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Promoting Effective Language Development In English Language Learners Through A School Garden-Based Curriculum

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PROMOTING EFFECTIVE LANGUAGE DEVELOPMENT
IN ENGLISH LANGUAGE LEARNERS
THROUGH A SCHOOL GARDEN-BASED CURRICULUM

by

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A capstone submitted in partial fulfillment of
the requirements for the degree of Master of Arts in Teaching.

Hamline University

Saint Paul, Minnesota

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DEDICATION

This work is dedicated to the countless English Language Learners who have struggled through non-ELL-specific classes with their greatest attempts to understand the content being presented and have put forth their best efforts regardless.

Thank you. Your experience and hard work have not gone unnoticed.

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CHAPTER ONE

INTRODUCTION

Education for English Language Learner (ELL) students varies based on many factors, from the teacher, to the location of the school, to the school's resources, and beyond. Some of the best practices when it comes to ELL students is the use of hands-on techniques that promote full engagement of the learner in the task at hand, which is why the question I'm choosing to pursue is: how does interacting with a school garden-based curriculum promote more effective language development for ELL students? This chapter outlines my own story as to how I became a teacher, and part-time farm educator, which led to the desire to integrate farming and gardening educational models with English Language Learner education to benefit the ELL population.

I am currently an ELL teacher at a K-6 charter school in the Midwest that serves students from high-poverty areas of the city and has an ELL population of roughly 30%. I am in my second year of teaching, but I am coming into this project with an extensive background in work with students and families who come from underprivileged backgrounds with limited access to resources. It is one of my deepest honors in life to work with this specific population – those who've come up against societal barriers by no

fault of their own, and consequently must work more just to achieve at the same level as their more automatically privileged peers. Injustices exist in many of our systems in the United States, and education is no exception. My hope is that my project can help break some of the most basic of barriers for these intelligent, hard-working, culturally diverse, and linguistically rich students.

The question I am studying is how does interacting with a garden-based hands-on curriculum promote more effective language development for ELL students? I believe that by giving these students the language to interact with objects they can touch and feel, they will be able to pick up the English language with much more efficiency and engagement. An added benefit of teaching with a gardening focus is that inner-city students who are generally isolated from the vast resources of fresh food will see where their food comes from and how it gets to them. In turn, these students will better understand the global perspective that is connected to farming and gardening, while simultaneously receiving more exposure to the natural benefits of being outdoors. With all of these elements in mind, the question remains of how does interacting with a school garden-based curriculum promote more effective language development for ELL students?

Personal and Professional Significance

The topic of gardening, food, and sustainability in relation to education and language development is a topic which has been developing in my personal and professional life for many years now. It all began when I had the opportunity to live abroad in Antigua, Guatemala in 2009. I spent half a year immersed in the culture, teaching students whose first language was Spanish how to speak basic English. My

classes ranged in age from 5-15 with varying levels of school-engagement and limited and/or interrupted school attendance.

It was at this time that I was also exposed to the lifestyle that characterizes a third world country, which was a surprisingly refreshing point-of-view. The people were extremely connected to the land around them and knew more about gardening and food than many of the highly educated individuals I knew from the US. The food was fresh, local, and delicious – and not because it was trendy, but because they knew that it was best for them and it was their cultural tradition to shop locally. Upon leaving Guatemala, I pursued my desire to become a licensed English Language Learner teacher and started the Master of Arts in Teaching Initial Licensure program, but my reflections on the people and land of Guatemala stuck with me.

When I returned to the US, I started working at a federally-funded preschool program in the city. This was my first full-time, salaried job after college; I went in ready to learn and grow in my career. Working as a home visiting advocate, I had the chance to work one-on-one with preschoolers and their families in order for them to be ready for Kindergarten. The majority of students with whom I worked went on to later be classified as ELL students as they made their way to kindergartens in schools across the city. Their background as being multilingual and labeled as first, second, or third generation immigrant or refugee classified them at an early age as being a part of the community I would later dedicate my life to work with, and some of them even showed up in my classes at the elementary school years later. Working at the preschool was a fascinating experience and I learned a great deal about how the low-income, immigrant and refugee

population of my city faces a variety of societal barriers and obstacles when it comes to thriving in their own community.

