, respectively. Consent forms were locked in the office of the education department until the conclusion of the semester. In this way, the professor, who is also the primary researcher, did not know which students chose to participate until the semester was over and final grades were submitted.

Course Description and Rationale for Sequence of Method. The course taught and researched for this study is an entry level methods course for undergraduate and graduate students seeking high school licensure in English Language Arts, History, Science or Mathematics. To meet university standards, it was a stated course goal that the three texts assigned for the course would help preservice teachers reflect on teaching and develop professionally as part of the Teacher as Person learning strand. In the first six weeks of the semester, students were assigned *The Dreamkeepers* by Ladson-Billings (2009) and *Culturally Relevant Standards-Based Teaching* by Saifer et al. (2011). Discussion protocols for the Ladson-Billings text were conducted with one chapter discussed each week. Similarly, the Saifer text was used in class discussions and as a reference for designing and teaching culturally relevant sample lessons to peers in the class during week five of the semester. Additionally, by the fifth week of the semester, most of the students were placed in their field assignments and the third text, *Mindsets in the Classroom* text by Ricci (2017) was introduced and discussed in class through week twelve.

Learning goals and experiences were centered around helping preservice teachers prepare to work with diverse students to meet learning strands around Context, Child and Adolescent Development and Curriculum, Learning and Instruction. To this end, students became familiar with state and national standards and lesson design that is both developmentally appropriate and culturally relevant for groups of students and individual learners. Course assignments included an initial and revised visual representation of urban secondary schools; designing a lesson taught to peers in the class with a partner; developing a multidisciplinary unit plan in groups of four; a reflective paper on the knowledge, skills and dispositions required of an effective teacher, and a revised lesson plan from one of two lessons taught at the field experience site. Detailed descriptions of these performance tasks are included in Appendix A.

Students were required to complete thirty hours at the field site. Field experience placements were made by the office of field placement to ensure students were placed by

content area and transportation needs. At the request of the researcher, field placements were prioritized at sites where at least fifty percent of the student body represented students of color. Field placements represented six secondary schools within a fifteen-mile radius of the university. According to data found on the school websites and state report cards, four of the schools have student populations where the majority are students of color. Two of the schools have student populations where most of the students are White. This placement request was met for 12 of the 14 participants in the study. The findings of this study are themes that emerged from preservice teachers placed at schools where students of color represented fifty percent or more of the student population.

From the texts read, course learning experiences and field experiences, students completed four reflective journal assignments throughout the semester to help them make meaning of their experiences. The journal entry prompts were not specific. The general prompt called for students to reflect on the knowledge, skills and dispositions toward teaching that they were considering from recent text readings, course learning activities, and field experiences. A rubric (included in Appendix B) assessed students on knowledge learned through texts and discussions, skills applied in class or field experiences and dispositions developed for becoming an effective teacher.

Data Analysis. Student journals were collected and analyzed by the authors of this study in a recursive, constant comparative process. The journal entries were analyzed independently by the researchers using NVivo qualitative software for analysis of similarities, differences, patterns, and emerging themes that became the findings of this study (Miles, Haberman & Saldana, 2013). The researchers met regularly to compare codes and see ways they aligned or needed adjustment or clarification. Once the researchers reached consensus on the codes, another reading of the data was conducted utilizing the revised codes. To ensure the trustworthiness of this study, three researchers were employed to code the data independently and then again as codes were finalized. These efforts to triangulate the data increase the credibility of the study (Lincoln & Guba, 1985).

Positionality of the Researchers and Limitations of the Method. As an action research study, the lead researcher was also the instructor of the course studied. All three of the researchers are female and two identify as White with the third identifying as multiracial. The purpose of the study was to examine moments of critical consciousness as experienced in course curriculum and field experiences. As the majority of the researchers share the same demographic as the majority of participants, it is important to recognize that White privilege could cause the researchers to miss moments of critical consciousness in the data due to the individual's own White identity development and unconscious bias.

This study is limited to a one semester methods course and the students who chose to participate. Experiences and journal reflections cannot be generalized for larger populations of preservice teachers. It is also possible that despite sharing the same demographic as most participants, the students submitted reflections that were most comfortable for them to share and left thoughts around race unwritten because they did not want to be perceived as racist.

Results

Teaching as a Skill to be Learned. Text from the student journals framed their growing teacher identity as one where they would need to learn specific skills to become an effective teacher for diverse learners. Students reflected on their positionality as primarily White students learning about diverse school settings for the first time. Students demonstrated an eagerness to learn about students of color and the strategies that might support student learning. They did not, however, frame teacher identity development as work they might need to do to unpack their own biases so they could become effective teachers for students of color. For example, in reference to the Ladson-Billings text, Lexi wrote of her need to "burst out of her bubble of ignorance" in reference to her lived experiences in predominantly White, suburban neighborhoods. She framed this needed growth through an acquisition of skills and resources to improve student performance rather than critical reflection. Both Lexi and Brad's journals highlight this theme.

- Classes [at the university] provide invaluable knowledge and resources to better arm future teachers for effective careers in education…I hope to become the type of teacher that can make a difference in education by acting like the conductors described in Gloria's book. (Lexi, journal 1)
- I hope to become an educator that will have a positive intellectual and behavioral impact on my students. By reading the Ladson-Billings text I hope to improve my repertoire of skills to better influence my students toward this goal. (Brad, journal 1)

In the *Culturally Relevant Standards Based Teaching* (CRSBT) text, students provided evidence that they understood barriers exist between teachers who are White and students of color, but again framed their effectiveness as future teachers as an acquisition of skills that could be learned through coursework and trainings.

- I never thought about teaching as incorporating cultures into lessons. This is probably because I came from a predominantly White community and different cultures weren't apparent to me. I didn't start thinking about culture as something that separates people until recently. (Jessica, journal 1)
- I thought about how much teachers may or may not have gone through cultural competency training. (Emily, journal 2)

As students entered their field placements, the third text, *Mindsets in the Classroom* by Ricci was introduced and discussed in class concurrently with experiences in the field. Similar to the other texts, students wrote little that would evidence connections between critical consciousness, teacher identity and the readings. Only one journal spoke to a teacher's need for having a growth mindset as part of their teacher identity and even this writing was an overall observation of its importance rather than a more personal statement of adoption.

> Although it is important for students to have a growth mindset in order to reach education goals, it is equally as important for the teacher to have a growth mindset, as their students depend on them to be flexible in the teaching process. (Michelle, journal 4)

Texts and Limited Connections to the Field. Through the assigned Ladson-Billings and Saifer et al texts, journal reflections provided examples of students becoming aware of working with diverse student populations and a general consideration of culturally relevant pedagogies. However, the reflections were not connected to specific examples or experiences to the field that might demonstrate critical consciousness in seeing inequalities in schools or culturally relevant pedagogies as a response to oppressive systems. Reflecting on the *Dreamkeepers*, Katie wrote,

> From a teaching perspective, I have learned how to celebrate racial differences in the classroom and recognize the ways in which different learners experience success in different ways. I learned about connecting with each individual student, becoming active and involved in my students' communities and making a conscious effort to create lessons that connect to the cultural backgrounds of my future students. (Katie, journal 2)

Journals that discuss the Saifer text are similar and described general concepts around culturally relevant pedagogy and its implementation as a means of demonstrating care for students of color.

> When a teacher makes an effort to become more familiar with students' backgrounds, it shows that they care about students beyond just their performance in the classroom. (Katie, journal 3)

As students were placed in the field and began observations, the Ricci, *Mindsets in the Classroom* text was introduced. Student journals reflected stronger theory to practice connections with this text. Students wrote about seeing or not seeing evidence of growth mindset at their field placements and a commitment to build growth mindset curriculum into their current or future work as a teacher.

> After reading chapter three of Mindsets in the Classroom, I have tried to incorporate the students previous work into the next class. (Randy, journal 3)

Emily wrote that she did not always see flexible grouping at her field site and how that was in conflict with the pedagogies described in the text:

> One of the many important things I have learned [in the text] is the idea of flexible grouping. This is something that I have and have not seen at [my field site]. (Emily, journal 3)

Students wrote about a commitment to implementing growth mindset strategies in their classrooms. They also wrote about mindset development as something needed by both students and teachers. Critical consciousness requires a judgement that actions are both worthy and possible (Freire, 1994). The student reflections around growth mindset demonstrated that the experiences in the field influenced judgements that both they and their students needed to hold high expectations for student achievement. High expectations are an integral aspect of culturally relevant pedagogies (Ladson-Billings, 2009).

- I intend to open my first day of classes with a discussion of the growth mindset rather than merely mapping out the year for my students. This will surely have a

more positive impact on their education than knowing we will read *To Kill a Mockingbird* in October. (Jerry, journal 3)

- Although it is important for the student to have a growth mindset in order to reach education goals, it is equally as important for the teacher to have a growth mindset, as their students depend on them to be flexible in the teaching process. (Michelle, journal 4)

No Reflection on Specific Student Relationships. In previous studies (Schauer, 2015; Ladson-Billings, 2009; Emdin, 2016) it was a preservice teacher's relationship with students in the classroom and with their mentor teacher that best helped awaken critical consciousness and the implementation of culturally relevant pedagogies and practices. In the journals analyzed, there were no specific connections as evidenced in a preservice teacher-student relationship to either the Ladson-Billings or Saifer texts. Despite being placed in schools where over half of the students represented students of color and the texts emphasize the importance of building relationships with students, the journals did not mention one instance of a connection made to the texts as experienced through a relationship formed with a student. The Ricci text makes limited observations and those were for groups of students and not individual students as it related to the importance of growth mindset and observing students with predominantly fixed mindsets in classrooms observed. Similarly, course assignments were discussed broadly in terms of benefiting students as a whole, but specific examples were lacking in the journals.

Mentors Do Far More than Teach Content. Finally, students appeared to be in awe of the many tasks a mentor teacher needs to accomplish throughout the day such as taking attendance or facilitating student engagement in lessons. The journals do not reflect upon the perceived critical consciousness of their mentor teachers to see, judge or act on oppressive systems as experienced by students of color. After reading about numerous examples of outstanding teachers for African-American students as researched by Ladson-Billings, students did not write about the extent to which their mentor teachers exemplify or do not represent the teachers Ladson-Billings lifts up in her work. Similarly, students' journals did not link their mentor teachers with pedagogies learned in the *Culturally Relevant Standards Based Teaching* text. The Ricci text sparks some reflection around growth mindset and the extent to which mentor teachers exhibit fixed or growth mindsets, but those reflections were rare.

> My mentor teacher has a growth mindset. This is extremely evident in situations where she deals with difficult students or matters around the school. If there is a problem in her way she fixes it and adapts to the situation. (Michelle, journal 4)

Student journal reflections regarding mentor teachers represent a realization that teaching is "far more than just teaching content". Students reflect on the skills their mentor teachers have developed around pacing a lesson, being flexible with student learning needs and managing classroom tasks such as taking attendance while simultaneously managing student behavior and starting class on time. Overall, preservice students tended to express awe regarding the mechanics of being a teacher and did reflect deeply on teacher

pedagogies that may or may not be considered culturally relevant.

Discussion

The primary research question of this study examined ways that method course curriculum and associated field placements may foster the development of critical consciousness in preservice teacher candidates as evidenced in reflective journaling and related course assignments. The findings from this study point to significant mismatches between text selections, field placements and course sequencing for supporting the development of critical consciousness in preservice teachers These mismatches may be centered around the timing of texts with field placements and the number of field hours required to form meaningful student-teacher and mentor-preservice teacher relationships to support critical consciousness.

The student journals demonstrated an engagement with the assigned texts and an awareness of culturally relevant pedagogies and practices. It was hoped that reading the Ladson-Billings and Saifer et al. texts prior to placement in the field would provide preservice teachers with prior knowledge and examples of culturally relevant pedagogies and practices that could be readily observed and reflected upon once they began field hours. However, the journal data showed that students did not connect the texts to their observations in the field. Students largely discuss the texts and the field experiences in isolation from each other. In this way, culturally relevant pedagogies remain limited to skills to be learned rather than actions that stem from critical reflection and experiences in the field.

In future course design, it will be important to align the course texts with the commencement of field placements so students can read the Ladson-Billings and Saifer et al. texts and have better opportunities to critically explore the concepts discussed as they see or do not see them exemplified in the field. The journals reflections might show stronger evidence around critical consciousness if texts and experiences occurred simultaneously. This approach might better help students read about the teachers and students as described in the Ladson-Billings text and immediately spark reflection on the extent to which their assigned mentors and students experience oppressive systems and respond with culturally relevant pedagogies. To facilitate this alignment, it will be important to work closely with the office of field placement to identify potential placements for students in the field to begin closer to the second or third week of the semester, rather than week five or six. It will also be important to identity mentor teachers who implement culturally relevant pedagogies and practices in their classrooms. The inquiry letter to schools should explicitly state that the observation of culturally relevant practices is a desired outcome of the field experience.

Additionally, as the Ricci text on growth mindset is a concept that is broader and less confined to a specific demographic of student, it might be a better text to start the semester with and have students make connections to prior knowledge and experiences from their own K-12 experiences. The same texts, in better alignment with placements in the field,

could yield better opportunities for students to critically reflect on their teacher identity and the use of culturally relevant practices and pedagogies.

Additionally, the student journals did not produce significant moments of critical consciousness as experienced through relationships developed with their mentor teachers or students in the classroom. Research has demonstrated that strong relationships with mentor teachers and students of color can help awaken critical consciousness of preservice teachers (Schauer, 2015; Cochran-Smith, 2012; Emdin, 2016; Romano, 2008; Sleeter, 2012). Possible revisions for course design might include increasing the number of hours spent in the field so these relationships can have more time to develop. The journals may only touch on the surface of teaching, learning and critical consciousness development because preservice teachers did not have enough time in the semester to form relationships with their mentor teachers and the students in the classroom. The current requirement is to complete thirty hours of observation and teach two lessons. It would be interesting to analyze future journals that represented a longer placement in the field. Again, if students were placed closer to week two or three of the semester, they could increase total field hours to approximately forty total hours if the average was three hours per week in the field. These additional hours, along with the closer alignment of texts with field observations, could do more to awaken critical consciousness in student journal responses.

Implications

The findings from this study suggest the following course revisions for future action research:

1. Culturally relevant readings and class discussions should align with the commencement of field experiences so students can better connect texts to experiences and support the development of critical consciousness.
2. Class discussions and assignments require more intentional connections to field experiences, so students have opportunities to share experiences in the field in the class setting. All text-based discussions need to include opportunities for students to connect the readings to observed practice. This can be achieved with guided questions and focused discussion protocols.
3. Revisions to the journal assignment and other assignments are needed to make the development of critical consciousness a stated and desired outcome. Future iterations of the course will ask students to explicitly identify potential moments of critical consciousness that are sparked by texts, class assignments or field experiences. Students will be asked to reflect on ways they “see, judge and act” through their experiences with texts, course assignments and field experiences.
4. The total number of hours completed in field experience should increase from 30 to 40 hours. An increase of hours, along with earlier placements, might better support relationships with the mentor teachers and students at the field site. Placements should seek mentors that already implement culturally relevant pedagogies in their classrooms. Explicitly asking mentor teachers to share their rationale for the implementation of culturally relevant pedagogies could be helpful in the preservice teachers’ development of critical consciousness. Adding an assignment where

preservice teachers interview their mentor teacher and students in the classroom to listen to their lived experiences with schooling and pedagogy might support the development of critical consciousness for all involved.

Conclusion

As teacher preparation programs seek to prepare preservice teachers for work with students in diverse settings, it is important to think deeply about the curriculum and experiences that best prepare candidates for this work. The selection and inclusion of texts, assignments, and field experiences that allow students to explore their identities as teachers and the evidence-based methods of teaching and learning that are most effective for students of color is essential. It is hoped that teacher preparation programs intentionally include texts, assignments and field placements that address culturally relevant teacher identities and pedagogies. However, as the findings from this study highlight, intentionality goes deeper than simply choosing culturally relevant texts and placing students in classrooms with students of color.

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And Integrating Culturally Responsive Group Work in Schools to Foster the Development of Career Aspirations among Marginalized Youth. DOI: 10.1080/01933922.2020.1856255 Email: Tahani.Dari@utoledo.edu

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Appendix A: Course Performance Tasks

Teaching in the Field

Students will complete 30 hours in the field and submit signed documentation of hours at the end of the experience. Students will plan, teach and reflect on 2 lessons prepared for students in the field. These experiences will be assessed with the following checklist criteria: 1. All lesson plans and related instructional materials are uploaded and approved 48 hours prior to teaching the lesson 2. completed observation forms from the mentor teacher are uploaded and 3. lesson reflections are uploaded within 48 hours of teaching the lesson.

Journal Reflections

Students will complete 4 journal reflections by assigned dates in the semester. These reflections will include a demonstration of knowledge and skills learned in class, through assigned readings and in the field (once assigned to a site) as well as dispositional thinking toward becoming an effective teacher for students.

Initial Visual Representation of Middle/Secondary Schools:

Select a minimum of ten or more photos and/or visual representations from magazines, newspaper, or Internet sources to visually describe middle/high school education prior to your field experience. Display the photos on a poster board or electronically. Write a summary of what the photos represent. What influenced your decisions? How does poster relate to your personal experience while attending middle/high school? What aspects of your presentation influence your personal philosophy of teaching? At the end of the semester, you will revise your presentation.

Sample Lesson Plan

Students will work in subject area groups to design and teach a sample lesson to peers in the class.

Multi-Disciplinary Unit Plan

Students will work in multi-disciplinary groups to design and present a unit plan based on demographics and data provided by field sites. The performance task will include a unit plan, example of a performance task that would meet expectations, assessment criteria and a group presentation that details the process and products of the unit plan design assignment.

Mid-Term Presentation

Students will synthesize their learnings to respond to the needed knowledge, skills and dispositions required of an effective teacher based on experiences acquired through the course and related field experience. Each group will create an artifact of their learnings and share it though a 5-7 minute group presentation to the class. The artifact can take the form of a PowerPoint, video, drama, or poster/visual art.

Revised Visual Representation of Middle/Secondary Schools

Revise your initial visual representation of middle/high schools. Either remove photos or add photos to your board. Write a reflection of the changes. Cite specifically what has impacted your changes (experiences during the course, experiences at the school, etc)? How does your poster relate to your personal experience while attending K-12 school? What aspects of your poster influence your personal philosophy of teaching? How does this visual experience impact your decision to teach in a middle/high school setting? What changes, if any, has this experience had on you as a teaching professional?

Final Exam Project

Project includes a revised version on one lesson plan taught this semester, examples of student work produced during that lesson, an analysis of the students' work, and a 3-5 page paper explaining your rationale for revising the lesson.

Appendix B: Journal Rubric

	Approaching Expectations	Meets	Meets/Exceeds
Knowledge	Points Range: 0-4 Journal does not properly cite/connect (APA) relevant knowledge from the assigned readings and class discussions.	Points Range: 5 - 7 Journal cites/connects (APA) relevant knowledge from the assigned readings OR class discussions.	Points Range: 8 - 9 Journal cites/connects (APA) relevant knowledge from the assigned readings and class discussions. Exceeds: Cites sources outside of class/assigned readings
Skills	Points Range: 0-4 Journal entry does not or inconsistently demonstrates an ability to apply knowledge to application in the field through specific examples discussed in class or observations in the field.	Points Range: 5-7 Journal entry demonstrates an ability to apply knowledge to application in the field but does not cite specific examples discussed in class or observations in the field.	Points Range: 8-9 Journal entry demonstrates an ability to apply knowledge to application in the field through specific examples discussed in class or observations in the field. Exceeds: applies skills not discussed in class/readings from personal research.
Dispositions	Points Range: 0-4 Journal is late (more than 1 week) and/or does not demonstrate thoughtful reflection on becoming an effective teacher for students.	Points Range: 5-7 Journal is late but demonstrates thoughtful reflection on becoming an effective teacher for students.	Points Range: 8-9 Journal is completed on time and demonstrates thoughtful reflection on becoming an effective teacher for students.

BEYOND THE PERSONAL NARRATIVE: CHOICE AND AUTHENTICITY IN MIDDLE SCHOOL NOVEL WRITING

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Abstract Due to increasing weight on test scores and accountability, students rarely get the opportunity to participate in creative, authentic writing tasks in the language arts classroom. The purpose of this teacher action research study is to understand how middle school students' engagement, agency, and self-efficacy were affected when given agency, choice, and authenticity in a writing unit. The study collected qualitative data from a middle school novel-writing project to answer the questions: 1) how does providing choice and supporting student agency in an authentic writing task influence students' engagement in the writing process, and 2) how do middle school students develop their identities as writers when given choice and agency in an authentic writing task? When the student participants in this study were given choice and an authentic writing task, they showed increased self-efficacy and higher engagement in the writing process. The students used creative self-expression to represent their personal experiences, interests, and social worlds as they found their own identities as writers.

Keywords: teacher action research, agency, student choice, authentic writing, middle school, language arts, writing instruction

Introduction

"There's millions of voices in the world that need to be heard. They want to speak up, but they can't. They can't speak up because of the pressure of being the perfect person. That's why we have to let the voices be themselves and let them speak up" (excerpt from Amber's novel, The Kingdom).

Year after year, middle school teachers give students the same types of traditional writing assignments: expository essays (research papers, often on a topic dictated by the teacher), persuasive essays (with commonly suggested arguments such as whether schools should have uniforms or allow phones in class), and narrative essays (usually a personal narrative). I am no different; when I started teaching, I thought I was giving students creative choices when I told them they could write about anything in their lives. However, I got to a point in my teaching career where I could not take another "The Time I Rode a Rollercoaster" essay. And I was getting near that point with essays titled "My Birthday", "My Family Trip", and "The Day I Broke my Arm". We expect middle school students to read engaging, compelling,

and complex texts that represent their interests, personalities, and backgrounds. Shouldn't we expect the same of their writing?