One of those challenges which I witnessed on my home visits was the lack of access to healthy foods. The area of the city in which they lived was known as a *food desert*, which are defined by the USDA as “parts of the country void of fresh fruit, vegetables, and other healthful whole foods, usually found in impoverished areas. This is largely due to a lack of grocery stores, farmers’ markets, and healthy food providers” (Gallagher, 2011). Living in a food desert had real, lasting consequences for the students I worked with.

One moment that I distinctly remember, which shaped my views on food and justice issues for the rest of my life, was a particularly striking situation I encountered on a home visit when the student was eating Hot Cheetos and drinking a bright red sugary drink, similar to Kool-Aid. When she opened her mouth to smile at me as I came in through the door, I noticed she had mere stubs of teeth because of the lack of nutrition she was receiving and the lack of proper dental care she had access to. It occurred to me that this scenario took place not only in a first world country, but also that this five-year-old already had the teeth of an elderly woman. It was then that I realized I wanted to be part of the solution to this problem; to be a part of the movement helping similar communities move toward better access to healthy foods. The communities with which I worked at the time were being hurt by the limited access to fresh foods, and the sad reality was that the population which I worked with and continue to work with is largely impacted by this situation day in and day out, even now.

I continued my journey in education by completing my license in K-12 English as a Learning Language in 2014, and also quit my job for a year to spend some time traveling and volunteering internationally before I jumped into the teaching profession. Part of the year which I took off was spent as a farmhand in Italy where I worked on three different organic farms over the span of three months. This farming experience, combined with my previously formed conclusions about food education plus my newfound knowledge acquired through my teaching license in ELL, all gave me a new perspective and motivation to do something that could deeply affect the lives of students in the Midwest who were struggling to thrive.

It was then that I developed the belief that if a family knows how to make the smaller, healthier decisions regarding their daily food choices, they would have the fuel necessary to better engage in society and that this simple act of cooking could indeed change the entire trajectory of a life born into poverty. With that improved trajectory, a family could better achieve their goals and dreams, bringing them to break through societal barriers which may have previously held them back. It is a lofty vision, but one I still stand behind. Food is a basic element of life; it's part of *Maslow's Hierarchy of Needs*, and without it we can't survive (Burton, 2012). By merely upping the informed discernment on our food decisions, food can change an entire life.

Beginning in 2016, I became an elementary ELL teacher at an inner-city charter school and was also hired as a seasonal farm educator at a local farm for the summer months. I was experiencing the best of both worlds: teaching students how to use their hands and better understand the natural world through farm education, as well as working with English Language Learners throughout the school year and directly impacting the

academic growth happening in the classrooms of the Midwest. It was at this time that it occurred to me that these two worlds which are currently very separate could be combined to produce exponential results.

The students I get to work with during the school year need hands-on teaching that forces them to use language on more practical levels. Gardening work is an on-the-job type of training which forces the learner to engage on many levels in order to understand what's going on, and to make sense of the connections that food has to our everyday lives. In addition, it was found that gardens were a more accessible resource to people living in the city than farms, and accordingly this is what led me to the decision to explore how interacting with a school garden-based curriculum promotes more effective language development for ELL students.

The benefits of a project such as this are threefold: first of all, the students who benefit most from hands-on instruction are forced to use their language in order to perform basic functions and accomplish a task; secondly, the students are being educated about where their food comes from and benefit from the literal and hypothetical fruits of their own labor; and thirdly, the community is benefitting from these students learning about the environment they live in, how they impact it, and how to be better stewards of the place in which they live. Overall a garden education for innercity students produces globally engaged citizens of the world with a deeper empathy for all living things.

Summary

In this chapter I touched on the need for best practices in education for English Language Learners as they develop their language and the ways in which gardening and similar hands-on experiences can benefit this population. By reflecting on my own

professional and personal experiences that have been woven throughout my life to connect farming/gardening and the education of ELL students, I am amazed at the ways in which these two areas can build off of each other in a very meaningful interaction. Bringing the best of both worlds together, I hope to create a project with benefits all sides of this research question. In chapter 2, I will review the relevant research in regard to best practices for ELL education, the use of gardening in current educational systems, and how to incorporate the two together to create a garden-based hands-on curriculum that promotes more effective language development for ELL students.

CHAPTER TWO

LITERATURE REVIEW

Introduction

The intersection of garden-based curriculum and ELL language development is a topic which is not typically covered in current academia. By looking further into how interacting with a school garden-based curriculum promotes more effective language development for ELLs, there are sources which study the two elements of the question – the best practices for working with ELL populations, and general education (mostly directed at science) through the means of gardening. But the resources are few and far between regarding direct connections to the field of ELL research as connected to gardening education. Thus, it is essential to address the leading question in a couple of different components.

This chapter begins with the history of ELLs in the United States of America and how their numbers have grown in the K-12 setting, which leads to an explanation of the diversity existing within this umbrella definition which describes a highly homogeneous group of people. Following this, this paper will dive into the research surrounding specific work with ELLs, basing much of the framework around an all-encompassing

theory of Claude Goldenberg, a Stanford University professor and expert in the field of ELL research, who states that all students benefit from general classroom strategies, but ELL students in particular benefit from more substantial strategies in addition to the traditional methods.

From there the paper advances into a series of best practices to be used with ELL students and the ways in which each strategy can naturally be incorporated through work in a school-based garden. The practices include: additional instructional supports, combining strategies for maximum impact, embedding language instruction and creating more opportunities for language use through WIDA's four language domains, motivating students through valuing the home language and culture, using multiple modes of instruction, including multisensory and authentic experiences through the natural inquiry that happens in the garden, and finally incorporating project-based, service, and cooperative learning models.

Once the strategies and their potential with school-garden based curriculums have been established, the concept of gardening as an educational program in and of itself is discussed more in-depth. Following this is a discussion on the positive results from interactions with garden-based educational programs and the natural connection that science inquiry has with language development. All of this analysis leads to the conclusion that creating a school garden-based curriculum does in fact promote effective language development for English Language Learners, and this melding of models can be utilized very successfully, as will be illustrated in chapter 3.

History of English Language Learners in the United States

The term English Language Learner (ELL) is defined as: “students whose first language is not English and who are in the process of learning English” (Colorín Colorado, n.d.). While the terms have changed over the past 30 years since beginning to track and quantify this population, the fact that people have been immigrating to the United States for various reasons has remained true since the founding of this nation. According to the National Council of Teachers of English (2008), “[I]n the past 30 years, the foreign-born population of the U.S. has tripled, more than 14 million immigrants moved to the U.S. during the 1990s” (p. 1). It is important to note that ELLs by definition are not necessarily foreign-born; in fact, many of today’s current ELLs in primary and secondary schools are second or third generation immigrants whose linguistic heritage qualifies them to receive ELL services, but many students’ stories begin with a past that includes immigration into this country from a non-English speaking location. The K-12 ELL population has been on the rise for a long time, and the number is quickly nearing 5 million students (Claudio, 2017).

According to the National Center for Education Statistics (2017), ELLs made up 9.1% of the public-school population in 2004-2005 and 9.4% of that same population in 2014-2015 (4.5 million); this is a difference in number of about 300,000 students within a 10-year span. Looking back even further, the ELL population in 1999-2000 was at 3,042,000 which means there has been an increase in close to 2 million students within the past 17 years, and the numbers continue to rise (National Center for Education Statistics, 2017). According to the US Department of Education’s Office for Civil Rights (2013-2014), Minnesota, where this paper was submitted, was the 15th largest population of ELLs in the country during the 2013-2014 school year.