As teachers, one of the challenges we face is how to implement writing assignments that not only meet school, district, and state requirements, but also inspire students to tap into the unique interests, creativity, and distinct abilities that each student possesses. In response to, and despite, all of these pressures and concerns, I designed a writing unit for my sixth-grade language arts students that required them to write their own novel in a month. My goal with this unit was to increase student engagement in the writing process, while effectively teaching them to use strategies and make decisions that "real" writers do. Although this had the potential to become an overwhelming task for those in their first year of middle school, all my students finished the unit with creative and unique narratives that they were proud to have written and were excited to share with their classmates, friends, and family.

As the students developed their novels, they used mentor texts, participated in writing workshops, and worked collaboratively in writers' groups. Using teacher observations, analysis of the students' finished novel excerpts, and an open-ended survey/reflection completed by the students at the end of the unit, this study seeks to examine the effects on student engagement, as well as how they developed their writing identities when given agency and choice. This study asks:

1. How does providing choice and supporting student agency in an authentic writing task influence students' engagement in the writing process?
2. How do middle school students develop their identities as writers when given choice and agency in an authentic writing task?

As I seek to answer these questions, I begin by examining the literature on authentic writing, student choice, and agency. Then I lay out the most relevant elements of the unit design and instructional methods. Finally, I will analyze the students' writing and reflections and discuss the implications of this study on future writing instruction.

Literature Review

This writing unit was designed to give students both authentic writing opportunities and choice during writing instruction. The concept of offering students choice and authentic writing opportunities during instruction are widely recognized as best practices that support students' learning (Fletcher & Portalupi, 2001). However, they can often prove to be quite difficult to put into practice in the typical classroom, especially in the current educational environment that focuses heavily on scores from standardized tests that do not allow any room for student choice or authentic writing tasks. Applebee and Langer (2006) observed that requirements of most state and district writing assessments expect students to respond to narrow prompts in limited genres, thus restricting the scope of authentic and meaningful writing students are asked to do in the writing classroom. Furthermore, students cannot easily develop their identity as writers within the rigid genres of traditional school writing

assignments, and they frequently adopt a negative attitude toward writing and their self-efficacy as writers (Williamson, 2019).

Authentic Writing. Students rarely can engage in authentic literacy activities. In a society that focuses on test scores as a sign of academic achievement, teachers often find themselves pressured to teach to the test. Reading passages assigned as part of the curriculum are designed to mimic those that would be found on a standardized test, and writing assignments are often designed with the standardized test grading rubrics in mind (Applebee & Langer, 2006). Despite studies that have suggested that students make gains in achievement when they are engaged with learning through authentic literacy activities (Behizadeh, 2014; Freire, 2018; Morrell, 2008; Winn & Johnson, 2011), many schools still disregard such activities in favor of more traditional "doing school rather than doing life" activities (Roll & Vaughn, 2019, p. 79).

According to Roll and Vaughn (2019), "authentic literacy opportunities highlight tasks and instruction that are connected to students' real lives, student-centered, open ended, involve choice, and may include a project-based approach" (p. 79). Authentic writing opportunities should have a specific, real audience and reflect writing that would happen in the real world, while still connecting in meaningful ways to the actual lives of the students engaged in the tasks.

Behizadeh (2014) posits the question, "*What* constitutes the real world and *who* decides if a school task such as an academic essay is authentic?" (p. 28). Considering that a student's own judgement of a writing task determines authenticity, Behizadeh suggests positioning the student as the authority when deciding what constitutes authentic writing (2014). As students bring their own personal interests, family and cultural experiences, and social life into authentic writing opportunities, they alone have the right to decide whether a writing task is connected to the world, and to their lived realities (Behizadeh, 2014, p. 29). Thus, authentic writing may look different from one student to another and may vary from classroom to classroom.

Student Choice. An essential part of fostering authenticity in writing instruction is providing students with choice in the classroom. Classroom choice is a widely recognized, research-based teaching practice in which texts, tasks and collaborative groups are determined by the students (Meier, 2015). When students are given choice in the classroom, they are more likely to be engaged and put more effort into an assignment (Parsons et al., 2015). Not only that, but choice increases self-efficacy, or confidence in the students' own abilities, and involves students in the learning process, giving the students a sense of ownership of their learning and writing (Ruben & Moll, 2013; Ryan & Deci, 2000; Nelson, 2019).
Allowing student choice in writing tasks, whether it be in purpose, genre, audience, or style, allows students to express their identities and form a more personal connection with their writing (Williamson, 2019). For middle grade students, writing can allow them to find meaning in their personal experiences, and to "explore their innermost thoughts, their struggles with identity, relationships, cancer, love, religion, and fears (Ruben & Moll, 2013, p. 12).

Student Agency and Writing Identity. Agency refers to the ability one has to act upon their world, and in turn is "the ability of students to give significance to the world in purposeful ways with the aim of creating, impacting, and/or transforming themselves, or the conditions of their lives" (Vaughn et al., 2020, p. 534). Fostering student agency in education is an important but often neglected aspect of writing instruction, as it allows students to develop as independent, confident writers (Vaughn et al., 2020, p. 534). Although agency is essential to students' growth as independent learners, the unfortunate truth is that most students, particularly students of color or with low socioeconomic status, do not have a sense of agency over their learning in a typical classroom setting.

Throughout their school experiences, students often find themselves positioned as certain types of readers and writers: low, high, struggling, advanced, among other labels students may be given because of testing, tracking, or other types of evaluating and grouping. Students have very little agency over the reading/writing identities ascribed to them institutionally and reinforced through classroom practices (Frankel & Fields, 2019). They do, however, have the agency to either work within the confines of their labels, or eschew them. Sadly, though, once a student has been identified in such a way, it is quite difficult to remove or change the label, especially when they feel they have little to no agency over their school and learning environments.

Closely tied to agency, identity is a complex and much contested term (Alvermann, 2001; Gee, 2000; Moje & Luke, 2009). For this article, I will focus on students' identities *as writers*, which is still a multifaceted concept. A students' writing identity "involves different positions or stances authors take up as they compose texts and engage in conversation, ... relationships authors form with others as they compose, and individuals' self-ascribed and externally imposed concepts of self-efficacy" (Williamson, 2019, p.252). Giving students choice and agency in their writing means encouraging students to bring their cultural, social, experiential backgrounds and varying literacy practices into their writing. Recognizing their cultural and social knowledge as an asset to a student's writing not only informs the stances they take and the voice they assume, but it also builds their self-efficacy, which could lead to a positive self-ascribed identity as a writer.

Methodology

Setting. This qualitative study took place during my fourth year of teaching in a middle school in a large, urban school district located in the Midwest. The school includes grades six through eight and has 987 students. Of the enrolled students, 86.7% qualify for free or reduced lunch.

The novel writing unit was implemented in my two sixth-grade advanced placement (AP) English language arts classes. I was not able to teach this unit in my regular Language Arts classes, as they were planned collaboratively in a professional learning community (PLC), leaving me very little autonomy to adjust content or instructional units. Unfortunately, the PLC planning sessions frequently resulted in the more traditional "doing school" type of

lessons, in response to administrative and standardized testing pressures; sadly, this is often the case across schools, especially when involving instruction geared towards "low" or "struggling" students (Finn, 2010). Given that I was the only teacher in the school teaching 6th grade AP Language Arts, I had more independence to design innovative and authentic instruction that aimed to provide students with more choice and student-centered, creative learning opportunities.

In the two 6th grade AP language arts classes, there were a total of 58 students; each class had 29 students, which was the maximum class size for a 6th grade classroom in the district. While many of the students had qualified for advanced placement through the district AP test, some students in the classes were chosen as "sit-ins" based on state test scores and teacher recommendations from previous years.

The Unit Design. The unit design incorporated several key literacy strategies, including the use of mentor texts, writing mini-lessons, and collaborative learning. As an inquiry-based writing unit, most of my writing instruction and student outcome expectations revolved around the question: What are the moves and strategies an author uses as they write a novel? Each class period was structured based on the writing workshop course design (Atwell, 2015; Fletcher & Portalupi, 2001). A typical day of class consisted of a mini-lesson, collaborative writer's group discussions, and writing time.

Mini-Lessons. Writing mini-lessons allow the teacher to present a strategy, technique, or procedure before then allowing the students to apply the learned strategies to their own writing. According to Atwell (2015), mini-lessons should be no more than ten to fifteen minutes; long enough to present an idea without losing the interest of the students.

Fletcher and Portalupi (2001) explained that there are four different categories into which the writing mini-lessons fall: procedural, writer's process, qualities of good writing, and editing skills. The procedural mini-lessons were used to guide students as they created accounts or navigated websites, practiced classroom procedures for using the class set of keyboards, and learned how to use features or format their word document, like finding the word count of their novel or double spacing. These procedural mini-lessons were just as important as those teaching writing strategies and editing skills because the students needed clear instructions and guidance as they navigated new technology, such as Google Drive, iPads, and USB keyboards.

For the other categories of mini-lessons, I presented strategies and technical skills that the students could use as they wrote their novels. To reinforce these new ideas and see how other authors use the writing strategies, the students often referred to their mentor texts for examples. At the beginning of the unit, the students had been asked to choose their favorite novels, or something they had read and enjoyed recently, as their mentor texts. These represented a variety of authors and genres and were used as an example and guide throughout the writing process. The mentor texts were essential to the mini-lessons, but they also extended beyond that and were an important part of each student's individual writing journey. Gallagher stressed that "mentor texts are most powerful when students

frequently revisit them throughout the writing process" (2014, p. 28). The students were also encouraged to share examples from their mentor texts with other students as they worked in their collaborative writers' groups.

Collaborative Writers' Groups. Throughout the unit, the students worked in groups of four or five students to support and encourage each other as they wrote their novels. With their collaborative writers' group members, they explored and discussed strategies of storytelling, world-building, and writing skills together. Each class meeting had designated time for the students to discuss their writing with their groups. Sometimes they were prompted to discuss questions or topics presented in the mini-lessons, but other times they shared parts of their novels and asked for advice and feedback from the members of their groups.

The writers' groups created a social aspect to writing, a task which is often perceived to be independent and solitary. By working together and sharing ideas, the students could build on each other's strengths and expand their ideas. As the students helped their peers, they also became the experts on novel writing, thus increasing their self-efficacy and agency. In addition, they provided a network of support and encouragement to each other as they wrote, which improved motivation and engagement.

Writing Time. For the last portion of the class period, the students engaged in writing time, in which they worked independently on writing their novels. During this time, the goal (unless otherwise specified later in the unit) was writing a first draft of their novels. The students were encouraged to turn off what we called their "inner editor" and just write. This portion of the class was where the students applied writing strategies and creative ideas to their own writing. They often referred to their mentor texts during writing time, as a tool to assist with genre, plot, style, or just to help generate ideas when they became stuck. In this case the mentor texts allowed the students to find their voices and build their confidence and productivity while writing (Newman, 2012).

During the students' writing time, I conferenced individually with students to check their progress, give feedback, and provide encouragement to keep writing. I kept notes from each student conference that I could refer to in our next conference. Conferencing with students is a key element of writing workshops (Atwell, 2015), and allows the students one-on-one personalized time with the teacher, which is often rare in large classes like these.

Data Collection. The majority of the qualitative data for this study were collected after completion of the novel writing unit. The primary data source for analysis consisted of the students' final writing products, their novel excerpts. These excerpts, selected by the students to represent their larger manuscript, went through the revision and editing process, and then were shared with their classmates. The second source of data consisted of student reflections; these were distributed in a digital, open-ended survey form, and were completed by the students at the end of the unit. According to Yancey (1998), the process of reflection allows students "to participate with us, not as objects of our study, but as *agents of their own learning*" (p.5). The reflection consisted of four open-ended questions:

1) Do you think this was a good learning experience? Why or why not?
2) How did your writing improve during this experience?
3) Do you think you were successful in writing a novel? Why or why not?
4) What could you or Ms. Deckard do differently next time to make the experience better?

Additional data sources included my observations of the classroom and notes taken during student conferences.

Data Analysis. The data analysis combined thematic analysis with discourse analysis techniques. Inductive, holistic thematic analysis was initially used to identify patterns in the students' novel excerpts (Miles, Huberman, & Saldaña, 2014). Focusing primarily on themes that supported my research questions, I began by identifying novel excerpts that were representative of the students' use of choice, agency, self-efficacy, and writing identity. Upon second look at the excerpts, I identified two salient themes that emerged: choice of genre and connections to students' social worlds. I repeated this thematic analysis with the reflection surveys, which were largely focused on students' engagement, self-efficacy, and perceived identities as writers.

In the next stage of analysis, I selected exemplary sections from the student writing samples, as well as thoughtful responses to the reflection survey. I felt that these texts represented the students' expressions of agency, self-efficacy, and positive development of writing identity. I conducted a closer analysis of each set of samples using discourse analysis techniques. Classroom discourse analysis examines how students use language, and how it reflects the context of use (Rymes, 2016). I considered the following questions in the discourse analysis of students' written narratives: 1) how and in what ways did the students express their unique writing identity, and 2) how did the students reflect on their engagement in writing during the unit?

Results

At the beginning of this unit, the students were given authority to make their own decisions about the genres and topics of their novels. While many were inspired by their mentor novels and favorite genres of fiction, some chose to use this writing activity to address social issues, writing novels based on situations and experiences from their own lives. The students' identities as writers were discernable through the topics and genres they chose, as they wrote about issues that were personally important to them and chose genres and writing styles that they enjoyed as readers.

Furthermore, the students' reflections on their writing and experiences throughout this unit were overwhelmingly positive. These responses indicated the students' engagement in their novel writing, as well as the self-efficacy students developed from writing their own novels. In the following examples and excerpts, students' names have been changed to pseudonyms to protect their identities.

Social Worlds. Lewison and Heffernan (2008) observed that when students used their personal stories to analyze and critique their social worlds, the writing "acted as a tool to disrupt students' naturalized ways of 'doing writing' ..., encouraging them to analyze and critique issues they described as important in their lives" (p. 436). Several students in the class chose to write about issues that had affected their lives, and issues that were connected to their personal and cultural experiences; these issues ranged from racism and mental health to first love and conflicts with friends.

During one of the first student writing conferences, Kara told me that she planned to write a novel for Black girls like her, so that they could read something inspiring and positive about people like themselves. She recognized that there are few novels with young black women as the protagonists and wanted to address that issue by writing one. Although her original genre and plot ideas changed throughout the process of writing, conferencing, and discussing her story in the writers' groups; she had a clear vision of the audience for her novel and showed a strong sense of her identity and agency as a writer. She ended up writing a suspense story about an obsessed friend-turned-stalker in a middle school. The characters in her story were modeled after herself and her friends, and the story was set in a middle school like her own.

Ben based his novel on a traumatic experience from his recent past. He wrote about a boy who was unwillingly "outed" as being gay in the fifth grade. Drawing from his own experience, he was able to articulate the embarrassment and discomfort of his character's situation, depicting the thoughts going through his head as he went through the day at school knowing his classmates had learned something very private about him. In writing on this topic and sharing with his classmates, Ben was able to assert his own identity as LGBTQ and gained authorship over his story. Through this topic, he was also critiquing issues such as sexual identity and bullying, which were relevant within his own social world. This excerpt from Ben's novel illustrates how he expressed his character's thoughts and feelings in the context of these social issues.

> "Later that day at lunch he ran into Connor and Brian said 'I know what you said. I thought we were friends, but I guess not anymore.' Connor had no response and went on with his day. People were calling Brian names like faggot or homo. But Brian didn't bother to say or do anything about it. Later that day, he ended up going down to the counselor to tell her everything that had happened. While he was talking to Mrs. Bonet, he was thinking, 'Great. Another person to know what no one was supposed to know'" (excerpt from Ben's novel, *Nobody Knows*).

In this excerpt Ben wrote about a day in his character's life, based on Ben's own experience, in which everything seemed out of the protagonist's control. In doing so, Ben was able to reclaim power through his writing as he addressed the very personal issues of sexual identity and bullying in middle school. Davies (2006) claimed, "as a sense of writing the self develops, a sense of possibility as an active agent in one's own life emerges" (p.227). Likewise, as Ben developed his voice and identity as a writer, he was also able to gain ownership of an unpleasant experience from his past.

Genre and Style. Not all students, however, based their novels on their social reality. Given the choice to pursue their own interests and identities as readers/writers, some students relied on mentor novels to delve into genre and style. Lana, who had been reading a series of fantasy novels in which the characters were cats, chose to write a novel based on that series. In the following excerpt, Lana showed an expert use of detail, character development, and dialogue, as she wrote within the genre of her choice.

> "Crowberry padded into camp, fur bristled, standing on end. His blue gaze darted around, alert, as if ready for a cat to attack him at any moment. I guess running in the forest, when the sun was setting, could do things to you.
> 'Crowberry! What happened? Where were you? You were supposed to be on a patrol, not hunting by yourself!' Nightwillow scolded her brother, stomping up to him, her cat brows furrowed with anger" (excerpt from Lana's novel, *Black Pelts*).

Using writing techniques practiced in the mini-lessons and demonstrated in her mentor novel, Lana was also able to develop her style and build a positive writing identity in her novel. The choice provided in this unit allowed Lana to write a novel that was authentic to her own interests, and reflected her social world, building off her identity as a reader. Choosing a genre that she was comfortable and familiar with allowed Lana to feel motivated and competent in her writing skills, a key to building self-efficacy in writing (Nelson, 2019; Ruben & Moll, 2013).

In another example of a novel influenced by genre, Rissa wrote a fantasy novel inspired by the very popular vampire genre. Referencing her mentor text, as well as other popular young adult novels, she was able to develop her use of description and tone to build suspense and mystery, as is often seen in this genre.

> "The bat flew in through the closed window, passing through the glass like light. It was so darkly colored that it was almost imperceptible. Luna only noticed it when it flew in front of the star clock, blocking the faint gleam radiating from the timepiece. Light was blocked by the black void of the bat's fur. The sudden dark spot appeared in the corner of Luna's vision. She reached out to feel for the item obstructing the view of the clock. Her fingertips brushed the coat of the bat. The feeling was soft, but harsh. Luna didn't know how the sensation was even possible. The magic feeling filled her with cold and peace and a sense of belonging, and she didn't move her hand until the bat rushed up to her face" (excerpt from Rissa's novel, *A Fall with Fate*).

Not only did Rissa reflect her interests and reading preferences in her writing, but she also created a character who mirrored herself in many ways. During the reading conferences, several students, including Rissa, explained that they had based the main characters of their novels on themselves. McCarthy and Moje (2002) claim that "readers and writers can come to understand themselves in particular ways as a result of a literate engagement" (p. 229). Using first-person point of view, dialogue, and physical description, Rissa wrote into existence a character much like herself, who is facing struggles of self-acceptance and a

desire to "belong" (in this case through a supernatural gift), feelings that sixth grade students often grapple with.

Engagement and Self-Efficacy. Analysis of the students' novel excerpts showed how the students' engaged in the agency of self-expression and the development of their positive and authentic identities as writers. Next, I turn to the students' reflections on their novel writing experience to look more closely at their perceptions of their success as writers during this unit. There were three main themes apparent in the students' reflections: engagement, self-efficacy, and writing identities.

Some students commented not only on their own writing, but also on the overall engagement of the class towards the novel-writing project.

- "A lot of kids were excited over it. People would come in happy to write. Once everyone was finished, they felt as if they were a writer."
- "Every time I was writing I came up with more ideas. This was very exciting to keep writing and getting to our goal."
- "I feel that I was successful in writing my novel because it made me happy while I was writing it, so that's always a plus."

Self-efficacy and engagement appear to go together, based on these students' comments. The second comment reflects the engagement the student experienced while writing, as she kept coming up with more ideas. This comment also indicates the self-efficacy gained as the students were "getting to our goal". Through observations, I observed how the students' engagement in writing their novels was influenced by their confidence in their writing abilities. Moreover, as the students were "excited" about the unit, engaging in the process of setting a goal and meeting it, they were also building their own perceptions of themselves as capable writers.

The following students' responses also indicated increased self-efficacy and development of their identities as writers, as they described their perceptions of how they had grown as writers.

- "It was a good learning experience because I was able to try out new things in my writing to improve what I already knew. It taught me the magic of add[ing] lots of detail for almost everything, like surroundings and people around the main character."
- "I improved because that was the most I ever wrote"
- "It really made me think like a real author…"

In response to the agency and choice afforded in this unit, the first student was able to "try out new things" with their writing, a freedom that traditional writing units rarely grant. The "magic" of adding detail was one strategy they felt had elevated their writing. A goal of this unit was to "think like an author", using strategies and writing techniques that are used by authors of the students' favorite novels. In doing so, the young novelists gained confidence and began to see themselves as "real authors".

Discussion

While teaching this novel writing unit, I often found myself spending more time than the five or ten minutes which had been originally planned on direct instruction during the mini-lessons; this was usually due to overplanning the mini-lessons, but also resulted from my desire to follow up completely on all students' questions and comments. My tendency to go over the planned time was not a response to the students' learning and engagement, but more of a teaching habit I needed to overcome to move towards more authentic and student-guided learning. During direct instruction, a teacher has control over the classroom and the content of the learning. Naturally, this is more comfortable for many teachers, but as studies have shown, allowing for more choice and student-centered learning can increase engagement and self-efficacy (Behizadeh, 2014; Meier, 2015). Several students commented in their reflections that they wished they had been given more time for the collaborative writing groups, and much more time for writing.

As far as engagement and motivation, especially in writing, every class seems to have students who need a little extra encouragement and nudging towards task completion. Although the student choice and agency involved in this unit increased overall engagement and motivation, my classes were no exception to the rule. I conferenced with all students throughout their novel writing journey, but I attempted to meet more frequently with those who were not making the same progress towards their goal as their peers. I also helped those students by assigning them to groups with highly motivated and helpful students. Due to my specific teaching circumstances, this unit of instruction and study were restricted to AP classes. As is often the case in public schools, the AP classes do not fully reflect the diversity of the school and district. This unit, however, could be adapted for instruction of students of all levels and abilities. Allowing the students to set their own writing goals, based on their level and ability is one way to make the task more attainable for younger students and those who have been labeled as struggling writers. The unit provides an authentic, student-centered writing option that defies the rigidity of traditional writing instruction.

Conclusion

Students' motivation and engagement are often tied to their achievement. To increase student engagement and motivation in writing, authentic writing opportunities and student choice should be available to students throughout their classroom experiences. Unfortunately, due to pressure from districts and administrators to improve test scores, many teachers feel discouraged from incorporating innovative teaching practices and providing tasks that are truly authentic to students, such as the novel writing project described in this article. This is despite the fact that increasing student engagement can lead to long term improvements in test scores (Gunuc, 2014). As Behizadeh argues, the academic community "needs to support teachers in establishing authenticity as a shared goal with students, utilizing flexible pedagogies that honor students' funds of knowledge while providing choice and opportunities for expression and impact" (2014, p. 40). In doing so, we

can best prepare our students to write effectively and confidently about topics that matter to them.

About the Author

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REFRESHING READING LESSONS WITH A STRATEGY: STRUCTURED NOTE-TAKING WITH GRAPHIC ORGANIZERS

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Abstract Reading and comprehending a text from various dimensions have always required attentiveness and interest. Structured note-taking strategies with graphic organizers can engage students as active learners interested in the class material (Robinson, 2018). This action research study was designed to integrate structured note-taking strategies with graphic organizers into reading lessons to understand students' perceptions towards using such strategies. The strategies used were Cornell Notes, Split-Page, Fishbone Diagram, Highlighting/Underlining-Summary. The data was collected through pre- and post-reflections, focus group interviews with university students, the examination on students' worksheets, and supplementary tests to measure their reading comprehension. As pre-reflection shaped the further cycles of this action research, the data analysis with open and axial coding revealed several themes out of the post-reflections. These university students perceived these four strategies as both advantageous and disadvantageous. However, post-reflections demonstrated that positive views were higher than negative ones. The worksheets also revealed that Cornell Notes was the most preferred strategy, followed by Highlighting/Underlining-Summary.

Keywords: teacher action research, postsecondary level, structured note-taking, graphic organizers, reflection

Introduction

Many texts to read, comprehend, and analyze bear some difficulties for students and instructors in reading-related lessons. We, instructors, always want our students to exercise the most out of the text. However, as the primary participants in this desire, students can quickly lose their interest in the text and experience comprehension problems, which become a hot topic to overcome during our class hours. Comprehension in reading texts can be scaffolded with note-taking strategies (Rahmani & Sadeghi, 2011). However, note-taking strategies are mostly associated with listening and lecture notes (Sakta, 1992). Despite such a widespread conception, structured note-taking accompanied with graphic organizers can support the reading-based lessons. Students can benefit from the note-taking process with the help of graphic organizers while reading a particular reading text (Robinson, 2018). By utilizing structured note-taking strategies accompanied with graphic organizers, it is hoped

that university students' engagement and comprehension can be stimulated in reading lessons. The following research questions led the study:

a. What are the students' perceptions towards structured note-taking strategies with the accompanying graphic organizers in reading lessons?
b. How do the students perceive the benefits of structured note-taking with the accompanying graphic organizers for reading comprehension?

Literature Review

Theoretical Framework. Note-taking promotes enhanced attention, more sophisticated understanding, and stronger information storage (Kiewra, 1989). Note-taking has also been found to serve two functions as encoding and storage (Di Vesta & Gray, 1972; Kiewra, 1989). For the encoding function, note-taking has been associated with the encoding specificity theory (Kiewra, 1987). In this theory, the principle is "only that can be retrieved that has been stored and how it can be retrieved depends on how it is stored" (Tulving & Thomson, 1973, p. 359). In my study, the students stored knowledge from a reading passage with the help of structured note-taking strategies and graphic organizers so that they could retrieve it for the comprehension questions. As the theory holds, the way the knowledge is stored determines its retrieval. Therefore, it was anticipated that they would retrieve the knowledge as the cues written on these graphic organizers that they have filled out.

Reading Comprehension and Vocabulary. As an interactive mental process, reading comprehension is perceived to be the interplay of linguistic knowledge, background knowledge, and content knowledge of a student (Rahmani & Sadeghi, 2011). The roles of these knowledge types vary in reading comprehension. For instance, background knowledge can facilitate reading comprehension in a way that students can activate their prior knowledge in relation to the class material (Nunan, 2003). Vocabulary also bears importance for reading comprehension because it has been regarded as one of the most crucial components of the language learning process as generating the basis for language-related skills (Richard & Rodgers, 2001). Also, as foreign language input, vocabulary knowledge in English has been found to be impactful on reading comprehension (Chavangklang et al., 2019; Kameli & Baki, 2013; Manihuruk, 2020; Rahman & Iqbal, 2019). As Sternberg (1987) emphasizes, "one's level of vocabulary is highly predictive, if not deterministic, of one's level of reading comprehension" (p. 90). With all these intertwined aspects of reading comprehension, students might feel disoriented and unable to process a text strategically in a foreign language. In other words, they could struggle with the reading text instead of applying an appropriate strategy to ease comprehension. Even in some cases where they possess a strategy, as Gersten et al. (2001) mentions, they might be still unaware of the time to utilize it.

Note-Taking and Graphic Organizers. Note-taking has been accepted as one of the most relevant cognitive strategies utilized by language learners (White, 1996). Note-taking strategies have been studied in relation to various aspects such as achievement, development, or perception (Açıkgöz & Çetingöz, 2009; Yang & Lin, 2015; Haghverdi et al., 2010). Açıkgöz & Çetingöz (2009) indicated in their experimental design study that note-

taking strategies influence subject achievement and retention. On literacy development in English, Yang & Lin (2015) found online collaborative note-taking strategies facilitative. By collecting data through questionnaires, Haghverdi et al. (2010) demonstrated positive perspectives towards note-taking strategies among professors and university students. According to Castelló & Monereo (2005), note-taking has been studied as a research area in terms of its impacts on cognitive variables, on learning which changes with the quality of the notes, and on the classroom during the note-taking instruction. The research on the classroom defined as the way to report the functions and sense attributed to notes reveals the perspectives of teachers and students about note-taking.

The literature also provides studies concerning note-taking strategies and listening comprehension (Khavazi et al., 2018), note-taking strategy training, and listening test scores (Kim, 2019), graphic note-taking and learning (Robinson et al., 2006). For instance, Robinson et al. (2006) conducted a study designed with three quasi- and one real experiment to investigate the influence of teaching graphic note-taking. Partial graphic organizers which enable students to fill out some missing information through a computer were found to be effective in learning course content. Besides, in Dunkel's (1988) study where the lecture notes of L1 and L2 students were analyzed with stepwise multiple regression, the organizational devices were accentuated as components leading students to take efficient notes.

As mentioned in the theoretical framework and the studies above, note-taking grabs attention and assist the encoding process of a reading passage. In this encoding process, note-taking strategies can be structured with the help of graphic organizers. As Robinson & Kiewra's (1995) study indicated, graphic organizers help college students comprehend more "hierarchical and coordinate relations," and these students were found to be more accomplished in the application of this knowledge (p. 455). Graphic organizers also help the reader to clarify the knowledge, reinforce the learning, and integrate the new knowledge into old schemata (Ciascai, 2009). Besides, research studies with graphic organizers for reading comprehension can be found in various age groups and purposes (Agnello et al., 1998; Lopez & Campoverde, 2018; Pang, 2013; Olson, 2014).

In this action research, note-taking strategies structured with graphic organizers were utilized to promote reading comprehension since note-taking strategies can assist learners to "skim, scan, recognize relevant information, identify and select main ideas and supporting details, summarize, paraphrase, cite sources, extract information, evaluate information and results" (Kay Logan, 2003, p. 45). In contrast to the studies which were carried out in experimental conditions, this action research study basically aimed to reveal what kind of functions and sense the students attribute to these strategies which are Cornell Method, Split-Page, Fishbone Diagram, and Highlighting/Underlining-Summary.

Cornell Notes. Cornell Notes method was created by Walter Pauk at Cornell University. In this method, there are three significant parts. Keywords and questions are written in the left column as cues, while main notes, drawings, and other insights are put in the right column. A summary part, which is 2-3 sentences long, is written underneath. This strategy is

regarded as "a great way for students to learn actively, access higher-order thinking skills, and systematically review notes" (Robinson, 2018, p. 24).

Split-page. Split-page is a simple graphic organizer that enables students to see information on two columns or more in sequential order. A line is drawn on a piece of paper nearly 2 to 3 cm from the left margin. One column is reserved for keywords, main ideas, names etc. while the other is kept for supporting details.

Fishbone Diagram. Fishbone Diagram was first designed by Kaoru Ishikawa to illustrate cause and effect relationship in industrial expansion and quality control (Ishikawa, 1985). Since then, this organizer has been preferred for quality assurance purposes and as a problem-solving tool. The fish's head represents the effect, whereas the bones on its skeleton represent the causes.

Highlighting/Underlining-Summary. As a subtype of note-taking, White (1996) defines highlighting or underlining as a procedure utilized to “select information or parts of the target language in relation to comprehension monitoring” (p. 96). It also possesses an encoding function; students can use this strategy to concentrate on the parts of a reading passage or point out the crucial details in that respect (White, 1996). This strategy is supplemented by a summary because it can increase long-term recall as a higher-level strategy for comprehension (Khavazi et al., 2018).

Methodology

Research Context. This action research study took place in an English classroom of the English preparatory program at TOBB University of Economics and Technology in Ankara, Turkey. In this preparatory program, English is taught to students to be successful at the university departments. At these departments, 30% of the courses are covered in English. For the departments except three, students are required to show their English proficiency in their first year of the university. The first step is the English level identifying exam. This exam consists of grammar-vocabulary (60 questions), reading comprehension (40 questions), and listening comprehension (25 questions). When students pass it successfully, they take the TOEFL ITP proficiency exam (Listening Comprehension-50 questions, Grammar, and Vocabulary- 40 questions, Reading comprehension- 50 questions). The lowest point that should be received is 500 out of 677. Below the point 500, students cannot start their departmental courses. In the preparatory program, there are four levels, which are AF (beginner), A (elementary), B (pre-intermediate), C (intermediate). After an unsuccessful semester, a student can be in a repeat class as well (A repeat, B repeat, and C repeat). There are three semesters: fall, spring, and summer. In every level, three types of lessons are conducted: Main Course, Reading & Writing, Listening & Speaking. Besides two specific skills lessons, Main Course includes four skills with an emphasis on grammar instruction and vocabulary acquisition. Each semester, course levels end with TOEFL ITP. However, for students to enter TOEFL ITP at the end of the semester, some benchmark points must be collected out of portfolios, classroom performance grades, and semester-

long exams such as listening, speaking, and writing quizzes, reader exams, and three midterms.

During this study, as a Main Course teacher of a B (intermediate) level class, I was supposed to teach English grammar and skills with a textbook's help, *Pathways 2*. In the textbook, we were supposed to cover two reading texts with some comprehension questions every week. Reading sections are very crucial for students to improve their English knowledge and obtain sufficient grades for midterms and TOEFL ITP. However, in the lessons, I realized their unwillingness and loss of concentration. To stimulate reading lessons and enable them to improve themselves more, I integrated structured note-taking strategies with graphic organizers into five reading classes.

Participants. The participants were seventeen university students attending my English as a foreign language class which focused on grammar and language skills such as reading. There were eight female and nine male students. These 18-19-year-old students were selected with convenient sampling. The class demographics were very homogenous, as all of the students were Turkish. Students were told about the study and gave their consent to be involved. The study started in the middle of the semester and lasted until the end, in total for six weeks.

Research Design. This action research study utilized a reflective inquiry method with a pre/post design, and it lasted for six weeks in a university classroom. Two types of qualitative and one type of quantitative data were collected from university students. The first one was the written pre-and post- reflective inquiries on strategies. In pre-reflection, three questions were asked to the students: "What is difficult for you in reading?", "Do you have any strategies?" "How do you think you can improve your reading in English?". These questions were asked to realize what strategies have been actively employed by my students. After pre-reflection, the stage of explaining four structured note-taking strategies with graphic organizers began as one of the main objectives in this action research was to teach students some strategies to apply for reading a text in English.

As a first strategy, Cornell Notes were explained with the help of two videos (Learning Strategies Center Cornell, 2019), (Mometrix Test Preparation, 2015). After the results of pre-reflection, I added an option to write unknown vocabulary into the section on the left side *(Figure 1)*. Before seventeen students studied in groups on the reading texts about famous business icons, *Figure 1* was drawn on the board, and each part was explained.

Name, Topic, Date etc.	
Unknown Vocabulary, Keywords (Cues)	Main Notes, Sketches

Summary

Figure 1: Cornell Notes

The second strategy, Split-page, was modified with a horizontal split instead of a vertical one to accommodate enough space for three texts at the same time. Reading texts on three superstructures were assigned to groups, and the graphic organizer in *Figure 2* was drawn on the board for Transatlantic Tunnel, Sahara Solar Farm, and the Belo Monte Dam. The part for supporting ideas was modified as a comment part. For the Comments part, two guiding questions were given to the students: "How did you find the constructions?" "Are there any problem areas?".

The Most Important Points	The Most Important Points	The Most Important Points
Comments	Comments	Comments

Figure 2: Split-page

Thirdly, Fishbone Diagram was taught with an argumentative text which is about the payment done for music and the arguments of an Artist, a Producer, and a Downloader. In pairs, students were supposed to write on two bones why each person thought in this way. The effect was interpreted by the pairs and written on the head of the fish. The Alberta Teachers' Association's (2006) Fishbone Diagram was used in my lesson with some edition *(Figure 3).*

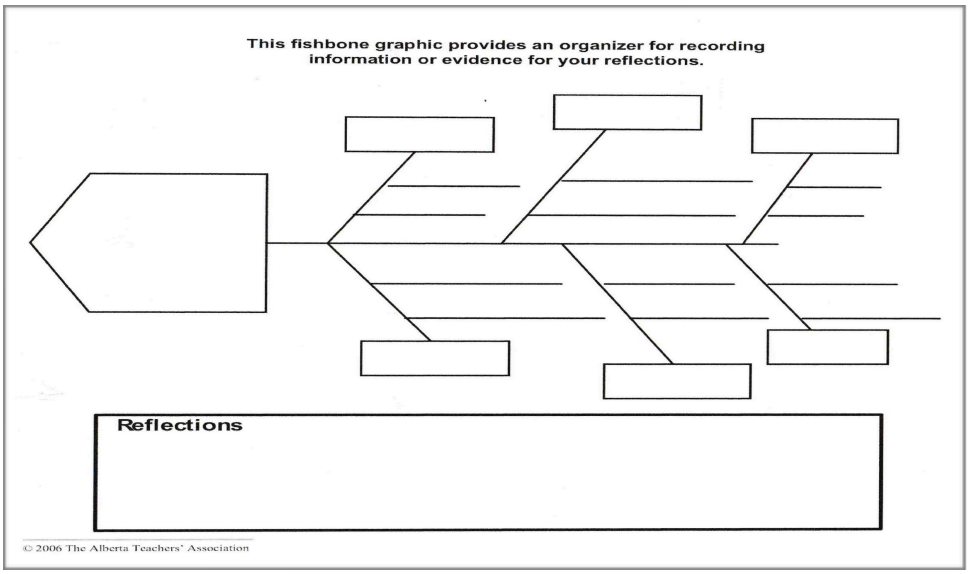

Figure 3: Fishbone Diagram
Source: The Alberta Teachers' Association (2006)

In the first interview, students suggested another strategy that is underlining. I combined highlighting/underlining with summarizing and gave them a choice about underlining, in which they can use highlighting as well. Despite the other structured note-taking strategies, this strategy was handled without any graphic organizer. As a first step, they studied summarizing. Three texts about famous recluses such as J. D. Salinger were assigned to groups. With six guiding questions, they outlined the text. As a second step, highlighting/underlining was explained as selecting keywords, phrases, vocabulary, and ideas central to understanding the reading text. Some instructions were written on the board, such as "read through the section," "reread and begin to highlight main ideas," "highlight or underline only the key vocabulary," "with the underlined parts, summarize what you read in 10-15 sentences". Afterwards, the strategy of Highlighting/Underlining-Summary was applied for the reading text about a foreign correspondent's life.

After the strategies introduced, I collected post-reflections from students. Strategies were drawn on the board as a reminder. In the post-reflection part, three questions were asked to the students: "Which method/strategy did you like most?", "Why did you like it most?" "How do you think it has helped your reading?". On a piece of paper having all four strategies with graphic organizers, they were also asked to select one strategy that they favored the most. Each student preferred one of them and filled out the organizer after reading the text about a cash depot's raid in Sweden.

The second data collection tool was three focus group interviews made to reveal students' specific thoughts on each strategy. Focus group interviews provide participants with opportunities for reflection (Denscombe, 2010; Dilshad & Latif, 2013); therefore, three focus

group interviews were conducted with students who attended to my office hour. These same five questions were asked in the interviews: "What are your thoughts about the strategy?" (Warm-up question); “What are the advantages of this method?”; "What kind of disadvantages does this method have?”; "Can this method be helpful in reading?" (Main questions). While all four strategies with graphic organizers were being discussed, questions were asked in the native tongue for them to express themselves more freely.

Lastly, supplementary quantitative data was collected from pre-and post-tests to examine my students’ development in reading comprehension. TOEFL type reading comprehension tests with six questions were carried out with two academical reading passages of *Pathways 2* book: “Young Chimp Outscores College Students in Memory Test” and “Aquatic Invasive Species”. The pre-test was applied in the first week while my students took the post-test in the last week of action research.

Data Analysis. The qualitative data were analyzed using open and axial coding (Creswell, 2013). Reflections and focus group interviews were separately coded. These comments were grouped together to obtain themes. In addition to coding, negative and positive comments were combined to demonstrate two sides of the students' reflections. As pre-reflections were given in paragraphs, post-reflections were turned into a table with all the answers to show the composite picture. The quantitative data were analyzed with SPSS Statistics 25.

Results

Pre-reflection Data. The answers to the three questions were examined to determine if these university students knew why reading was difficult for them, if they recognized using any reading strategies to help them in reading, and if they were willing to improve their reading in English.

The most frequent difficulty they faced was about vocabulary. In their answers to the first question, they complained about unknown words and their inadequate vocabulary knowledge. Several comments from my students were as follows:

- "I can't guess the unknown words' meaning from the sentences."
- "I can't understand the context."
- "I can't understand the complex sentences."
- "I can't translate the whole paragraph."
- "I get upset when the number of words I don't know is high."

For the question two, the students were asked to list the strategies they used while reading. The students listed six strategies: reading the first sentence, using keywords, making a prediction, scanning, skimming, and reading the whole for the main idea. However, surprisingly ten students did not list any strategies.

The last question revealed their own tendencies to improve their reading skill. Reading news in English, memorizing new words, reading more intriguing topics in English, reading articles

on the internet, or reading English books were some. With this question, it was anticipated that students could realize the initial steps to improve their reading skill. One student's reflection below indicates such realization *(Figure 4).*

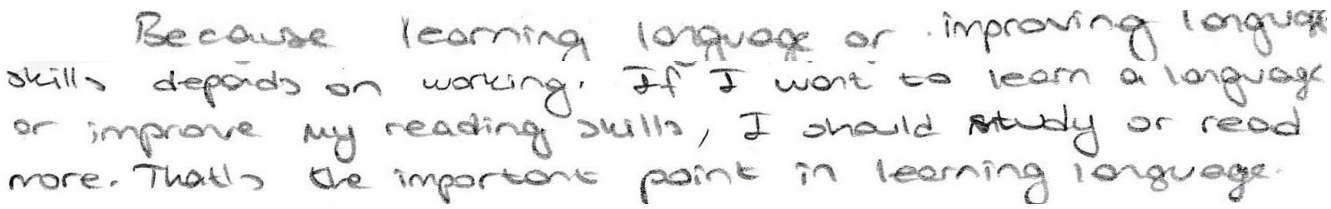
Because learning language or improving language skills depends on working. If I want to learn a language or improve my reading skills, I should study or read more. That's the important point in learning language.

Figure 4: A Student Response for the Ways to Improve Herself

Focus Group Interviews. Three focus group interviews generated three themes about structured note-taking strategies with graphic organizers: the advantages, the disadvantages, the time wasted.

The Advantages: Strategies can benefit students in various ways. In the focus group interview about Cornell Notes, its being systematic and in order was perceived to be advantageous. It was mentioned that three parts on the organizer could demonstrate the information neatly. A graphic organizer can also provide a visual to see all the information at the same time. One of my students commented that "because everything is on the same paper, we can glimpse very easily." Focusing on the text to make notes can be another advantage. One of my students said in the interview that "to make notes, we focused and read more carefully." Instead of reading superficially, some students absorbed more from the reading texts.

Interestingly students in the second focus group interview have diverse views on Split-page and Fishbone Diagram. Some of them commented that both are useful, while some thought one is better than the other. The students who found both functional were not sure about the superior one: "So both would be useful. I don't know which one is more useful." For reviewing purposes, both were seen as useful to comprehend deeply. One student commented by saying, "when we go back, these two would help better for us to comprehend."

For Highlighting/Underlining - Summary, the best advantage was said to be the summary part. As a pervasive note-taking strategy, summary enables students to comprehend the text in-depth and make an explanatory shorter version of the original text. The reflection done by one of my students can illustrate the same: "We wrote down the best points in the summary, which was good." The advantages were regarded as being systematic, focusing on the text and in-depth comprehension, being functional for reviewing.

The Disadvantages: In Cornell Notes, every detail might not be integrated into the organizer. "There is no detail" was one of the comments given. Besides, some students were very into fulfilling the organizer. They complained by saying the following: "While thinking over its making, we forget about the text." When I introduced the strategies with organizers, they commented that it is not a high-level one. Some found it useful only when they were

supposed to make notes of the essential points. For some students, reading comprehension was not associated with the strategy.

My students were aiming to pass TOEFL as soon as possible. For that reason, they always made a connection between the materials/strategies and the TOEFL test. About Split-Page, one student commented that "during the exams, we probably cannot do such things. Because it wastes our time." The disadvantages were regarded as fewer details, too much concentration on the making, irrelevance to exam preparation.