The evidence shows that there is a large and growing population of ELL students within the US. What makes this population unique is that ELL students come from all parts of the world and have various home languages (defined as languages they use at home and within their family group of origin). The most common languages represented are Spanish at 77%, followed by Arabic, Chinese, and Vietnamese (National Center for Education Statistics, 2017). It's important to note that even within the Spanish-speaking segment of the population there is much diversity as there are an estimated 400 million native Spanish speakers in the world coming from 20 distinctly different countries and cultures. This variance in country and culture creates a wide variety in understanding and shared language norms (British Council, 2014). In short, the Spanish speaking population is just as diverse within itself as the rest of the non-Spanish speaking students that make up the remainder of the ELL population in the US. This further emphasizes the need for differentiated instruction. Because ELL students are an extremely heterogeneous population that is projected to continue grow, something needs to be done now to address their learning needs. With a renewed emphasis on test scores and high achievement, now it is more important than ever to differentiate education to work with the unique skill sets these students bring to the academic table.

Research on Best Practices with ELLs. The research done on the topic of ELLs has been widespread, but some would say it has been unfocused. According to Claude Goldenberg (2013), the lack of common practices and recommendations after such a body of research is surprising, but he narrows it down to four general principles which he deems necessary in best practices for ELLs: "I. Generally effective practices are likely to be effective with ELs. II. ELs require additional instructional supports. III. The home

language can be used to promote academic development. There is also a fourth principle: ELs need early and ample opportunities to develop proficiency in English” (p. 5).

Using Goldenberg’s synthesis of the available research on ELLs, it’s important to note that general classroom strategies which are already in effect are indeed beneficial to ELL students. This paper’s emphasis, however, is to assume that the more traditional strategies are already in place, and hence shift the focus onto those which have had a more effective impact for the ELL population specifically. As Goldenberg (2013) emphasized, ELLs do require additional instructional supports; and to foster these more effective language learners, teachers must focus their instruction on best practices which have the maximum impact in order to push their students forward onto an exponential, rather than linear, path.

Many ELLs come to the US school system with a noticeable gap as many are not at the same grade levels linguistically as their native English-speaking peers and therefore teachers must put systems into place that advance these students’ educations exponentially. Consequently, using Goldenberg’s analysis as an overarching umbrella, the intent in this paper is to focus on the second, third, and fourth elements which he highlighted - additional instructional supports, home language support as a tool, and providing many opportunities for language practice, in order to use the research to our students’ best advantage through connecting them with a school garden-based curriculum.

Best Practices and Additional Instructional Supports for Working with ELLs

With such a large and varied population to serve, it is no wonder that many teachers are at a loss of how to best support this student population. This section covers

best practices and additional instructional supports that can be utilized when working with ELLs that will help guide this project of how interacting with a school garden-based curriculum promotes more effective language development for ELL students. According to WIDA, the company which regulates standards for ELLs in the majority of the country, their Essential Actions (2013) state that instructional supports are one element which must be supported in order to scaffold language learning for ELLs. Instructional supports come in many forms, but most importantly they adapt to the students' needs and support the language learning necessary at that time. By capitalizing on what the research says regarding working with ELLs, we can come up with a range of strategies which are most helpful for this population and incorporate them into a school garden-based curriculum which naturally supports many of these methods.