The Time Wasted: For each strategy with graphic organizers, a common complaint was made: "It is kind of wasting our time." My students were mostly concerned with the TOEFL test. Fishbone Diagram, Cornell Notes, Split-page were seen as strategies wasting the time of the students. Underlining, which was integrated after their suggestion, was seen more positive in this regard: "Today's was better. We underlined etc. The loss of time was less."

Post-Reflection Data: In post-reflection, two views got apparent: positive versus negative. The reflections gathered with the questions about improvement and likes/dislikes were arranged with a table. The symbols of + (positive), — (negative), +/— (unsure) in this table indicate these views extracted from post-reflections *(Table 1).* What my students liked differed. For Cornell Notes, tidiness, simplicity; for Split-page, easiness; for Fishbone Diagram, being visual; for Highlighting/Underlining-Summary, saving time were some points liked.

In a worksheet with four strategies, students were given a chance to choose one strategy with a reading text. Most of them chose Cornell Notes out of the four structured note-taking strategies with graphic organizers; therefore, Cornell Notes was evidently the most preferred one. The second one which was chosen the most was Highlighting/Underlining-Summary. Some example worksheets can be found in *Appendix A*.

Table 1: Post-Reflection - Responses

Strategies	**What they liked**	**What improved**
Cornell Notes	Main ideas and vocabularies making summarizing easy	"It helped. It made me see things better in a text." (+)
	Tidiness on a paper	"It is a classic method. Sometimes it is useless, sometimes useful." (+/—)
	Simplicity	"It didn't help me." (—)
	Being regulatory and explanatory	"It is not necessary." (—)
	Detailed than others	"It could be helpful, but we should practice." (+)

	Good for mastering the subject	"I haven't used it yet". (—)
Split-page	Being easier than others	"Yes, it helped me." (+)
	Its being basic	"It didn't improve, no use for texts we see, maybe we will use in the future." (—)
	Easiness	"I don't use." "It didn't improve." (—)
Fishbone Diagram	Showing only main words Being easier than others No unnecessary sentences	—No comment was given for this part
	Being visual	"It helps me to read, but it is a long method." (+)
	Less effort to apply Focusing more on the text Useful to summarize the text Highlighting important points more	"It absolutely helped me to improve my reading skill." (+)
Highlighting/Underlining - Summary	Summarizing the text with our words and sentences Understanding the text best	"This strategy helped my reading skill." (+)
	The most practical method Summarizing in a short time	"I don't know." (+/—)
	No need to write again Not a waste of time	"It helps my reading skill." (+)
	Saving time Being useful	—No comment was given for this part
	Better for the texts given to be read in a short time	—No comment was given for this part

Supplementary Quantitative Data. Students were given two TOEFL like tests as pre-and post-tests. A pair sampled T-test revealed that there was a significant difference between pre-test (M=2.00, SD=1.27) and post-test (M=4.06, SD=1.08), t(16)= -8.78, p<.001. The scores increased significantly between two times of testing. Even if the result wasn't influenced only by the strategies, it demonstrated me to trust steady improvement and to continue to study with them over reading skills.

Discussion

In this action research, it was learned that it is essential to collect reflections from students as these reflections give the students a voice and a way to talk about their thoughts. I learned about their problems, their strategies, or those who haven't possessed any strategies as pre-reflection illustrated. In the first place, most of the students were not aware of any strategies to be used, as Gersten et al. (2001) stated. With pre-reflection, students also thought over the possible ways to improve themselves by reflecting on their own tendencies. The last point that pre-reflection contributed to my understanding was my students' problems with unknown words. I revised one section of Cornell Notes accordingly, which could help reading comprehension. Besides, the data from the focus group interviews allowed me to hear the students' suggestions. With respect to their suggestion, a new strategy called Highlighting/Underlining-Summary was added. Five students favored this strategy. Providing variety also increased familiarity with different options.

The research questions were investigated with focus group interviews and written post-reflections. The students' perceptions towards structured note-taking strategies with the accompanying graphic organizers had two directions: positive and negative. After the introduction of all these strategies and organizers, different views appeared for each strategy. For instance, some students found Cornell Notes systematic, whereas some students criticized it for fewer details. I observed the same in post-reflections. One student said that his favorite strategy helped him to improve his reading skill. On the other hand, another student found the strategy unnecessary. In line with Castelló & Monereo's (2005) classification, this research about classroom provided me with senses and functions my students attached to notes. Their perceptions varied; therefore, I believe instructors should not limit the number of strategies they teach. All students do not prefer the same strategies. After our instructions, they can pick the strategies that work best for them. The students willing to integrate these strategies with reading texts can be competent if we teach them the strategies with an activity-based approach.

The benefits of structured note-taking with the accompanying graphic organizers for reading comprehension were assessed in relation to their TOEFL exam, which they must take to start their departmental courses. Some students regarded these strategies as irrelevant to their TOEFL exam. Students' perception of exams and their constant search for relevance in every activity is a serious problem for teaching. In this way, the students miss the core values of learning. I care about the activities aimed outside the exams' realm even if students' reactions sometimes are not very cooperative. Because as instructors, we know what benefits more for now and for the future. In post-reflection, one of my students

commented that she didn't see any use for the texts we have covered now, but these strategies could be used in the future. I believe my students can use these strategies in their departmental courses easily. For some students who find it irrelevant, this irrelevance can turn into relevance in their departmental courses. I believe teaching is not about the moment only. If we can influence the future, that's a learning outcome as well.

As the last data set, pre-and post-test results revealed that the rate of their correct answers in a test measuring reading comprehension increased. It was the result of their enhanced reading comprehension skill. However, I should acknowledge that the strategies could not be the only factor for such a result. It is highly possible that there are various confounding factors in this measurement. Nevertheless, the improvement in their reading comprehension skill was a crucial outcome.

Implications

This same research design can be adopted beyond my teaching context. In the university/college context, there are many departmental courses. In these departmental courses, students are assigned to various college-level readings such as articles. Instructors can introduce Cornell Notes to take notes not only in lectures by listening but also at home over reading materials. Technical terms, unknown terminology, confusing sentences can be written in one section to be asked in the following lecture whereas the main ideas obtained from the material can be written down in the other. A concise summary can be done in students' own words as a step for the comprehension of the reading material. In addition to university/college students, high school students can also apply these strategies in their literature lessons.

Conclusion

Structured note-taking strategies accompanied by graphic organizers stimulated my reading lessons. However, students' perceptions varied for the four strategies: Cornell Notes, Split-page, Fishbone Diagram, and Highlighting/Underlining-Summary. While some students used the strategies and organizers effectively, some found them unnecessary and a waste of time. Despite the variations in views, positive reflections were higher compared to negative ones.

Introducing such strategies that have graphic organizers helped these university students realize the possible ways to improve their reading comprehension skill in a foreign language. Not only in postsecondary education but at all levels, they could be introduced and taught. Students could also be trained with how to use numerous types of note-taking strategies, and graphic organizers as not all fit different learning styles or modes of learning. Introducing structured note-taking strategies with graphic organizers can keep attention and curiosity alive in our reading lessons.

About the Author

Bahar Cemre Karaağaçlı is an English language instructor who has worked from primary to tertiary level. She earned her Bachelor's degree in Foreign Language Education from Boğaziçi University in Istanbul, Turkey and has pursued her Master of Arts degree in English Language Teaching from Middle East Technical University in Ankara, Turkey. In tertiary level, she has taught English to university students at TOBB University of Economics and Technology in Ankara, Turkey and has given English language courses on skills and academic writing. Her research interests include teacher education, action research, comparative education, education policy, critical pedagogy, and teacher cognition. Email: bkaraagacli@etu.edu.tr, baharcemrekaraagacli@gmail.com

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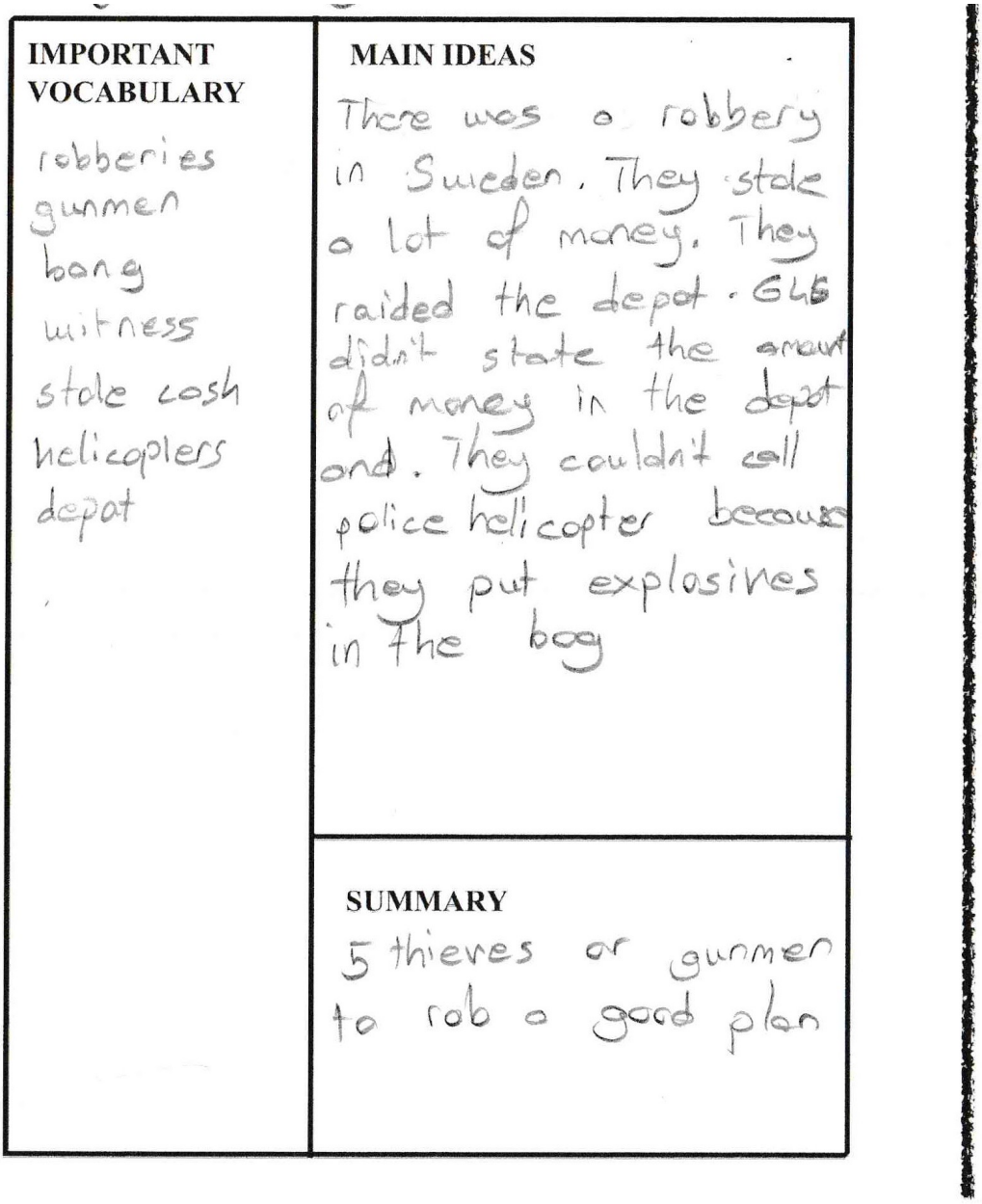
Appendix A: Final Worksheets

Cornell Notes



IMPORTANT VOCABULARY

robberies
gunmen
bang
witness
stole cash
helicoplers
depot

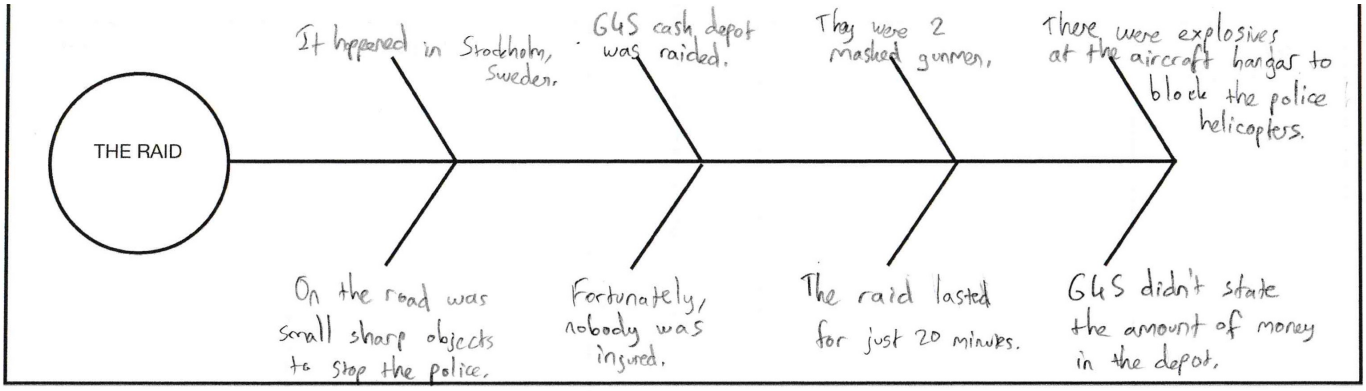
MAIN IDEAS

There was a robbery in Sweden. They stole a lot of money. They raided the depot. 645 didn't state the amount of money in the depot and. They couldn't call police helicopter because they put explosives in the bag

SUMMARY

5 thieves or gunmen to rob a good plan

Fishbone Diagram



Highlighting/Underlining - Summary

Please write the summary of the text.

A gang landed from a helicopter on the roof of cash dephot. He wore mask. He broke the windows Witnesses heard sounds One witness said two men went down from the helicopter on a rope. He/She saw them when they stole the money. The police found live bomb. The police said he had never experienced anything like it. Staff weren't injured in the robbery. Helicopter was found near a lake. Media believe that several million kronor was stolen. G4S which is cash depot offered a reward for information.

IMPLEMENTING PROJECT BASED LEARNING IN HIGH SCHOOL ALGEBRA UNDER THE SHADOW OF STANDARDIZED TESTING

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Abstract Project-Based-Learning (PBL) is a pedagogical methodology driven by authentic, engaging, and complex real-world questions. Practitioners sometimes experience obstacles when attempting to implement PBL while under pressure to prepare students for high stakes standardized tests. PBL is most frequently used in the humanities and sciences, less often in mathematics which may be seen as too abstract for the methodology. The research described in this paper set out to investigate both hurdles by exploring the question: How can project-based-learning prepare students to demonstrate mastery on a high-stakes standardized Algebra exam? This research was conducted by a teacher-researcher over the course of a school year with his 67 Algebra students in an urban high school serving mostly low-income immigrant families. After one semester of the PBL approach, the percent of students who'd passed the exam increased by 26% (from 64% to 90%) and the percent of students earning a 'college readiness score' increased 17% (from 49% to 67%) In addition to the quantitative exam results qualitative data was collected through the teacher's observational journal, student exit tickets, interviews with school administrators and other teachers. The paper identifies three key components leading to the successful implementation of PBL in a high-stakes testing environment: developing conceptual understanding through real-world connections, developing rigorous math skills, and exposure to exam-style problems. Together, these components boost students' engagement, resilience, and content knowledge leading to better exam performance and college/career readiness.

Keywords: teacher action research, project-based learning, PBL, math education, math, Algebra, Regents exams, standardized testing

Introduction

This paper presents teacher-action research conducted in the Algebra II classroom of a small urban high school in New York City during the 2019-2020 school year. The school serves mostly low-income immigrant families. The author of this paper is both the researcher and the teacher of the classes studied for the research. In New York State, students are required to pass five standardized (Regents) exams to graduate, one of which is the Algebra I Regents exam.

At the founding of our school, it was decided that the school's pedagogy would emphasize project-based-learning and it was assumed that there was no contradiction in being a Project Based school under a high stakes testing regime. In practice, this has been less than true. Our students struggled with the standardized Regents exams, with pass rates hovering around 50%. Our administration began talking about the need to 'blend' PBL with test-preparation but were unclear as to what that would mean in practice.

Due to a change in school policy, most of the students enrolled in the Algebra II classes studied here needed to retake the Algebra I Regents exam in January. In past years, nearly all students enrolled in Algebra II had already passed the Algebra I Regents. The possibility of preparing my students for this exam while staying true to my school's philosophy of project-based-learning inspired my research: How can project-based-learning prepare students to demonstrate mastery on a high-stakes standardized Algebra exam?

Literature Review

Project Based Learning. Project Based Learning – especially in math – is quite different from either Problem Based Learning, or just 'doing projects'. Usually, when projects are included in math classes, they are activities completed at the end of the unit, ranging from part of a lesson to multiple class periods. Under this model, at the end of the unit students apply what they learned in the unit to a real-world context. In the PBL world this first model is known as project-as-dessert (Larmer & Mergendoller 2010).

True PBL is envisioned as project-as-main-course. In this approach, the project is interwoven throughout the unit, rather than tacked on at the end (Steinberg 1997). The unit begins with a real-world driving question (for example, 'Can you survive on $2 a day?'). All instruction is geared towards developing the skills necessary to answer the driving question. At the end of the unit, students present a final performance task in which they show how they've answered the driving question; this task can take a variety of forms (e.g., an essay, a presentation, an infographic etc.). Throughout the unit, students assemble the components of their final performance task. These smaller pieces, called 'benchmarks', allow students to receive feedback on their mastery of the skills required for the performance task before their final draft. In the project-as-dessert model students learn math skills then complete an application. When the project is the main course students learn *through* the project. Answering the driving question necessitates learning the math. Students work on the project and develop their math skills simultaneously and seamlessly.

Test-Prep. Test-prep is often viewed as being at-odds with good teaching (Rodriguez 2013). Given the high stakes of standardized tests in this era after No Child Left Behind, administrators, teachers and students fear the drastic consequences if students perform badly on the exam (Luis & Hardy 2015). This study focuses on New York State's Regents which has incredibly high-stakes-- students cannot graduate high school without passing the exam. This kind of pressure often leads to pedagogy that focuses exclusively on the exam--practicing exam problems and test-taking strategies (Berliner 2011). Projects, investigations, and other constructivist pedagogy are thrown out in a rush to cover all the

content and drill-and-kill certain procedures. This model produces students whose understanding is a mile wide and an inch deep (Winston 2019). Even this surface level understanding has often evaporated come the time of the test. This strategy forgets that having a good grasp of the content taught on the exam also helps students' exam performance (Underwood 2014). If students are taught only through drill-and-kill test-prep, they won't have a good understanding of the underlying concepts which will hurt their exam performance. Good pedagogy is even more-- not less-- necessary when a course culminates in a high-stakes exam (Blazer & Pollard 2017). The curriculum created for this research project begins with sound pedagogy- developing students conceptual understanding through Project-Based-Learning. Test-prep activities are included as a supplement to-- not a replacement for-- sound pedagogy.

Methodology

Educational Intervention. Due to a policy change, many of the students enrolled in my course would need to retake the Algebra I Regents exam in January. Over the summer I reconfigured my curriculum to enable all students to pass the Algebra I exam while ensuring that students who chose to take the Algebra II exam would be prepared to do so in June. I believe in depth over breadth; I knew that it would be better to ensure that my students were proficient with a few key skills than to cover all the content on a surface level. The former approach would ensure that students were able to access the skills they learned both on the exam and in future contexts they encounter as professionals and citizens.
I knew that the best way to introduce new concepts is with real world context. Students learn best when they can connect their new learning to their prior knowledge. To this end, I began the year with an 8-week long unit on modeling the key features of polynomial functions. This unit was divided into two projects- the 'baseball home runs' project (which covers Algebra I standards) and the 'parabolic solar cooker' project (which covers Algebra II standards).

As we finished each project, we spent a week working on questions from prior exams that test the skills students developed in the project. After completing the 8-week modeling unit, we moved onto a three-week unit about equivalent expressions and factoring. This unit builds heavily on the conceptual understanding of zeros that students built in the 'baseball home runs' project. The equivalence unit did not have a real-world project; instead, lessons were based around previous exam questions. We started by learning strategies to solve the simpler problems from past Algebra I exams and built up to applying these strategies to tackle the challenging Algebra II problems. In addition to learning math skills, we also developed test-taking strategies including 'doing the easy problems first,' 'checking answers with the graphing calculator,' and 'annotating constructed response problems.' After the 'equivalent expressions' unit we completed a unit on 'simplifying and solving equations' through the 'soda can redesign project.'

We ended the Fall semester with a unit on imaginary numbers. This was the last unit we covered before students took the Algebra I Regents Exam in January. Imaginary numbers are Algebra II content. I chose to teach an Algebra II topic right before my students took the

Algebra I exam (instead of reviewing Algebra I content) because, even though imaginary numbers would not be tested on the January exam, this content required students to practice most of the key skills tested on the Algebra I exam (e.g., factoring, quadratic formula, using a graphing calculator, and deciphering exam problems). Practicing these skills on more advanced problems helped ensure that students would be ready to solve the simpler problems on the Algebra I exam.

After focusing the Fall semester on polynomial functions, my students spent the Spring semester studying linear and exponential functions. In the first unit of the Spring Semester students used linear systems to determine if it is possible to survive on the global poverty line of $2 a day. After completing the Global Poverty project, we began our exploration of exponential functions. Through this project students learned about proportional reasoning, exponential functions, and logarithms to create their Future Financial Plan. Table 1 detailing the curriculum I designed and implemented in this research project:

Table 1: Project-Based Algebra II Curriculum

Unit: Modeling Polynomial Functions *Project Name:* Green Monster *Driving Question:* Which MBL stadium is it hardest to score a home run in? *Performance Task:* Argumentative essay: Students answer the driving question and cite numerical evidence they have calculated throughout the project to support their claim *Math Content:* graphing equations, vertex & zeros of a parabola, creating the equation for a quadratic function given its vertex and zeros, evaluating functions for a given value, transformations of polynomial functions
Unit: Modeling Polynomial Functions Project *Name:* Parabolic Solar Cooker *Driving Question:* Why is a parabola the best shape for a solar cooker? *Performance Task:* Build and test a parabolic solar cooker *Math Content:* focus and directrix of a parabola, creating and graphing quadratic equations
Unit: Equivalent Expressions *Project, Driving Question & Performance Task:* n/a *Math Content:* factoring polynomials, evaluating equivalent expressions, graphing calculator *Methodology:* lessons designed around previous exam questions, explicit instruction in test-taking strategies

Unit: Solving Equations *Project Name:* Soda Can Redesign *Driving Question:* How can I redesign the classic soda can have a new, appealing shape while retaining the original volume? *Performance Task:* Create a catalogue of new designs for a soda can *Math Content:* solving one-step, two-step, and multi-step linear equations; solving equations with fractions; solving equations for one variable in terms of another; solving quadratic equations
Unit: Imaginary Numbers *Project, Driving Question & Performance Task:* n/a *Math Content:* factoring, quadratic formula, equivalent expressions, interpreting graphs *Methodology:* review skills learned throughout the semester by applying them to the new context of imaginary numbers
Unit: Linear Systems *Project Name:* The Global Poverty Line *Driving Question:* Can you survive on $2 a day? *Performance Task:* Argumentative essay. Students answer the driving question and cite numerical evidence they have calculated throughout the project to support their claim *Math Content:* creating algebraic equations to model real world scenarios; graphically solving systems of inequalities; algebraically solving multivariable systems of equations
Unit: Exponential Functions, Sequences & Logs *Project Name:* Future Financial Plan *Driving Question:* When will I become a millionaire? *Performance Task:* Students present their future financial plans *Math Content:* writing and evaluating exponential equations; compounding frequency; calculating percentages; sequences; series; solving exponential equations with logs

Data Collection This study of employing project-based learning to improve student outcomes on a high-stakes exam was conducted with the 67 students enrolled in my Algebra II courses during the 2019-2020 school year. The January Algebra I Regents scores were my primary data source. For triangulation, I interviewed our instructional coach and

assistant principal on the philosophy and strategies behind multi-leveled classes, and on best practices for blending PBL and test-prep. Additionally, I conducted two exit-ticket surveys with one of my three sections of students (it was not possible to survey all students due to time constraints). These surveys asked students about what they had enjoyed, found challenging, and learned in our projects. I also journaled about my own observations of my classes' day-to-day experiences of our blended PBL/test-preparation curriculum.

This project began in Summer 2019 when I received the data about my incoming cohort of students; I learned that my new classes would have different needs then my previous years' classes of Algebra II students. Specifically, since our school was no longer offering an Algebra I repeaters class, many of my 'Algebra II' students would need to prepare to retake the Algebra I exam. After spending the summer revising my curriculum it became clear that this new challenge would be a natural focus for a research project. In the Fall I formalized my research question, analyzed my assumptions, and began teaching.

I began the year with the following hypotheses:

1. PBL alone will not prepare students to do well on the exam.
2. Students need to be exposed to exam-style questions before they sit for the exam
3. Students will have a better understanding of 'traditional' math problems and procedures if they have been first exposed to the content through projects that connect to their funds of knowledge.
4. The closer to the exam date we get, the more exam focused teaching & learning needs to become
5. It is not possible to create real-world projects for all exam content because some exam content has no real-world applications that are accessible to high school students

The data corroborated some of the ideas and challenged others. I organized my daily journals around these hypotheses. I also began to look at research conducted by other teachers investigating similar questions and revisited the theoretical research underpinning constructivist pedagogy, as discussed in the literature review of this paper. To incorporate the perspectives of other stakeholders in the community, I interviewed two administrators at my school and conducted the first exit-ticket survey with my students. The first three of my original hypotheses appeared frequently in the data I collected. Hypothesis 4 had less supporting data. Hypothesis 5 was entirely debunked as (nearly) every unit we studied was centered around a real-world project (as detailed in the Educational Intervention section).

Before my students took the exam in January, I read through all this qualitative data and found the themes of Project Based Learning, Test Prep, and Heterogeneous Grouping mentioned most frequently. After I received the results of the January exam (which are detailed in the Results section) I looked back through the fall data using these themes to identify the specific classroom practices that led to the exam results. In this final analysis an additional theme of Engagement emerged as an important contributor to student's success. The importance of students' buy-in crystallized as an essential theme from the final student exit-ticket survey. In this survey students were asked about their favorite classroom

activity. Nearly all students listed experiences where they felt successful and interested in what they were learning. Each of these themes is further explored in the results section below, along with their connection to the qualitative and quantitative data.

Results and Discussion

The primary data source was my students' scores on the January 2020 Algebra Exam. Overall, my students did very well (see Figure 1). 75% of my students who had previously failed the exam passed this time (24 of my students took the exam, 18 passed). This is the highest pass rate of my career, and much higher than my school's overall pass rate of 36% (schoolwide, 86 students took the exam and 31 passed). In addition, all students who still failed had their score increase from their previous attempt at the exam. After this exam, the percentage of students enrolled in my Algebra II course who have not yet passed the exam decreased from 36% to 10%- a 26% drop (previously 24 students had not passed the exam, after January only 7 students had not passed the exam), and the percentage of students who have scored College Ready increased from 49% to 64%- a 15% gain (previously 33 students had scored College Ready, after January 43 had earned this score). For students who retook the exam in January (n=24), the results from students prior Algebra Regents scores (M = 58.1, SD = 7.4) and January 2020 Regents Scores (M = 65.5, SD = 7.0) indicate that my blended PBL/test-prep curriculum resulted in an improvement in students exam scores; using paired t-test, gives $t(23) = 4.7$, $p = .00101$. The project-based curriculum intervention had a demonstrable positive impact on students' exam scores.

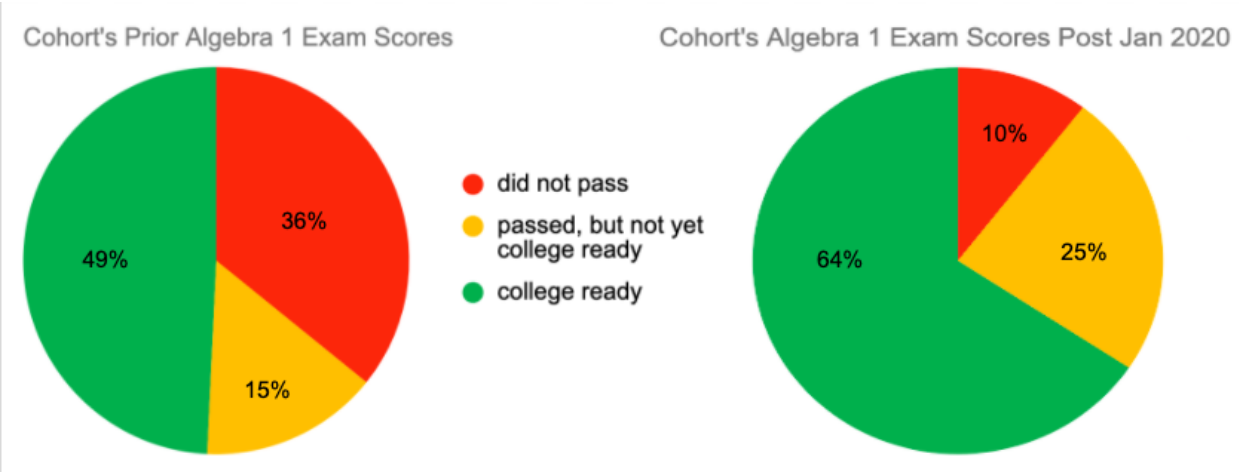

Figure 1: Cohort's Exam Scores Pre- and Post- Intervention

Developing Conceptual Understanding through Real-World Connections. Using projects as students' first exposure to new content builds a deep foundational understanding of mathematical concepts. In Project-Based-Learning all skills and content are taught through questions students generate while completing the project-- my students first learned about the 'vertex' as the highest point a baseball reaches on its path, defined 'zeros' as the start and end point of a ball's trajectory, and discovered the 'focus' as the hot point inside their solar cooker that will most efficiently toast their marshmallows. My research has shown me that students have a better understanding of these abstract concepts when they are first

exposed to them in familiar contexts. Having a deep understanding of the underlying concepts enabled students to master the skills quickly and remember them later. Having those real-world connections gives students things to latch on to. Starting the year with real-world projects built a strong foundation for students to later use to solve abstract exam problems. My research shows that students will have a better understanding of 'traditional' math problems and procedures if they have been first exposed to the content through projects that connect to their funds of knowledge (González, Moll, & Amanti 2005). Students themselves recognize the value of building math skills through real-world connections. Two students listed the 'baseball home runs' project as the experience they learned the most from because it was 'easy'. The math in this project is quite complex--students create and transform multiple forms of quadratic functions to model baseball hits. In traditional Algebra II classes students often struggle to manipulate these different equation forms, yet my students found the project 'easy'. This data indicates that students find complex math to be accessible when it is embedded in familiar context. Overall, 71% of students (10/14) identified one of the real-world projects as the class activity they learned the most from. But the projects are the starting point, not the end point. While developing skills through fun projects, students also need opportunities to practice those skills on more traditional problems.

Developing Rigorous Math Skills through PBL. Through projects, students can build fluency with rigorous math skills. After one semester of learning through my blended Project Based Learning approach my class experienced a significant increase in standardized test scores. Doing well on this 37-question exam requires students to correctly employ a variety of math procedures. Authentic projects can provide opportunities for students to practice rigorous math procedures. For example, as part of answering the question "Can you Survive on $2 a day?" students had to solve a three-variable system of equations to achieve the correct balance of cost, calories, and nutrients. Solving this required 37 steps of algebra.
After the project, I gave my students an exit ticket asking what they learned from this project. Students mentioned multiple math skills including how to 'solve a three-variable system of inequalities', 'modeling inequalities', 'graphing', and 'creating equations'. When cross-checked with my unit plan, these student-reported skills mapped closely to my listed objectives. There is a common misconception that when doing a project students may be creating drawings, preparing presentations, or following mapped-out steps to produce a product, but that in doing so they are not rigorously engaging with the content. We have all witnessed or at least heard of presentations that read as if they are simply copied from Wikipedia pages, or projects where students spend an entire period coloring a cathedral. The flaw in these activities is usually that they are not actually authentic projects. An authentic project is driven by a real-world question that students need to apply discipline specific skills to answer (Stienberg 1997). When teaching and learning are oriented towards answering this question students are required to practice the same skills that professionals use when answering these questions. The context helps students check their answers for reasonableness while grounding the abstract math in something relatable. While solving the '$2 a day' problems students often caught their own mistakes without teacher intervention. For example, when they calculated a negative, they realized you can't eat a negative amount of food and searched back through their work to find their mistake. Real-world

problems and projects give students a familiar context to hold onto while practicing complex math procedures.

Exposure to Exam-Style Problems. Given the success of the Project Based Learning approach, you may be wondering why I didn't take an entirely project-based approach to the Algebra II curriculum. To demonstrate their full knowledge on standardized tests, historically marginalized students need to be exposed to exam-style questions before the exam. Students need explicit opportunities before the exam to practice exam questions. In the Fall, I documented multiple instances of students struggling to apply a skill they've learned to an unfamiliar context. For example, on November 6th I wrote in my journal: "Most students seemed to remember how to do equivalence on the calculator. But they struggled when they had to rearrange first. In general, students struggled with the problems that were even slightly different from what they were familiar with, even if it's the same skill. Some even struggle to plot points. None know how to do transformations." All the skills mentioned in this entry had been taught previously. Lessons devoted to working through exam-style problems are needed for students to practice applying the skills they have learned through their projects to other contexts. Even though it's frustrating for both the teacher and student to witness the class struggling through these problems, it is better that they struggle in a supportive classroom environment than on the day of the exam. At the end of the semester this struggle paid off as 75% of students (18/24) who had previously failed the exam passed.

When working independently my students struggled with problems that were even slightly different than what they were familiar with, even if it's the same skill. One potential pitfall of PBL is that after students have done a particular project, they may not have generalized the skill beyond the specific context of the project. In addition to doing the project (perhaps after), students need opportunities to practice the skills in new contexts. In the traditional project-as-desert model students first learn new math skills, then finish the unit by applying these skills in context. True Project-Based- Learning flips the traditional project-as-dessert model on its head. In my classroom students built their skills and conceptual understanding through the project, then practiced applying their learned skills to other contexts. This practice may be interspersed throughout the project, especially if the project requires multiple skills or iterations. The key here is that the project comes first (not last); the project drives the learning from the beginning.

In past semesters, when I have taken an entirely project based approach my students have struggled to apply the skills they learned through projects to the exam. This is because the exam usually asks questions outside of context, and often uses language and notation students are unfamiliar with. Students must be exposed to the test formatting ahead of time, so it doesn't serve as a barrier keeping them from demonstrating their knowledge. Sometimes I am blind to these roadblocks until students trip over them. For example, when observing one of my ELLs (English Language Learners) whose home literacy is in the Bengali script, I realized that he struggled to tell the letters t and f apart. For another example, in mid-October I gave my students some practice exam problems on transformations. We had covered transformations earlier in our baseball project. However, students were unable to

solve the problems because they were written in function notation. I taught them how to interpret function notation and when we reassessed students were able to solve problems requiring them to understand this notation. These are a few small examples of a bigger pattern. Students need to understand what the exam questions are asking before they can answer the question. Practicing with exam questions is the best way to build these skills. If we only teach through projects students will experience barriers to accessing their knowledge on the exam.

When asked about what class activity she has learned the most from, one of my students who had not yet passed the Algebra exam said that "So far to be honest I've learned more from Regents prep. I'm starting to feel confident." This new learning and increased confidence led her to a 16-point increase in her exam score. After the exam, multiple students came to me and attributed their passing scores to employing the skills that I taught them. Specifically, they mentioned our strategies of 'doing the easy problems first', 'checking answers with the graphing calculator', and 'annotating constructed response problems'. I know that these test-taking skills would have been insufficient to earn a passing score if students had not also had sufficient mathematical knowledge. But teaching into these test-taking strategies gave students the keys to unlock their knowledge. These are skills that many of us take for granted, but that historically marginalized students need to be explicitly taught.

Before January 2020 none of my students with IEPs (Individualized Education Plans) had earned a college readiness score, in January two students with IEPs earned this score. Even more strikingly before January 2020 none of my students classified as ELLs had even passed the exam. In January 2020 one of my ELLs passed the exam. While these raw numbers are small, the percentages are large: the percentage of my students with IEPs who earned an exam score indicating 'college readiness' increased by 33% and is now within 12 points of the general education students (before entering my class, the gap was 32 points). Similarly, the percentage of my English Language Learners who have passed the exam increased by 33%. The data above represents students who chronically struggle in school who were finally successful on a standardized exam after participating in my class. As I write this, I see each of their faces. After the exams had been graded, I asked them if they wanted to know their score. I clearly remember one student resignedly responding: 'What? I'm sure I failed again' and then whooping for joy when I told her she had not only passed but earned a college readiness score. Another student danced around my classroom after hearing her score, waiving the report like a victory flag. So, though the sample size of formally classified exceptional learners may be small, the human impact of this work is gravely significant, especially for these most marginalized of students. This data shows that my blended approach-- learning through projects combined with explicit practice on exam questions-- enabled more historically marginalized students to meet state standards. My research is focused on historically marginalized students because that is the population of my classroom, but it might well be beneficial for all students to have explicit instruction in test-taking strategies. To be clear, this test-preparation is not a replacement for genuine constructivist teaching and learning, rather it is a bridge to allow students to demonstrate

all they have learned through authentic learning experiences in the inauthentic context of a standardized exam.

Engagement. Project Based Learning brings engagement, excitement, and joy to the classroom. According to our school's assistant principal, "Our theory of action is.., that taking a project-based approach- the relevance and learning the skills within context- is more engaging." When asked what they enjoyed about our class, 10/14 students surveyed listed projects. The most common response (6 students) was our Solar Cooker Project. This is quite an authentic project-- students design, build, and test a solar cooker to roast s'mores. On the day we tested the cookers I overheard students saying, "I'm excited to see if this solar cooker thingy will work", "Yo! Look! It's melting", "I'm not gonna lie, this project was kinda lit", "I didn't want to go outside because it's cold, but it was actually pretty fun." This data indicates that students are engaged when doing authentic projects. This kind of joy in the classroom is valuable in and of itself, while also motivating students' learning.

This claim is further triangulated by my observational data. I have noticed that students are more willing to struggle through challenging mathematics without giving up when the calculations are rooted in a context that students see as worthwhile. During our financial literacy unit students would become frustrated with the tedium and challenge of the calculations. But nearly all of them stuck with it. I'd tell them that banks make things confusing on purpose so that we will trust them with our money. But why should you trust someone else with *your* money? Motivated by the desire not to get 'scammed' students powered through the project. In the end, they were clearly able to articulate how to choose the best interest rate, the difference between various forms of compounding, and what to look out for in the fine print of savings accounts. The project context gave students a compelling reason to wrestle with challenging mathematics, while also leaving them better prepared to understand their future (and current) finances. When my former students ask me for letters of recommendation, rarely do they mention their exam scores, but they often remember our projects and even discuss how they've applied what they've learned outside of school. When students are actively engaged in class the lessons are more likely to stick; they are more likely to remember what they have learned both on the exam and later in the real world. (Tomaszewski, Xiang, & Western 2020)

Implications

In this era of high-stakes testing, many teachers and school leaders have moved away from what they know to be sound pedagogy in a panic to improve test scores. This has been especially true in schools like mine that serve mostly poor Black and Brown students. While it is true that students need to be previously exposed to exam-style questions to show off their knowledge on the exams, it is equally true that students must have deep content knowledge to perform well on exams. This last statement may seem to be a tautology; in that case it should be obvious that even under the pressure of high stakes testing we cannot move away from sound pedagogy. We, as educators, must employ the practices demonstrated to be effective by both research and our professional experience. Without

the deep content knowledge developed through strong pedagogy our students will be prepared neither for the tests nor global citizenry.

What do these grand statements mean for teachers faced with the task of preparing students for a high-stakes exam, especially for teachers with the added urgency of preparing students to pass an exam they have previously failed, an exam written by people who are not like them, an exam that is a gatekeeper to future opportunities? We must teach in the ways we know to be best. For me and my students, that means Project-Based-Learning. I don't claim that my answer, or even my implementation of PBL is right for all students in all circumstances. But through my research I have come to some new understandings that may have implications for others.

Conclusion

Project Based Learning has a home in the math classroom. It need not be diluted into problem-based-learning or project-as-dessert or-- worse yet-- thrown into the bin altogether for more algorithmic practice. Learning is best achieved when the new understandings are connected to prior knowledge. Math is no exception. This means that new math concepts should be introduced in contexts familiar to students- for example, using baseball hits to introduce parabolas, savings plans to introduce exponential growth, or annual temperature fluctuations to introduce trigonometric functions. Students will more quickly develop a stronger understanding of new mathematical ideas when they can map them to things that are already familiar with - the landing point of a baseball becomes the zero of a parabola, the multiplicative nature of savings growth creates the need for exponential notation, the 12 months of a year describe the period of the temperature function. After grounding their conceptual understanding in their prior knowledge students can then apply their new knowledge to new contexts, or even to decontextualized problems. In fact, it is vital that students are eventually exposed to multiple applications of each concept to fully generalize their understanding. Furthermore, rigorous math procedures can be practiced through Project-Based-Learning. Designing packaging, optimizing nutrition under poverty, and calculating how long it will take to pay off a loan are all real-world tasks that require powerful math procedures. In fact, mathematical concepts were originally uncovered to describe real-world phenomena, and algorithms were developed as tools for solving specific problems encountered by STEM professionals. Students will have a better understanding of mathematics if they discover it in these same ways. In conclusion, through my research I have learned to reject the false choice between test-preparation and sound pedagogy. Students do well on the tests when they are taught well, and this means that math should be taught in context.

About the Author

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I CAME. I SAW. I CREATED. — AN ACTION RESEARCH PROJECT ON HOW LEARNING WITH MINECRAFT AFFECTS STUDENTS' ENGAGEMENT IN CLASSICAL STUDIES

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Abstract Video games have the potential to enhance students' engagement in the traditional sense (i.e. sustaining students' cognitive, behavioural, and emotional interest in learning), but also assist what Gee (2003) calls 'active engagement'. While educators are beginning to take the aesthetics of video games and apply these in practice to improve students' interest in, and enjoyment of, learning, the true potential of video games lies within their ability to engender individuality. The video game, Minecraft, is emerging as an appealing digital environment that can provide secondary educators with solutions to address the complex nature of students' engagement in contemporary practice. This project explores how the flexibility of Minecraft's open-world "sandbox" environment lends itself to the pedagogical approach of problem-based learning to enhance students' engagement in the context of New Zealand secondary education. Characterizing the relationship between pedagogy, Minecraft, and students' engagement as a complex problem, the project followed an action research process to develop a digital game-based learning experience for a senior high school Classical Studies class. The students involved focused on using Minecraft to (re)create Greek mythology. Quantitative and qualitative data were gathered through the post-experience survey, teacher observations, and student work. The findings illustrate that problem-based learning with Minecraft promotes a highly immersive environment where students' can be creative and demonstrate their understanding of mythology in ways not possible in the physical space of the traditional classroom. Students were able to actively engage in the learning process to construct an experience according to their personal goals and learning preferences – what students thought and what they chose to do mattered and this improved their confidence and independence as learners. While this project focused on how game-based learning with Minecraft might enhance students' engagement, it also illustrates an innovative instructional approach not commonly found in contemporary New Zealand secondary educational environments.

Keywords: teacher action research, Classical Studies, Greek mythology, Minecraft, engagement, game-based learning

Introduction

This paper reports on an action research project that investigated how the video game *Minecraft*, in combination with problem-based learning affected students' engagement in the context of a senior secondary school class studying Greek mythology. The project was implemented at an all-girls' high school in New Zealand in 2019. The teacher-researcher undertook this capstone project in collaboration with supervisors to partially fulfill the requirements for the degree of Master of Contemporary Education offered by The Mind Lab, a New Zealand Qualification Authority certified tertiary institute.