Combining Strategies for Maximum Impact and Embedding Language

Instruction. Choosing to create a curriculum which is garden-based and hands-on provides the opportunity to put multiple strategies into practice at once, starting from the very first day in the garden. In using research-based best practices with this population, the student achievement will be much more substantial. Research shows that combining language development skills with engaging content can significantly increase an ELL's academic performance. According to The Education-West (2017), the process of combining multiple strategies at once helps to increase an ELL's overall performance, thus reiterating the research-based finding that ELLs require additional instructional supports in order to grow academically. In this respect, embedding language development tasks into the content area can have monumental effects on a student's learning. According to Diaz-Rico (2008), the term "content literacy" applies to the combination of

ELD principles paired with content teaching, thus promoting the student's fluency in a certain discipline because the concepts have been taught and scaffolded for a student who is still learning English (p. 134).

One of the most important elements in creating a curriculum specifically directed at ELL is the element of language. Curriculum without language opportunities is the same as a classroom curriculum and while all material will benefit ELLs, it will not create the maximum impact this project hopes to generate. It is important to create more language opportunities so that ELL students are getting the language practice they need. The key elements of quality instruction in this model include the ability of language teachers and content teachers to work together to provide "comprehensible input to the learner, as well as design tasks that are both comprehensible and important" (Diaz-Rico, 2008, p. 134). Quinn & Lee (2011) state that the teaching of content alongside language requires that students are engaged in purposeful activities, have access to many types of language, and the multiple uses are specifically brought to their attention.

ELLs have four language domains that are the main focus through WIDA, the leading agency in the instruction of ELLs that consists of a consortium of states which develops standards and assessments to standardize the instruction of ELLs across the country. With WIDA being a main authority in the Midwest, this is the framework we will base our analysis around (WIDA, 2013). The four language domains of listening, speaking, reading, and writing can all be incorporated into the content area every day in order to support ELLs' language needs. The two receptive domains of listening and reading and the two productive domains of speaking and writing can all be incorporated into a school garden-based curriculum to help further an ELL's language development.

By providing opportunities for all domains every day through the best practices strategies discussed in this paper, the environment for maximum impact will be created.

While the language domains of listening and speaking are natural to incorporate into the learning happening in the garden, there is also a vital need to incorporate the final two domains of reading and writing for true academic success to happen for ELLs in the garden. Many educators have created intensive units surrounding activities and experiences in the garden to support the elements of reading and writing that can naturally flow from the student's work outdoors. Tying in the strategies of PBL and Service Learning (to be outlined later in this chapter), the prospects are endless ranging from science experiments, to informational posters, to cause and effect demonstrations. Some ideas for the actual projects used to reinforce the methods taught in the garden can be further explored in Appendix B (Habib, & Doherty, 2007, Blair, 2009).

While the ending projects and formative assessments might be easier for the traditional teacher to imagine, the actual scaffolding and ongoing daily supports in reading and writing are the elements which might be harder for the non-ELL licensed teacher to imagine. Williams, Anderson, & Park-Robbins (2015) chose to incorporate smaller projects throughout the learning in the garden in order to provide tangible ways to increase language learning throughout. By taking the traditional aspects of the mainstream classroom and using them outdoors in the garden, a multidisciplinary approach can enhance the ELL's education, creating a more rounded student overall. As Habib & Doherty (2007) state, "School gardens enable fertile ground for reinforcing science concepts and also provide an opportunity for curriculum integration, enabling teachers to involve a variety of subjects within a garden lesson" (p. 10).

Motivation and Valuing of Individual Student and Home Language and Culture. Another element which is crucial to a ELL student's learning is their level of engagement and motivation. One study suggested that motivation for ELL students has little to do with grades and academics and much more to do with content that is applicable to life outside of school such as creating a collaborative community, touching and feeling the learning, and creating a safe space where a student can freely express him or herself (Williams, Anderson, & Park-Robbins, 2015). Indeed, the element of feeling safe to practice language is vital to the world of many ELL students. According to Habib & Doherty (2007), the students in their study reported overwhelmingly that "the school-garden is a place where they feel safe, in their words, happy, relaxed, calm, and safe" (p. 5). Coming into a new country with many different experiences, new students can get ignored in the rush, and thus a student can easily feel devalued by the US education system and could cause a student to become "tongue-tied" in the American classroom (Williams, Anderson, & Park-Robbins, 2015).