Since the age of sixteen, the teacher who led this research has found Classical Studies to be a stable source of inspiration and meaning. Wanting to share this passion with his students, he aims to develop innovative ways of delivering the subject to help revitalize his teaching practice, so today's digitally oriented students may gain insight into what the world of antiquity offers. The idea of introducing *Minecraft* in practice arose when his interest in video games was revived in 2018 – after ten years of inactivity. During preliminary research, the teacher noticed how different elements of some video game environments combined to create an immersive and gratifying experience. Encouraged to pursue ways in which video games might be applied in pedagogical contexts by course supervisors, the teacher initiated an action research project that sought to utilize the versatility of the *Minecraft* environment with the aim of establishing an innovative way of learning about Greek mythology.

Seymour Papert (1990), one of the pioneers in computer-based learning, believed that the computer's most significant educational potential was in supporting the empowerment of the individual. Underpinned by Papert's vision, this project aimed to explore the relationship between *Minecraft*, problem-based learning, and students' engagement in a senior secondary Classical Studies classroom. It aimed to answer the central research question: How might the use of *Minecraft*, in combination with problem-based learning, affect students' engagement in Classical Studies?

A body of literature about how students can learn in preparation for 21st-century life has grown exponentially over the last decade. Yet, this research struggles to make its way into daily classroom practice (Ananiadou & Claro, 2009; Schleicher, 2012). Such research calls for educators to place greater emphasis on designing technology-enhanced, student-centred learning tasks in the hope that students might develop competencies, like creativity and problem-solving, that could help them to participate and succeed in a future characterized by dynamic change and technological advancement (Microsoft and McKinsey & Company's Education Practice, 2018; Scott, 2015; Voogt & Knezek, 2018; Voogt & Roblin, 2012). While this push for greater student-centricity and inclusion of digital technologies in schools is predominantly characterized as a pragmatic solution to the pending displacement of low-skilled workers by automation (Microsoft and McKinsey & Company's Education Practice, 2018), it aligns with, and can be underpinned by, the philosophical notion that education should be about the empowerment of the individual as opposed to instruction and being taught (Papert, 1990). This philosophy runs counter to the prevailing pedagogical approaches practised in some contemporary New Zealand high schools. A report published

by the Education Review Office (2018) found that curriculum design in high schools is largely based on preparing students to pass the National Certificate of Educational Achievement (NCEA), which attracts content-driven, teacher-centred practices, like lecturing. In a digital society where preserving and enabling individual autonomy are intensifying concerns, re-energizing classrooms with emerging digital technologies, and broadening pedagogical approaches to allow for more student-centricity might enhance students' enjoyment of learning and engagement in competency development (Voogt & Knezek, 2018). Through applying the combination of *Minecraft* and problem-based learning, this project offers researchers and practitioners a small, but concrete example of how the combination of a popular digital technology and student-centred pedagogy can support students in being actively engaged in learning.

Literature Review

The first part of the literature review is organized according to the works of some key figures who have lived at the intersection of video games and education. Together, their publications help to establish our (the authors) knowledge on digital game-based learning. The constructionist theory put forward by Papert & Harel (1991) is complemented by authors like Gee (2003), Kiili (2005), Prensky (2010), and Van Eck, (2006) who attempt to bridge the divide between theory and teaching practice by describing the relationship between video games and learning. Where these authors provide us with a *why* and a *how* that helped inform the pedagogical design of this project, Ito (2009), in her role as an anthropologist, contributes to our historical understanding on the subject by providing a socio-cultural look into the reasons for the evolution of video games in the modern classroom. The second part of the literature review provides a survey of relevant classroom-based studies that seek to understand and show how *Minecraft* might support teachers in providing novel, engaging ways of learning for students. The literature review concludes by defining our approach to establishing what *engagement* means in the context of this project.

Relevant Experts. Papert (1990) believes that the most significant role digital technology can play in education is in supporting the empowerment of the individual. His learning theory, constructionism, stipulates that learning occurs when students are actively involved in creating artifacts (Papert & Harel, 1991). Problem-based learning is an example of constructionist theory in action: it is an approach where students learn about a subject through solving a series of problems that require them to construct their understanding of that subject by making a product (Hmelo-Silver & Barrows, 2006; Papert, 1990). Some harmony exists between problem-based learning and the way people learn through the video game experience (Gee, 2003; Kiili, 2005). Indeed, Kiili a digital game-based learning expert, states, "Games provide a meaningful framework for offering problems to students. In fact, a game itself is a big problem that is composed of smaller causally linked problems" (2005, p. 17). While researchers tend to focus on how video games encourage problem solving through providing customizable and immersive experiences for players, they do not necessarily provide specific practical insights as to how video games might be applied in classroom settings (Gee, 2003; Prensky, 2010; Van Eck, 2006).

Gee (2003) argues that popular off-the-shelf video games support effective learning through empowerment, problem-solving, and facilitating deep understanding. He further states that video games support learning because the actions players choose to take affect the game's outcomes. Video games can provide a highly customizable learning experience where players co-create the game through the decisions and actions they take, which improves players' sense of control. Additionally, Gee (2003) suggests that video games support learning through fostering problem-solving. Players are required to apply knowledge to solve problems during gameplay in an iterative fashion, which improves content retention, creativity, and self-confidence. Finally, Gee (2003) believes that video games promote academic self-efficacy through situated learning: not only does knowledge take on a deeper meaning when it is applied in a virtual environment where it has practical utility and is incorporated into players' experiences, but also because video games reward players for applying knowledge, players experience a sense of achievement that boosts their self-confidence.

In contrast, Ito (2009) presents a cultural history on the use of video games in classrooms. She contends that educational gaming software developed during the 1980s and 1990s represents a microcosm of broader binary tensions going on in society. For example, some digital games are used to reinforce traditional, structured methods of learning (*Where in the World is Carmen Sandiego? Kahoot*), where others place more control in the users' hands to foster individual development (*SimCity*). While reducing video games used in classrooms during this period to instruments promoting one of two sides oversimplifies the matter, Ito argues these opposing dimensions drove the development of educational gaming software. More notably, she states that, "Today's children… are growing up in a media ecology where producing, modifying, messing around with… and sharing digital media are part of everyday life" (2009, p. 185). Aligned with Papert (1990), she concludes that contemporary educators should adopt video games in practice to support the development of the individual; that the student should program the game, and not vice-versa.

Minecraft in Practice. Minecraft – and Mojang, the company that developed the environment – was purchased by Microsoft in 2014. Since then, the *Education Edition* has been developed, which is purposefully designed for use in classrooms. *Minecraft* is an unusual video game as there are no set goals or predetermined storylines for the player to follow. The open-world environment supports sandbox style gameplay, where the player constructs the game by following their curiosity, setting their own goals, and through manipulating the highly malleable environment towards those ends. Figure 1 shows a typical landscape the player sees when they spawn into a new *Minecraft* world. While typical players use the game as a platform to build all manner of things, from engineering a zombie apocalypse to recreating architectural wonders, its flexibility to effectively support the interests of the user makes *Minecraft* an appealing pedagogical tool.

Figure 1: A Typical Minecraft Landscape

Since *Minecraft's* release in 2011, a small body of literature has emerged, which seeks to understand how the environment can be utilized by teachers in practice. Karsenti, Bugmann & Gros (2017) provide a case study of how gamification (the application of game design elements in pedagogical contexts) illustrates *Minecraft's* potential for improving students' enjoyment of learning and supporting their development of creativity, collaboration, and problem-solving skills. Though their study was broad and overtly positive regarding the educational benefits of gamification and *Minecraft*, the wide range of data collected and analyzed comprehensively establishes *Minecraft* as an educational game. Additionally, Marcon (2017) and Craft (2016) used *Minecraft* as a pedagogical tool in high school settings to support students' literacy practices. While Marcon's (2017) classroom study is primarily concerned with how Gee's (2003) game-based learning principles might be used as a lens to interpret girls' literacy practices when playing *Minecraft*, it hardly addresses the design of the learning task students used and so has limited practical utility for classroom teachers. In contrast, Craft's (2016) pedagogical approach is clear. To make learning Latin more immersive for his students, Craft (2016) introduced a socio-cultural project where students watched instructional videos he created, conducted individual research, and rebuilt artifacts of ancient Rome in *Minecraft*. He encouraged students to continually revise their artifacts based on their research to promote accuracy. This cyclical element was a strength of the project as students were able to situate knowledge in the virtual environment, which in turn, embedded new learning. Though Craft (2016) also cites Gee's (2003) principles as influential, he established meaningful connections between video game design and learning theories. For example, he observed that good video games and the Zone of Proximal Development (Vygotsky, 1980) both encourage players/students to operate at a level of challenge just beyond their current ability. Craft (2016) used this principle to guide his teacher interactions with students, so he was more likely to provide the kind of scaffolding that supported individual progress during the project. Of the studies mentioned here, Craft's (2016) is the most salient. His work propels Minecraft beyond a trending gimmick in education. The key reasons for this appear to be his passion for teaching the Latin language, his ability to play Minecraft, and a deep understanding of the theory behind the pedagogy that informed his students' digital game-based learning experience. A precondition for such learning is student engagement.

Engagement. The transdisciplinary nature of this digital game-based learning project made the notion of engagement complex. Following principles of complexity leadership developed by Snowden & Boone (2007), instead of imposing a singular definition of engagement, three definitions were drawn from relevant sources:

1. In education, engagement is generally defined as a meta-construct for behavioural, cognitive, and emotional engagement in learning activities at school (Fredricks & McColskey, 2012).
2. In video game research, engagement is commonly understood as a player's level of game involvement and is viewed as a progression from immersion, presence, absorption, to dissociation (Brockmyer et al., 2009).
3. In digital game-based learning, Gee (2003) defined engagement as either active and critical or passive and inert. He argues that where video games encourage the former, school environments promote the latter.

Where the first two definitions emphasize students' (or players') interests, enjoyment and involvement in learning or playing, Gee's (2003) approach is more concerned with how video games provide environments that foster active engagement in learning. While the teacher-researcher worked with all three definitions, Gee's (2003) approach to engagement emerged as the most important. Firstly, the learning principles he developed to explain how video games actively engage people in learning were more relevant to understanding how students were participating in this project. Secondly, his approach to engagement focuses on how learning with video games can support the empowerment of the individual, which resonates with the constructionist theory that underpinned the pedagogical approach taken (Papert & Harel, 1991).

Methodology

The central aim of the project was to understand how *Minecraft* and problem-based learning might affect students' engagement in Classical Studies. The project followed the principles and process of McNiff (2010) and McNiff & Whitehead (2005) who indicate that action research is a systematic inquiry that improves practice, generates new theory, and is subjected to the critique of others. These elements were desirable in a classroom-based project such as this where collaboration and pedagogical risk-taking for the sake of innovation were paramount.

The action research process followed these steps:

1. The identification of a problem
2. The imagination and development of a solution
3. The implementation of the solution
4. The evaluation of the solution
5. The modification of practice based on that evaluation

(McNiff & Whitehead, 2005)

Participants. The project involved sixteen female Classical Studies students aged between 15 to 17 attending an all-girls state secondary school in New Zealand. It occurred over three

weeks and encompassed twelve one-hour lessons in a school computer lab where all machines had the *Minecraft Education Edition* software installed. Though most students had prior experience playing *Minecraft*, the class was provided with a one-hour introductory lesson where those with less experience could learn how to use or reacquaint themselves with the game. All students involved signed consent forms that outlined the purpose of the project, and how the data would be collected and treated. Ethics approval was obtained from the Mind Lab Ethics Panel before project implementation began.

Instrumentation and Collection. The instruments included the post-experience survey, the teacher's reflective journal, and a digital text produced by students in *Minecraft*. These instruments, which are detailed below, were selected because, in their totality, we believed they would provide a rich picture of the project's outcomes: where the post-experience survey aimed to capture a broader view of students' perspectives of their game-based learning experience, the reflective journal and mythic game students built in Minecraft offer a more specific, in-depth analysis of how students engaged in the experience. In collaboration with supervisors, the teacher decided that this combination of instruments would improve the credibility of the research as they enabled multiple perspectives of the same phenomenon to be interpreted and understood (Ivankova, 2014; McNiff, 2002).

The Post-experience Survey. The post-experience survey consisted of sixteen items and two questions that were designed to generate quantitative and qualitative data respectively to establish a balanced picture of students' engagement in their learning experience. The arrangement of the survey into three sections was influenced by the arrangement designed by Bolstad (2017), who also reports on a small-scale, game-based learning study performed in the context of New Zealand high school education.

Accordingly, the survey was divided into three sections. The first two sections formed the quantitative data component of the survey. Where the first section used ten items to measure students' perspectives of the learning experience in general, the second section used six items to measure students' perspectives regarding the *Minecraft* environment. The third and final section of the survey generated qualitative data and was comprised of two open-ended questions, which provided the opportunity for students to comment more specifically on aspects of the experience they enjoyed or found interesting, as well as comment on aspects of the experience they disliked.

The survey was performed in class shortly after the conclusion of the game-based learning task and was completed by fifteen of the sixteen student participants (one was absent). The survey was provided to students in a Google Form, which they accessed via a Google Classroom. Prior to completing the survey, the students met with the teacher in a school computer lab where each had individual access to a computer. The teacher then invited students to participate in the survey, provided general instructions about how to access and complete the survey, the importance of answering honestly, and that their responses would be recorded anonymously. The survey process took approximately twenty minutes to complete.

The Reflective Journal. McNiff (2010) states the central purpose of action research is to help teachers transform their practice for the benefit of their students. With this purpose in mind, the teacher kept a reflective journal during project implementation, which was critical towards improving his understanding of how the intervention he put in place was affecting the way students engaged with Greek mythology. The journal was completed and dated on a regular basis during the project and contained six entries that totalled 3700 words.

A typical journal entry was comprised of two components. The first component involved the teacher transcribing field notes made during his observation of students in class. The aim of these observations was to record how students engaged with the intervention and typically involved writing down what he saw students doing or saying in real time, which in turn, provided a stimulus for reflection (McAteer, 2013). The second component involved a reflective entry where the teacher would attempt to situate the field notes in the theory and literature used to inform the project. Entries in the journal followed this structure based on the teacher's preference, which is an acceptable approach in action research and reflects its "intensely personal nature" (McAteer, 2013, p. 5).

The Digital Text. The work students produced in Minecraft was a critical source of evidence for understanding how students were engaging with the learning task and how students were manipulating the *Minecraft* environment towards that end. Given the democratic nature of action research, McNiff & Whitehead (2005) emphasize to teachers the significance of utilizing the views of participants to inform the research and to inform practice. Moreover, in the context of this project, the *Minecraft* artifacts produced by students are expressions of their involvement in the experience that helped inform the teacher's understanding of the intervention. Where the post-experience survey explicitly asks for students to provide their perspectives on their engagement in the experience, their work produced in *Minecraft* provides more objective data that may evidence students' engagement in a more authentic manner.

At the conclusion of the project, the students shared their *Minecraft* worlds with the teacher via the export and import file sharing functions built into the platform. The four images presented in Figure 4, Figure 5, Figure 6, and Figure 7 are screenshots showing aspects of a mythic game a trio of students created. These images were selected by the teacher to illustrate key elements of his observations, clarifying the relationship between *Minecraft*, pedagogy, and students' engagement. The intent was to understand the intervention and further illuminate its complexity through the complimentary power of imagery – rather than suggest that these images represent the totality of work completed by all participants in this regard.

Quantitative Data Analysis. The quantitative data generated by the students' responses to the sixteen items in the post-experience survey were analyzed by aggregating the results across a five-point Likert scale ranging from 1 (strongly disagree*)* to 5 (strongly agree). The Likert scale is commonly used in research practices to measure the attitudes and perspectives of participants. While the survey enabled the participants to have their say and share their views on the project in a sincere and independent way, which is crucial in the

context of action research, the Likert scale was selected as an appropriate approach to the analysis of the quantitative data because it can transform an individual's subjective opinion into an objective measure (Joshi, Kale, Chandel, & Pal, 2015; McNiff & Whitehead 2005). Additionally, the bipolar nature of the Likert scale made it user-friendly and easily understood. This was an important consideration in measuring the views of people who are still relatively young.

Qualitative Data Analysis. One of the central aims of teacher action research is to empower teachers with the means of generating new theory about practice (McNiff & Whitehead, 2005). We consider this aspect of action research significant. Not only does it enable teachers to transform their practice for the benefit of students, but also encourages teachers to contribute new knowledge and ways of delivering innovative practices to the profession in an evidence-informed manner. Accordingly, we adopted an inductive approach to the analysis of the qualitative data, generated by the final two survey questions and teacher's reflective journal. This means that the data generated were coded according to the emergent themes identified by the teacher (Male, 2016). Furthermore, the themes identified across students' responses to the two open-ended survey questions were then quantified and presented via tables (Male, 2016). In contrast, the themes identified in the teacher's reflective journal are summarized and presented in narrative form (McAteer, 2013). Presenting the themes identified in the reflective journal in this format clarifies how *Minecraft* and problem-based learning worked to affect students' engagement.

Results

The Post-experience Survey. The survey results showing students' overall perspectives on game-based learning and *Minecraft* are illustrated by Figure 2 and Figure 3.

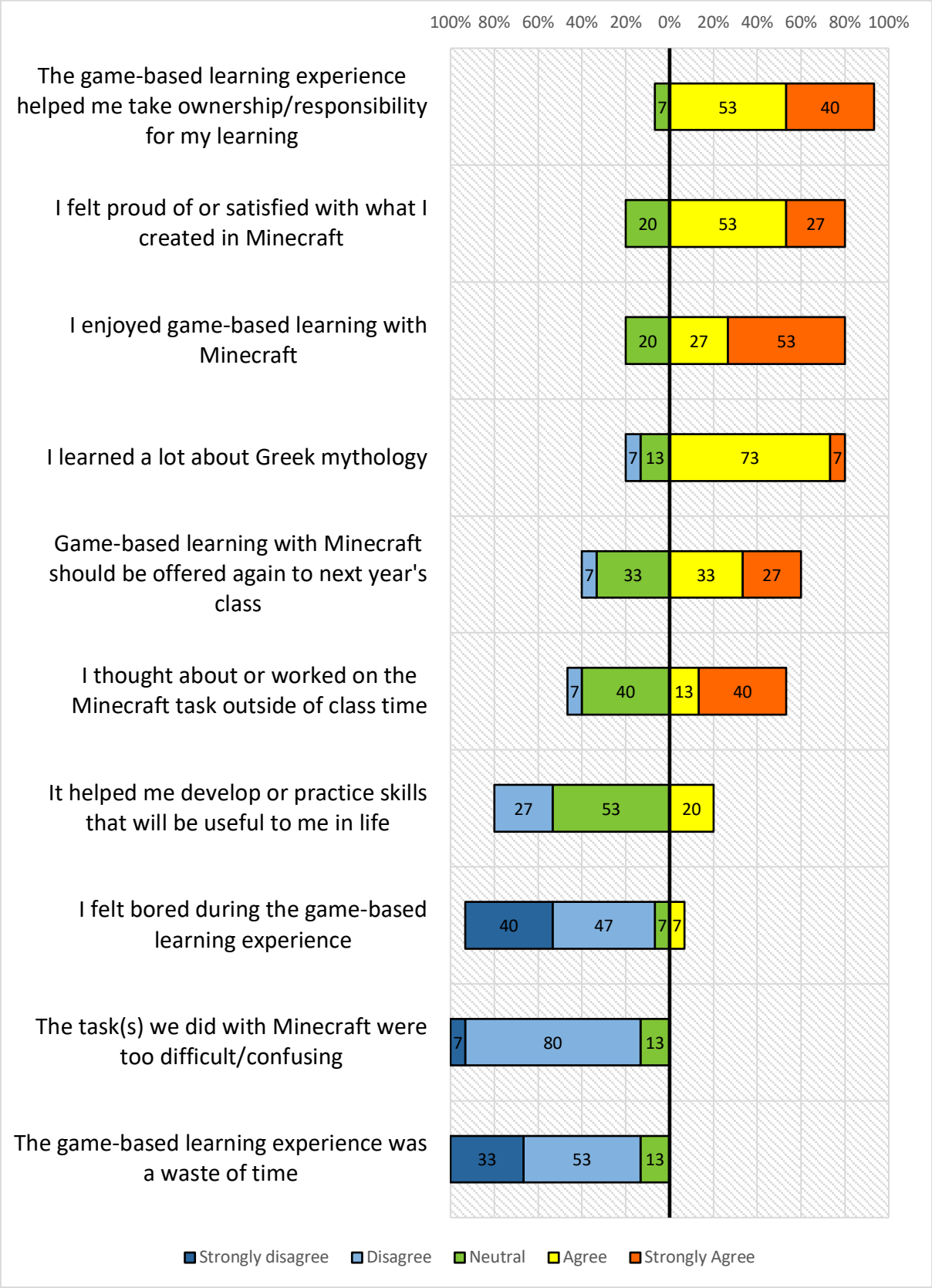

Figure 2: Students' thoughts on game-based learning with Minecraft

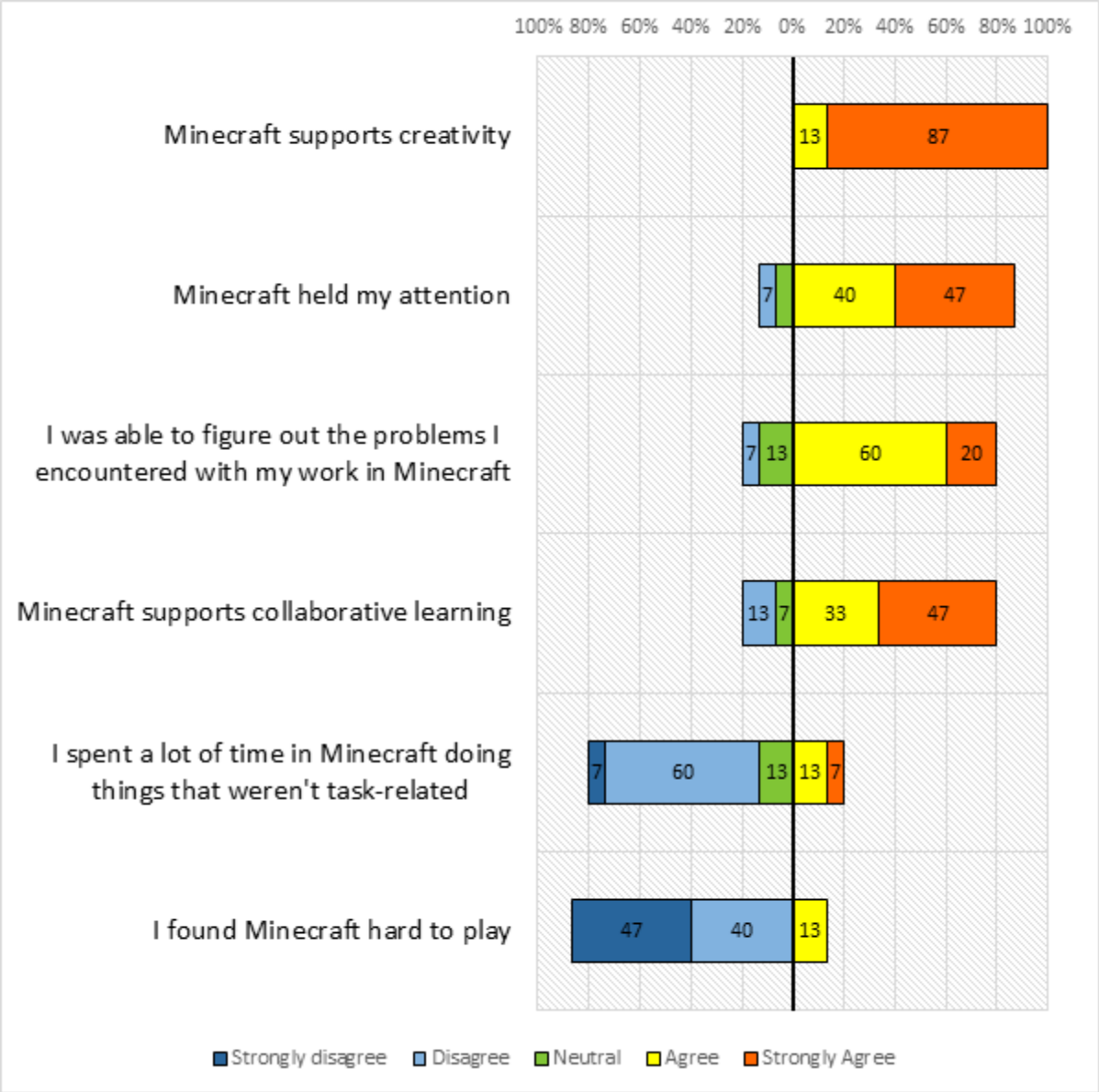

Figure 3: Students' thoughts about Minecraft

The responses indicate that most students found the experience valuable. Nearly all students (14 out of 15) agreed or strongly agreed that they were able to take ownership and responsibility for the learning process while most students (12 out of 15) agreed or strongly agreed that:

- They felt proud or satisfied with their *Minecraft* creations
- They enjoyed game-based learning with *Minecraft*
- They learned a lot about Greek mythology

Most students (13 out of 15) disagreed or strongly disagreed that:

- The task was too difficult
- The experience was a waste of time
- They felt bored during the experience

Most students (9 out of 15) said that the game-based learning experience should be offered again to next year's class (only 1 disagreed).