In their study, Williams, Anderson, & Park-Robbins (2015) found that, "Allowing students' cultural, emotional, and social expressions helped them feel valued and included" (p. 33). In *Strategies for Teaching English Learners*, one of the mega strategies highlighted is to "Teach the whole person – beliefs, body, brain, emotions, and culture – within a positive social context" (Diaz-Rico, 2008, p. xxv). Cutter-Mackenzie (2009), states that programs such as these can give a "sense of belonging for students newly arrived to the country" (p. 129). When a student feels valued for who they already are, they will be much more likely to open up to the world outside of themselves. Students who come into the country as immigrants immediately experience a shift in all they hold

to be true as their encompassing culture disappears in the length of a plane or car ride, and they are left with the pieces of having to define their new normal.

According to Diaz-Rico (2008), students who are faced with new experiences will practice a certain level of inhibition. When these same students are provided a safe space in which they can freely make mistakes without constantly being corrected they will grow in their ability to communicate freely as a result (Diaz-Rico, 2008). The anxiety that students experience as a result of Second Language Acquisition can be extreme as “[u]sing a foreign language can threaten a person’s sense of self because speakers know they cannot represent themselves fully in a new language or understand others readily” (Diaz-Rico, 2008, p. 54). Teachers who work on creating that community where every member is valued regardless of their language level is vital in helping an ELL enter into that space where they can practice using their English language skills with more frequency and fluidity.

In addition, non-native English speakers who are learning English will always interpret the world and their new language through their native language rules and it is important to incorporate the student’s native language as much as possible to promote engagement and value in what is being taught (Tarone & Swierzbin, 2013). Lee et al. (2016) created an environment in which English was being taught and valued, but where the students’ native languages were also being displayed as a method for increasing access to the content. Home language use was one of four instructional practices highlighted as being a strategy that a truly effective teacher utilizes, and it is easy to see why, as research backs up this need to value the student’s home culture and language for identity development in their new culture (Lee et al., 2016). Additionally, Quinn, Lee, &

Valdes (2011) are quick to point out that the teacher need not speak or understand the home language in order to use it as a valuable support for their ELL students' learning.

As long as there is an empathetic understanding of the experiences the student is going through when adjusting to a new language, and a safe space is created where the whole student is welcomed, then the student will be able to excel much more rapidly (Quinn, Lee, & Valdes, 2011). In teaching ELLs, there is a point at which the student can lose connection with education, but this is much less likely to happen if the groundwork has been laid to value every student and their culture, no matter where they come from or how they got there.

Multiple Modes of Instruction. Additional strategies which have been found to be beneficial with ELL students include the use of multiple modes of instruction. According to Williams, Anderson, & Park-Robbins (2015), presenting students with visual access to the content allows for interaction with the materials not typically addressed with traditional language-based procedures. While Lee et al. (2016) suggests that presenting learning through these multiple modes such as “gestural, oral, pictorial, graphic, and textual” is a strategy that effective teachers use in their classrooms, and this method highly supports the instructional needs of ELLs (p. 581). Indeed, multiple modes of instruction could also be classified as employing a wide variety of instructional supports that integrate all four of the language domains which, according to WIDA's Essential Actions (2013), provides “rich, authentic instruction” that is necessary for an ELL's ability to succeed academically (p. 11). Reed & Railsback (2003) stated:

Teachers can make content more understandable to their students by providing nonverbal cues such as pictures, objects, demonstrations, gestures, and intonation

cues. Other strategies include building from language that is already understood, using graphic organizers, hands-on learning opportunities, and cooperative tutoring techniques. (p. 10)

The focus here is on multiple modes of instruction and using more than one method to communicate a concept. The benefit of working in farming and gardening is that most often the visual or hands-on elements is already fulfilled, and careful planning ensures that at least one more mode is being employed simultaneously to maximize the learning. By reaching out to a learner through at least one method that is easily understood by that learner and then by building upon it through a variety of additional methods, the learner will be able to interpret the information more easily because they have had multiple exposures to the information presented. Gardening by its very nature incorporates all the senses; by teaching language elements in addition to the tasks required of such an education, the student is able to connect on a deeper level.