It was interesting to note that students gave a more diverse response as to whether the experience helped them to develop or practice skills that will be useful in life. Most students (8 out of 15) gave a neutral response to this question while some agreed (3 out of 15) and some disagreed (4 out of 15). However, in contrast, most students (12 or more) agreed or strongly agreed that *Minecraft*:

- Supports creativity
- Supports collaborative learning
- Supports problem-solving

The anomaly presented here might indicate that while students understand learning with *Minecraft* supports creativity, collaboration and problem-solving, they do not necessarily see or understand how these skills might be transferred and applied to different contexts. This might indicate a need for educators to emphasize to students how competencies might be transferred as well as providing opportunities for students to apply this in practice (Voogt & Roblin, 2012).

Finally, most students (13 out of 15) agreed or strongly agreed that *Minecraft* held their attention. Two thirds of students (10 out of 15) disagreed or strongly disagreed that they spent much time in *Minecraft* doing things that were not task-related and most students (13 out of 15) disagreed or strongly disagreed that playing *Minecraft* was hard.

The survey invited students to write comments in response to what they liked or disliked about the experience. In accordance with Male (2016), who recommends quantifying qualitative data, the comments generated by the two open-ended questions of the survey were coded according to emergent themes and are presented in Table 1 and Table 2. A brief explanation of the key themes identified is also provided with some illustrative comments from students.

Table 1: What was the most enjoyable or interesting part of the experience?

Theme	**Number of Comments**
Being creative	4
Personalizing learning	4
Novelty	3
Other	3

Students' responses stressed that having the freedom to explore and act on their curiosity was a highlight of the experience. Having the opportunity to perform the task "in our own way" was commonly reported as an essential aspect of the experience. The following comments are examples of the first three themes:

- "Building and creating the scenes. Being able to adapt and bend to fit our perspective and the game was really fun and made me and my partner use our creativity."
- "I liked that it allowed creativity and let me explore the myth I was studying in my own way."
- "I got to learn some stories from Greek mythology in order for me to create an art. Example, Demeter is goddess of agriculture, it gives me a vision using my imagination creating Demeter's world or how is it look like. The one that I enjoyed the most is that, as I collect data, I tend to look at some stories as well and not just sticking with our topic. I find myself flexible when in this learning experience."
- "Being able to do something less conventional in terms of learning the course material was really interesting."

In other comments, one student said she gained empathy for the ancient context; another commented that she enjoyed the collaborative aspect of the experience. The last comment expressed that seeing the finished product evoked a sense of pride.

Table 2: What did you dislike about the experience?

Theme	**Number of Comments**
Aspects of gameplay	5
Time management	4
Other	1

The following comments illustrate the first two themes:

- "There is a limit to how much you can do with *Minecraft*, especially in limited time."
- "Came across some issues that we weren't able to get around because of the time frame though I was still proud of the final result."
- "*Minecraft* didn't have all the tools I wanted to use (certain animals, inventory items)."
- "The blocks are all cubes so it's hard to make things that aren't square and sometimes it can get a bit tedious when clearing blocks to make foundations or manmade lakes."

- One student remarked that the task was difficult because she felt she was not a creative person.

The Reflective Journal. During the project, the teacher took field notes of a group of three students in their digital game-based learning experience and used these to inform a reflective journal. Upon analysis of the journal, three key reasons emerged that explain how students were engaging with the task. The teacher concluded that *Minecraft* and problem-based learning enhanced students' engagement because it:

- enabled customization of learning;
- improved perseverance and creativity; and
- improved students' sense of achievement and confidence.

For the sake of clarity and providing practical insight, the journal findings are summarized here in narrative form alongside images that show examples of students' work in *Minecraft*.

Students of this project were asked to solve the overarching problem of using *Minecraft* to create an interactive digital text based on a Greek myth. The journey towards solving this problem was predominantly characterized by negotiating a series of *intentionally designed* and *unforeseen* mini problems that accrued during their experience. Understanding the binary nature of problems students encountered when creating myths in *Minecraft* provides valuable insight into how problem-based learning improves students' engagement.

Where Figure 4 displays a bird's-eye view of an interactive digital text created by three students based on the life of the Greek god, Hephaestus, Figure 5 displays the player's point of view at the beginning of this game. Note the colour-coded paths in these two images; each path leads the player to simulations of events that occurred in the life of Hephaestus, such as an encounter with Eurynome and Thetis (as shown in Figure 6). These events equate to mini problems that students designed and solved during their experience, and when viewed in totality, form the solution to the overarching task. What is important to note, is that having autonomy over what mythic events to include or exclude and how these events were to be rendered in *Minecraft* improved students' emotional and intellectual engagement. This is because students would typically include events from myths they found appealing on some level (for example, they found an event humorous, or peculiar). Indeed, the most common reason students cited for their enjoyment during the experience was the freedom to customize the response to the task.

Figure 4: The Fall of Hephaestus

Note. A birds-eye view of a video game based on the life of the Greek god, Hephaestus, produced by three students in Minecraft.

Figure 5: The Opening Scene

Note. The image displays the player's perspective during gameplay of a digital text created by students.

Figure 6: Hephaestus Saved

Note. The image shows the player's encounter with Thetis and Eurynome, the two goddesses who received and nursed Hephaestus after Hera expelled him from Olympus.

Furthermore, when students encountered unforeseen problems during their experience, it placed greater demand on their creativity and improved their perseverance. Figure 7 shows *The Arm of Hera*, a machine the trio built in their digital rendering of the Hephaestus myth. Building this machine presented them with unforeseen challenges. The initial designs went awry, prompting them to engage in a feedback loop that is approximately described as a process of design, create, test, reflect, and repeat until the desired outcome was achieved. During the making of, *The Arm of Hera*, a machine that simulates the experience of Hephaestus being thrown off Mount Olympus for the player, one student commented that her avatar was thrown off the mountain multiple times while the group figured out ways to improve the accuracy of the circuits used to power the pistons responsible for launching the player.

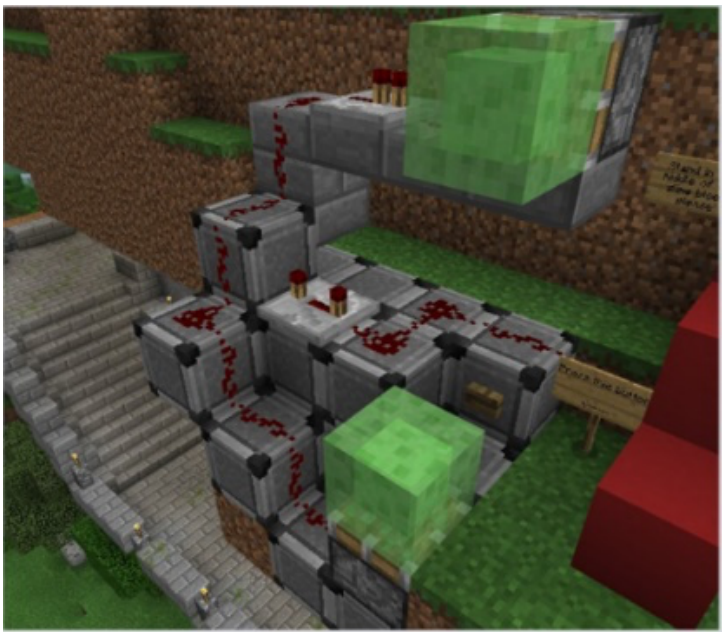

Figure 7: The Arm of Hera

Note. An image of a machine created by students that simulates that act of being thrown off Mount Olympus by Hera for the player.

Moreover, the unforeseen problems that students encountered in *Minecraft* invited students to draw on their imaginations to produce solutions. The vast range of on-demand tools and materials in *Minecraft* enabled students to succeed when faced with the unforeseen problems that arose as these resources supported the practical implementation of ideas that the students wanted to test. The supplementary nature of the relationship between *Minecraft* gameplay and the human imagination enhances students' engagement in problem-solving as it engenders greater creativity and perseverance in the face of challenges then one would normally anticipate from a more traditional approach to this type of text making task.

Finally, students' sense of achievement and confidence improved as a consequence of using problem-based learning with *Minecraft*. Students could act on their curiosity and bring the designs of their imagination into being. This creative process of bringing something intrinsic and abstract into a tangible form, at least visually and in the experiential sense, was associated by the students with a sense of pride and accomplishment. Looking at their finished products was typically cathartic for the students. They felt good about their learning and what they had produced. The combination of pedagogy and *Minecraft* struck an environmental balance that enabled students to produce artifacts that reflected aspects of themselves and their efforts.

Discussion

This project aimed to explore how the combination of *Minecraft* and problem-based learning might support students' engagement in learning about Greek mythology. The results illustrate that problem-based learning with *Minecraft* promotes a highly immersive

environment where students' can act on their imagination and curiosity meaningfully and demonstrate their understanding of Greek mythology in ways not possible in the physical space of the traditional classroom environment. Notably, problem-based learning with *Minecraft* enhances freedom of expression as students can practice and develop creativity and express their individuality through designing and solving challenging problems in customized ways, which improves their commitment to, and enjoyment of learning mythology. Students of this project were able to actively engage in the learning process to construct an experience according to their personal goals and learning preferences. Therefore, the findings resonate with Gee who states, "Good video games allow players not just to be passive consumers but also active producers who can customize their own learning experiences" (2003, p. 194). Simply put, what students thought and what they chose to do mattered and this improved their engagement because they felt empowered. Given the global contemporary trend encouraging educators to adopt more technology-enhanced, student-centred learning practices, the results of this project attest to the combination of *Minecraft* and problem-based learning as one viable, and promising solution (Scott, 2015). The beauty of such a combination is that it can be used by teachers across academic disciplines and sectors; its utility is not limited to the field of Classical Studies.

Where the efficacy of digital game-based learning is concerned, the pedagogical findings agree with the sentiment put forward by experts like Prensky (2010), Van Eck (2006), and Kiili (2005) who advocate a need for educators to deploy video games in the classroom. One of the most valuable outcomes of the project was in defining the mechanics of, and inner workings behind, the nature of problems students solve when using the *Minecraft* environment. Kiili states: "Games provide a meaningful framework for offering problems to students. In fact, a game itself is a big problem that is composed of smaller causally linked problems" (2005, p. 17). On that note, the results of this project contribute further knowledge that defines how and why problem-based learning in *Minecraft* affects engagement. Where the nature of problem-based learning was originally hidden and ambiguous, the emergent nature of the action research process enabled the teacher to reveal knowledge that clarifies how the relationship between problem-solving and *Minecraft* might produce an engaging learning experience. Such clarification might encourage other educators to see *Minecraft* as a viable platform to deploy in the classroom.

When using *Minecraft* in practice, this project highlights that it is essential for teachers to think about how education theory and pedagogy can inform the design of the learning task. One of the strengths of the project that helped facilitate students' engagement was the cohesion between constructionism, the pedagogy of problem-based learning, and *Minecraft* (Hmelo-Silver & Barrows, 2006; Papert and Harel, 1990). The unity between theory, pedagogy, and technology provides a foundation that drives students' learning experiences. Indeed, this recommendation reflects Karsenti et al. who state that teacher use of *Minecraft* should be "supported, educational, and purposeful" (2017, p. 27) as well as Craft (2016) who successfully utilized socio-constructivism to design and inform the learning activities his Latin students engaged in with *Minecraft*. While it might appear to be common sense to suggest teachers implement *Minecraft* through established theory and knowledge, it is important to emphasize that *Minecraft* is an emerging technology whose potential is not

fully realized in classroom practice. By binding *Minecraft* in this way, teachers can take informed pedagogical risks that are more likely to yield outcomes that could lead to sustainable innovations.

The results of this project endorse the views of Marcon (2017) and Craft (2016) regarding the efficacy of Gee's (2003) game-based learning principles in supporting teachers' understanding of how they might take advantage of *Minecraft* in the classroom. Given Gee's (2003) influence on these smaller classroom studies that use *Minecraft*, there is a temptation to simply conclude that his principles are generic, but rather, the reason these studies found his work meaningful is because it bridges the divide between two worlds: the world of the classroom teacher and that of video games. While Gee's (2003) principles are general insofar as they are abstractions he derived from thinking about his experiences with "good" video games and integrating those experiences with his knowledge of how people learn, they have teeth; they carry immense practical utility and can support innovative practices with *Minecraft*. For example, where Craft (2016) found the cyclical element of Gee's (2003) principles useful for embedding his students' learning of Latin (content) in the *Minecraft* environment, this project found the cyclical element of Gee's (2003) principles as a useful mechanism in supporting students' creativity and problem-solving (competencies). The divergence in outcomes that the application of Gee's (2003) principles can produce is highly desirable in the current climate of education where innovation is a priority (Scott, 2015). There is little doubt that Gee's (2003) game-based learning principles can continue to assist teachers and researchers in further illuminating the potential of *Minecraft* to support dynamic learning opportunities for students.

Though this project is primarily concerned with enhancing student engagement, the survey results unexpectedly revealed a discrepancy in students' understanding of the competencies their *Minecraft* experience supported (for example, in creativity and problem-solving) and how these competencies might be relevant to their lives. Given that the future job market is likely to place greater value on creativity and problem-solving and that being able to create artifacts with technology is an important component of maintaining one's individuality in a digitally sophisticated society, the next iteration of this action research will seek to address this issue by deploying *Minecraft* and problem-based learning in an interdisciplinary project (Ito, 2009; Microsoft and McKinsey & Company's Education Practice, 2018; Voogt & Knezek, 2018). It is envisaged that such a project might enable students to see how skills in creativity and problem-solving can be transferable between contexts, and therefore, more valuable, and relevant to their lives.

Conclusion

At its core, this project explored how a teacher could deliver to students an innovative way to engage with Greek mythology. The results showed that problem-based learning with Minecraft is highly engaging and useful towards cultivating individuality. Most students found the experience enjoyable and valuable. It enabled them to make and actualize decisions about their learning and to solve problems creatively and independently through making task-related artifacts in the Minecraft environment. Given that competency

development and personal responsibility for learning are important towards preparing students for a dynamic future (Microsoft and McKinsey & Company's Education Practice, 2018; Scott, 2015; Voogt & Knezek, 2018; Voogt & Roblin, 2012), the approach offered by this project provides a useful schematic for teachers looking for such additions to invigorate the curriculum.

Whether or not students gained a deep understanding of Greek mythology during the project was not a focus of this research, but is an obvious and important question that needs an answer – for teachers may not wish to sacrifice quality of learning for the sake of enhanced student engagement. Clarifying this relationship could provide a more convincing basis for teachers to see Minecraft as a powerful educational tool. Though Craft (2016) illustrates the potential of Minecraft to support academic rigor in learning Latin, it is recommended that future studies build upon this by examining how Minecraft might support academic progress in learning different aspects of Classical Studies, especially in relation to other proven methods.

On a final note – and perhaps most importantly – we conclude that, when harnessed through careful pedagogical consideration, the Minecraft environment enables Classical Studies teachers and their students to breathe life into the ancient world in an appealing, virtual form. In binding the old with the new through pedagogical design, this project, though small in scale, helps describe the face of progress in the contemporary Classical Studies classroom.

About the Authors

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"NOT ONLY WERE THE STUDENTS LEARNING … BUT SO WAS I": INTRODUCING PRESERVICE TEACHERS TO GRAPHIC NOVELS AS PART OF A MULTIMODAL LITERACY FRAMEWORK

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Abstract Researchers have found graphic novels to be effective teaching tools to improve both traditional and visual literacy skills. However, preservice teachers (PSTs) report feeling hesitant and/or unprepared to integrate graphic novels into their future classroom curriculum. The purpose of this qualitative pilot study was to understand what supports PSTs need to feel prepared to integrate multimodal texts with students, if experience using graphic novels as teaching tools could expand PST's thinking/understanding of multimodal texts as a teaching tool, how PSTs can use graphic novels as a teaching tool to promote authentic writing opportunities, and what challenges PSTs face when incorporating graphic novels into the curriculum. This action research study took place as PSTs worked with elementary-aged students as they participated in Enrichment Clusters, a school-wide initiative designed to explore an area of interest for the students outside the standard curriculum. Participant reflections indicate that PSTs gained significant experience and confidence with graphic novels from having an opportunity to utilize them to teach writing skills to a diverse classroom of learners. While this was designed to be a pilot study followed by a larger subsequent study, the follow-up research took place in the spring of 2020 and was cut short by the COVID-19 pandemic.

Keywords: teacher action research, preservice teachers, preservice teacher education, graphic novels, literacy, multimodal literacy, new literacies

Introduction

A recent International Literacy Association's (ILA) *What's Hot survey* (2018) highlighted a gap between the "importance and attention" given to teacher preparation (p. 13). This biannual survey was sent out to 1,600 literacy professionals and asked them to rank 25 trending literacy topics to better understand the issues most important to high-quality

literacy instruction. According to the results, *Teacher Preparation* was only listed twelfth among the hot topics; however, it received a remarkably high ranking of third in overall importance by the same respondents. ILA (2018) maintained that this response reflected "respondents' views that new teachers often enter the classroom without the skills needed to foster literacy success" (ILA, 2018, p. 7). These are troublesome statistics for those of us involved in preservice teacher (PST) preparation, and for PSTs themselves. Teacher educators must increase their focus upon integrating current literacy methodologies into the curriculum.

Researchers have heralded the importance of expanding PST's existing views of literacy to include more multimodal texts and practices (Albers, 2006; Block, 2013; Clark, 2013; Cook & Sams, 2018). Multimodal literacies involve the study and understanding of language utilizing multiple modes of meaning (Mills & Unsworth, 2017). Education has traditionally been dominated by two modes of communication--text and speech. However, the world students must learn to navigate requires more flexibility in communication. Students need exposure to multiple modes of communication within their classrooms if they are going to successfully negotiate those same modalities outside of the classroom. According to the National Council for Teachers of English (NCTE), multimodal literacy instruction should become an "increasingly important component of the English/Language Arts (ELA) classroom" (NCTE, 2005, p. 1). Modern society is increasingly visual, and teachers have felt the need to foster new approaches to teaching reading that will help their students better navigate the expanding literacy demands of our highly visual culture (Luft, 2019).
A prevalent type of multimodal literacy platform that has continued to increase in popularity is the genre of graphic novels. Graphic novels are written and illustrated in the style of a comic book but resemble a novel in both length and narrative development (Scholastic, 2018). These novels seem to have struck a chord with young readers. In 2012, school librarians were interviewed and noted that there was a discrepancy in their graphic novel holdings, such that graphic novels accounted for approximately 40% of their overall circulation, but they made up less than 5% of the entire library collection (Lapp et al., 2012). In 2019, not only were two graphic novels (*Guts* by Raina Telgemeir and *Dog Man #7* by Dav Pilkey) at the top of the best-seller list in their first week of release, but young-adult oriented graphic novel titles for readers 6-18 were up 39% in bookstores nationwide (Salkowitz, 2019). Furthermore, graphic novels have continued to increase in popularity so much that the American Library Association declared July as Booklist's *Graphic Novels in Libraries* Month (American Library Association, 2019).

Not only are graphic novels popular amongst readers, but researchers also find them to be noteworthy. For example, Mathews (2011) asserted that illustrations in graphic novels serve to scaffold struggling readers, engage reluctant readers, and enrich successful readers. It is no surprise, then, that Syma and Weiner (2013) posited that it is inevitable that graphic novels should be used for education, all that remains is "how to use [them] and for what purpose." Yet, as Lapp et al., (2012) stated, "while graphic novels may be 'hot' among their readers and, as these data showed, also among many teachers, their use in the classroom is not as 'hot'." With so much evidence of the popularity of graphic novels among readers, librarians, and researchers, what is keeping graphic novels out of ELA curriculum? Although

researchers have established the need to infuse multimodal literacy instruction into the classroom, the inclusion of these topics is seemingly scarce in PST coursework (Cook & Sams, 2018; Jimenez and Meyer, 2016; Yusof, Lazim, Salehuddin, Shahimin, 2020). Further, Mathews (2011) noted that "until graphic novels become legitimized forms of knowledge within educational institutions, teacher educators must help preservice teachers foster the agency to critically examine these curricular materials."

With these inconsistencies in mind, our research team explored these questions specifically within the framework of undergraduate education to better understand how to include multimodal literacy instruction into the ELA curriculum. This action research study examines the support that preservice teachers (PST) will need as they use graphic novels as teaching tools. To better evaluate the needed supports, we, as literacy education researchers, conducted an action research pilot study that examined the ways in which PSTs could use graphic novels as teaching tools within a local elementary school. An action research methodology was chosen for its relevance to PST participants and its potential to empower them to incorporate graphic novels in their future classrooms.

With this pilot study, we attempted to answer four questions:

1. What support do PSTs need in their coursework to help them to feel prepared to integrate multimodal texts with students?
2. Does the use of multimodal texts, such as graphic novels, push PSTs to expand their thinking/understanding of multimodal texts as a teaching tool?
3. How can PSTs use graphic novels as a teaching tool to promote authentic writing opportunities with young students?
4. What were the most challenging components in using graphic novels to provide authentic multimodal text teaching opportunities for PSTs working with a variety of young writers?

Literature Review

Multimodal Literacy. Kress (2003) has emphasized that regarding print-based literacy as the chief representative force in terms of conveying meaning is too restrictive and does not take into account other equally important modes of representation such as "gestures, speech, image, writing, 3D objects, color, music, and no doubt others" (p. 36). Whereas text-only literacy is one-dimensional, multimodal literacy is multifaceted. Multimodal literacies are texts and practices that include more than just written text, rather they extend meaning into a variety of modes of representation (Jewitt & Kress, 2003). In multimodal literacy, every facet of a given text or practice is conveying meaning to the reader; for graphic novels, this has resulted in a shift from written text being the main source of meaning, to images carrying equal or greater importance (Lutkewitte, 2013). Meaning, then, is made from all of the intersecting modes, which are conveyed through a variety of mediums. To be literate in a world that utilizes a variety of written and visual modes of communication necessitates development of the skills required to read a variety of modes fluently.

Therefore, twenty-first century ELA classrooms are increasingly advised to incorporate multimodal literacies into instruction (Cook & Sams, 2018; Connors, 2010; Fisher & Frey, 2007; NCTE, 2005). In fact, as recently as 2016 and 2018, NCTE recommended that students demonstrate their knowledge via various multimodal platforms to further develop their literacy skills. Researchers have found support for redefining and reconceptualizing literacy instruction so that 21st-century students are better prepared to communicate meanings via and across varied texts (Gavaldon-Hernandez, Gerboles-Sanchez, & Saez de Adana, 2017). As educators continue to advance their instructional goals and techniques, they must find relevant methods for incorporating multimodal literacy into their curriculum.

Graphic Novels. One form of multimodal text which can be used within a variety of K-12 ELA curriculum frameworks is the graphic novel. Populations as diverse as gifted students, struggling readers, elementary students, secondary students, and EL students have benefited from the use of graphic novels as educational tools (Bakis, 2012; Carter, 2007; Chun, 2009; Howard, 2012; Huh & Suh, 2015; Ranker, 2007). Not only are graphic novels beneficial for diverse learners, but also for diverse learning goals. Researchers have determined graphic novels promote literacy, reading comprehension, story writing, and language learning (Brenna, 2013; Carano and Clabough, 2016; Cook, 2017; Walsh, 2017). In a recent International Literacy Association (ILA) blog, ILA author and ELA coordinator Susan Luft (2019) stated that "learning to read the elements of art in graphic novels gives students experience with visual literacy in a way that is engaging and builds meaning" (p. 3). Graphic novels are engaging tools that give students exposure to visual literacy and novel ways to encounter meaning in texts. (Luft, 2019). In addition to literacy instruction, the potential for graphic novels as tools for writing instruction is promising. According to Roll and Vaughn (2019), students are infrequently provided with authentic writing opportunities during their writing instruction. As opposed to contrived essays or short narratives to be viewed only by the student's teacher, student-generated graphic novels provide an authentic writing context by allowing students to act as author and illustrator.

PST attitudes toward graphic novels. While the potential of graphic novels as instructional tools is well established, their use in the classroom is still limited as graphic novels may not regularly be included as part of the ELA core curriculum. Researchers have identified a number of potential obstacles to PST's willingness to incorporate graphic novels into their future curriculum, ranging from unfamiliarity with the genre, general lack of curricular options, or its use with diverse learners, to concerns about genre credibility (Clark, 2013; Cook & Sams, 2018; Lapp et al., 2012). One of the more significant of these barriers is the lack of familiarity with graphic novels among PSTs. Rust and Cantwell (2018) discussed the need to provide scaffolded supports to PSTs within their coursework, as they were often learning about the nuances of graphic novels alongside the students they were instructing in a field-based literacy class for PSTs. In fact, according to a study conducted by Block (2013), only 15% of PSTs included in the study had received exposure to graphic novels during their PST training and it was described as brief to very brief. When this unfamiliarity with the graphic novel genre is combined with their infrequent inclusion in current curriculums, it is unsurprising that PSTs are hesitant to introduce graphic novels into their future classrooms. Further, according to Matthews (2011), PSTs need explicit guidance in learning how to

question and use graphic novels as curricular materials. This study was conducted with that recommendation in mind.

Methodology

Participants, setting, and procedures. To explore PST use of multimodal texts, such as graphic novels, we conducted a pilot study in a local elementary school which was located in the downtown area of a mid-sized metropolitan city in the midwest. During the spring 2019 semester, thirteen PSTs participated in a service-learning project where they worked with a small group of students as those students created their own graphic novels. As a course requirement in one of their university classes, participating PSTs volunteered for at least five one-hour Enrichment Cluster sessions over a ten-week period and attended the Enrichment Cluster Showcase held at the school at the completion of the Clusters period. PST participants took weekly field notes and wrote formal reflections at the culmination of the project, which served as the primary sources of data for this research.

Enrichment Clusters. The goal of an Enrichment Cluster is to set aside regular instructional time during the school day to direct all students in the creation of a product, performance, or service for an authentic audience in order to deepen their understanding of a particular topic. Participating elementary students were in grades 1-4 and had expressed interest in creating a graphic novel. In our cluster, Creating Graphic Novels, PSTs helped elementary-aged students explore popular graphic novels. These were used as mentor texts, or models, to help the students as they created their own graphic novels. PSTs met at the participating elementary school once a week on Friday afternoons. The Enrichment Clusters took place during the regular school day so that all students in the school could participate. The weekly action research team consisted of one professor who facilitated the project, five to seven PSTs that rotated regularly, and a consistent group of elementary students (N = 15) of mixed ability, age, gender, and race. PSTs were both excited and nervous at the start of the project. PSTs reported limited experience with the graphic novel genre and for many PSTs this was their first time working with students in an unstructured way; Enrichment Clusters were purposefully designed to be student-led by the elementary-aged participants. As a group, the PSTs brainstormed and had a general plan prior to each session, yet they let the students guide the sessions as they explored ways to scaffold and support participants as they created their graphic novels. During the first couple of meetings, elementary students were given time to read from a selection of graphic novels and began discussing goals for their final product. Most students decided to create their graphic novel on their own, but two students opted to work as a team. Over the next few sessions, students were given time to begin brainstorming ideas. The next step in the graphic novel creation process was for PSTs to help the students think about character and plot using graphic organizers. Both blank paper and blank comic panels of varying styles were made available for the students to begin the drafting and drawing process. Most of the students chose to hand-draw their novels, but a handful of students used graphic novel apps on tablets. Throughout the sessions, PSTs worked with their students as they created their graphic novels. As the project concluded, the students were encouraged to create cover pages and their graphic novels were assembled in presentation folders, using either their hand-drawn pages or

printed pages from the tablets. The graphic novels were then displayed for the Enrichment Cluster Showcase. PSTs were present for every step of the process to facilitate the project and provide support as needed.

Technology Integration. One idea that emerged throughout the early weeks of the project was the integration of technological apps on tablets. PSTs took ownership of this process as well. A few PSTs led and organized the "tech table." At the tech table, elementary students were introduced to a few apps: Superhero Comic Book Maker, Seedling Comic, and Sketch Book. The PSTs that led the table became quite knowledgeable and there were a few elementary students that preferred creating their stories almost exclusively with the apps. However, only about a third of the elementary students preferred this modality.

PST support. This was a new Service-Learning Project and was the first time that the PSTs had participated in Enrichment Clusters so they were learning as they went through the process. We emphasized ongoing reflection throughout the project and PSTs largely guided the direction that the project would take. First, PSTs began with an informal introduction to graphic novels and how to read them. An introductory Scholastic (2018) guide used within the PST university class discussed how graphic novels supported student learning and provided some insight on how to use them within a classroom. PSTs were provided time weekly within their university class to plan and discuss what they wanted the elementary students to do during each session. Each PST worked with a small group of students each week. Some PSTs worked with the same group for the duration of their participation, however, several PSTs worked with a variety of student groups based on when they were attending. Some PSTs were able to complete their five sessions back-to-back, but most participated more sporadically based upon their personal schedules.

Enrichment Clusters were designed to be student-led on the part of the elementary aged participants, so while PSTs had a general goal in mind to accomplish weekly within their small Enrichment Cluster group, it was very unstructured and varied considerably from group-to-group. For the first session, PSTs decided that they would have their elementary students read novels with them to increase familiarity with the genre and point out textural details such as the ways in which authors conveyed the storylines through text and images. The PSTs had a variety of graphic novels they brought to each Enrichment Cluster session to use for reference. Each PST also administered an informal inventory of student interests while reading and discussing the books with the students. Each PST asked the elementary students questions designed to better understand their previous story writing experiences, story writing interests, and what writing supports students might need. Immediately after the first cluster session, the researchers and PSTs held an informal discussion about what PSTs had learned while working with their elementary students. PSTs also brainstormed goals for the next weekly session. These discussions were shared with the larger group during the next university classroom session and were where the bulk of continued planning took place from week to week. It was truly a group effort and the PSTs were involved with the design of the project throughout the cluster sessions. They continued this process throughout the project.

After a few sessions had been completed, participating PSTs realized they wanted a way to communicate individual student progress to the PST who would be working with the student(s) the following week. A sticky note system was decided upon by the PSTs wherein at the end of each session, the PST would write a brief explanation of what the participating student had worked on that day to facilitate a seamless process for students regardless of the week's group of participating PSTs. Once implemented, sticky notes were left weekly in the students' writing envelopes and provided a summary for the next PST to read.

Data Sources and Analysis. As part of the course, PSTs were asked to write a reflection on their Enrichment Clusters experience. These reflections were the primary data source. We also collected field notes. However, these were not standardized, and the depth varied considerably, so we did not use them in our final analysis. We used an inductive analysis approach to search for patterns or themes in the data collected (e.g., field notes and reflections). First, we selected significant statements from the reflections in order to horizontalize the data. As patterns emerged, we generated a thematic codebook which helped highlight relationships and connections in the data. The process continued until all reflections were analyzed and coded, and then the process was repeated independently by each researcher. Once all statements had been coded again, we met and discussed the data to ensure consistency. We explored any conflicting statements/codes, and any new codes were added to the thematic codebook. This process helped us ensure that all the themes had been explored fully and added depth to our understanding. Summary charts were created for each participant, organized by the overarching research questions. Once the summaries were completed, resulting patterns were identified to address the overarching research questions.

Results

Through this project, we examined how PSTs used multimodal text platforms, such as graphic novels, successfully with learners of differing levels and abilities. This was the first time our university had participated in this service-learning project, so we looked at it as a pilot study designed to be modified and expanded the following year. The follow-up study was initiated in the spring of 2020 but was cut short due to schools closing during the COVID-19 pandemic.

Multimodal Texts as Teaching Tools. Many of our PSTs knew little about the graphic novel genre prior to starting this project. In fact, one PST commented that "before this semester I had very little knowledge about graphic novels and how successful they can be with readers. So not only were the students learning during clusters but so was I." This was an interesting statement and illustrated the fact that graphic novels were teaching and learning tools for both our PSTs and the elementary students we worked with. Several PSTs noted high levels of student engagement. One PST commented, "I really enjoyed letting them express themselves in a way that they probably never thought possible." Another said:

> the thing I enjoyed the most was seeing how excited the students were about reading or sharing their graphic novels and how insanely creative they were… you can see how engaged the students are when they have choice like that. It certainly

> appeared that the students were intrinsically interested in creating their own graphic novels.

An additional finding was that PSTs made connections between this project and how the knowledge gleaned can inform other areas of instruction, including creating a more complete understanding of their learners' specific needs. For example, one PST stated, "the process of creating something, and using multiple mediums to do so, is perfect for tailoring the project to a student's needs in the classroom." Another said, "I was able to realize that each student learns and focuses in different ways and so I had to figure out the best ways for helping them accomplish their desires regarding the project." Participation in the project helped PSTs understand their learners in a broader sense.

Graphic Novels as Authentic Writing Tools. Graphic novels provided a diverse platform for our elementary students to share their own creative ideas. One PST commented that "students had a lot of fun working on their novels and I have been impressed with the range of ideas we saw, from the completely original to the fan-fiction and everything in between." Another commented on the array of unique ideas, saying "no two stories were even remotely alike in style, content or subject. We had such a wide variety and I think some kids really had fun bringing their thoughts and dreams to life during clusters." Some of the elementary students had many ideas that they wanted to share, and PSTs worked to guide them in narrowing their topics. One offered "some students had so many unique ideas we had to actually make them focus down on one, or three." While PSTs guided, they were hesitant to do more than offer an opinion. One PST stated that "the student has control over their creative processes, which is important obviously for their developing creativity, but also for the strengthening of their confidence and individuality within the classroom setting." The elementary students' graphic novels were authentic texts that did not have to follow any pattern or adhere to any particular topic. Students were free to be as creative as they wanted, and they rose to the occasion. One PST commented that "every student got to be creative at their own academic level, and we, as cluster leaders, got to see them share their hearts on the paper."

Some students opted to collaborate to write a joint story; however, most wrote individual tales. One of the cluster leaders of a writing duo commented:

> By allowing each child a choice in creative manifestation, one is opening doorways for collaboration among the students, exploration in new artistic mediums, and allowing for complete freedom of imagination, something that is so rare in most classrooms today...both boys I worked with wrote, illustrated, and collaborated on a two-part graphic novel that made sense to them. The sense of ownership that the elementary students exhibited was visible.

Challenging Components to Teaching with Graphic Novels. While the knowledge gleaned through the Enrichment Clusters project was immense, there were certainly challenges we faced. One of the biggest obstacles most PSTs discussed was organization. As one PST pointed out, "something unique to [clusters] is that since no one except Dr. Delgado Brown went every time, we had to communicate well together in order to keep the class on the

same page." While we had weekly debriefings from the beginning, PSTs decided that we needed more information on each of the individual elementary students which provided the impetus to create the sticky-note system where they left notes for each other. One PST stated that "once we implemented the system of leaving sticky notes for updates, the process of clusters went much smoother."

Another challenge was working with a range of children across multiple grade levels and of varying abilities. Some of the cluster students had already received some formal writing instruction as a regular part of their schooling, but many of the younger ones had not. One PST pointed out that could be a great benefit to some younger students because of the early exposure, noting "some of them didn't understand the drafting process, but at least we introduced the idea so that it won't be a completely new idea when they learn about it in school." However, some of the PSTs recognized that the broad range of levels left "some students thinking their stories were less than when they [had] mainly pictures compared to a 4th grader who had sentences."

Finally, using technological applications presented its own set of challenges. Students were very excited to try out the applications, but less than a third opted to use them regularly. One PST that regularly worked at the tech table noted that:

> The interest in using the apps really tapered off as the cluster went on and I wonder how much of that had to do with the fact that students had to experiment with [the apps] in shifts, so while they weren't using [the apps] ...they were working on their stories in a paper format and the iPads just seemed like a novelty unless they REALLY connected with them.

Our tech ratio was 2:1, so it did pose some issues that there were not enough iPads for each participating elementary student. Also, there were some creative differences noted by some PSTs, especially with our one writing duo. Another PST noted that one of their writers "was easily distracted by the features of the iPad...but in the end, it did not hinder his overall process." Overall, PSTs who worked with students at the tech table had positive experiences, but the majority felt that we should have started using the iPads sooner.

Discussion

Generally, the Creating Graphic Novels Enrichment Cluster successfully introduced PSTs to graphic novels as a literacy tool. In their reflections, several PSTs discussed what they discovered about using graphic novels as teaching tools, one offered that they "learned more than I could have imagined about graphic novels." To successfully facilitate student writing, PSTs had to guide students explicitly through the process. As a university class, we discussed ways to do this. We utilized graphic organizers and story maps to help break down the brainstorming and idea generation process. PSTs also learned about engaging students by offering autonomy and the chance to explore their own interests. One offered that the elementary students "came in with a positive attitude and were so happy to be there with us working on something they actually wanted to work on." Another said, "they learned

about their lives and why they have such a strong passion for graphic novels." Engagement is a powerful teaching tool that PSTs need in their toolbox prior to teaching.

Exploring how to differentiate and make accommodations were other aspects that many discussed, one offered:

> The most important thing I will take away from this experience is that every student is unique in their interests, in the way they learn, and in how they interact with their learning environment…this was the perfect hands-on learning experience for how to differentiate instruction...

Another surmised they "got a crash course type of experience realizing that the students are more alike than different." In their coursework PSTs are exposed to the fundamental ideas of differentiation and how to make accommodations for students, but this project gave them the opportunity to differentiate for every learner. Most of all, PSTs learned a lot about themselves as future teachers. One commented that they found the project interesting because they felt it helped them "prepare for the reality of a classroom of varied abilities."

Limitations

This service-learning project took place in a setting where all elementary students had chosen to participate in this specific Enrichment Cluster. Said students were very engaged across the weeks of our cluster session likely due to their ability to select to participate in this cluster. As far as the use of technology, we were limited in our student: device ratio (2:1). The elementary school itself did have Chrome books that children in some grades could use (3rd grade and up). However, we did not have those at our university. To adequately prepare for using the technology, PSTs need to be able to practice with the devices. Another limitation was that the PSTs rotated weekly due to their own schedules so that the elementary students worked with several PSTs over the course of the sessions.

Implications

Our classes participated in Enrichment Clusters again in the spring of 2020, however, our cluster participation was cut short due to the COVID-19 pandemic. Thus, these suggestions remain viable options we will consider implementing in future iterations of this project. Our goal was to incorporate a more systematic way to communicate weekly about each elementary student and where they are in their graphic novel generation. While we ended up developing an effective sticky-note system where each PST left notes for each other in our pilot study, this next semester we will be more overt and have a standard form where PSTs specify what they worked on and will give a suggestion on where to start during the following session. We will have a tentative timeline calendar as well. This was another suggestion that came from the PSTs, where they specified that it would help both themselves and our elementary-aged students to have a general idea of where students should be at various checkpoints. Several PSTs commented that the use of the technology applications was a bit distracting for the writers for various reasons, but the consensus amongst the PSTs was that if the technology applications had been introduced earlier that it

would likely have been more seamless. As a result, we will have a schedule where all the elementary students rotate through the technology applications earlier in the graphic novel-writing process. Finally, as Jones (2016) pointed out, it is helpful for improving instructional practice if PSTs read graphic novels themselves before teaching with them. Thus, we will be requiring PSTs to each read and/or explore a graphic novel prior to starting the Enrichment Clusters. This will familiarize PSTs with the graphic novel genre as a reader.

Conclusion

One of our main goals with this research was to determine what supports PSTs need to feel prepared to integrate multimodal texts with their students. We found that PSTs needed explicit guidance on both graphic novels and how to use them with students. In order to use them effectively, they had to first understand the platform. Many PSTs had limited experience with these novels themselves before participating in this research. One way to do this would be to provide systematic instruction on graphic novels as a teaching tool, offering guidance on how to integrate them into their teaching.

Secondly, we were interested in determining if PSTs use of multimodal texts, such as graphic novels, would expand their thinking/understanding of multimodal texts as teaching tools. Many reported throughout the study that not only did they learn how to use graphic novels as teaching tools, but that they were learning alongside their students. As researchers, we noted that graphic novels provided an engaging platform for both the elementary-aged participants, but also as an engaging teaching tool for our PST participants.

Throughout the study, PSTs used the student-generated graphic novels as teaching tools. PSTs indicated that students were excited to write and share their creativity as they crafted their graphic novels. Each elementary student participated in creating their own graphic novel story.

Finally, as far as challenges that PSTs faced when incorporating graphic novels into the curriculum, we noted that organization, consistency, understanding how to work with a variety of different aged students, and how to best integrate technology/deal with limited technological resources were the main challenges faced. While these challenges are not unique to this study, most PSTs will not work with a variety of different aged students, at once, in one classroom. However, the challenges they faced were discussed in class during our weekly debriefing sessions, and each were relevant concerns in their own right. Reflecting on how each of these challenges can impact their teaching was a great experience.

About the Authors

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