Multisensory and Authentic Experiences. Another method which has been found to be especially helpful for working with ELL students is the impact of multisensory experiences on language-learning students (Williams, Anderson, & Park-Robbins, 2015). The students interviewed in the Williams, Anderson, & Park-Robbins (2015) study, which worked with a select group of teenagers in a school-garden, stated that they found much enjoyment in working in the outdoors and this increased their connection to the garden they worked in, giving them a certain ownership of their learning that they did not possess in the classroom. As one student stated, “You feel it, you touch it. Instead of looking at a book, you actually work and try to plant a plant” (Williams, Anderson, & Park-Robbins, p. 33).

Engaging all the senses can have lasting effects on a student's education as Orr (2005) explained, "in the reciprocity between thinking and doing, knowledge loses much of its abstractness, becoming in the application to specific places and problems, tangible and direct" (p. 129). For many adult learners their most memorable learning moments were in some way tied to their senses and the effect that learning by doing can have on the brain. By creating concrete experiences that engage all five senses, the multiple modes of learning can also be involved which will in turn support the previous strategy of presenting information through multiple modes. All of these strategies can build upon each other to provide maximum effects for students learning English.

Natural Inquiry in the Garden. Working in the garden leads to natural questioning, a trait which is helpful for ELLs who often struggle with discourse in their non-native language. By encouraging students to formulate questions and find a variety of answers in the garden, they are self-directed in their learning and will push to use the language they need to get the information they need (Habib & Doherty, 2007). By creating an emphasis on learning processes rather than the outcome, the students are better able to create the understanding they need to learn across multiple disciplines (Duncan, et al., 2016). When the inquiry in the garden is scaffolded for ELLs, they are able to make the connections and thus develop into independent learners, much like their native English-speaking peers.

With each activity of the garden, there are countless opportunities to embed language. For Westervelt's analysis (2015), the educator chose between three different forms of inquiry: directed, guided, or full. With this, Westervelt (2015) created a matrix to correspond with different levels of questioning, science skills, and language skills (see

Appendix A). In creating a web of interconnected concepts that build and support each other, ELLs are able to reap the full benefits of a language-focused science curriculum. This ability of the students to make sense through discourse, or the language domains of speaking and listening, provided a chance for them to be creators of their own education and so their motivation and engagement allowed for them to connect to the lessons learned on a much deeper level (Rahm, 2002).

Project-Based, Service, and Cooperative Learning. Another strategy that is beneficial to ELLs is Project-Based Learning (PBL) which is centered around group collaboration and providing many opportunities for peer talk (Diaz-Rico, 2008; Williams, Anderson, & Park-Robbins, 2015). Two beneficial elements to PBL are that they are contextualized and appropriately challenging (Diaz-Rico, 2008). In order for ELLs to truly develop language, they need to be given authentic opportunities to test it out in the real world. In the words of Diaz-Rico (2008), “the real world is relatively complex and unstructured, and the stakes are enormous. The efforts of individuals and groups make a difference. Project-based learning (PBL) is an opportunity for students to take on tasks that are consequential” (p. 386).

Students who are learning language need to see that what they are learning matters and has a lasting impact on the world around them. PBL is also a great way to build ties between schools and the greater community by giving them an opportunity to invest in the physical space around them, such as through a school-garden (Reeves, Emagwali, & Feille, 2010). As Ableman (2005) stated: “The process of growing food is settling. It provides clear and immediate sense of how one’s actions affect the world” (p. 181). Sobel (2004) agrees by stating that place-based education such as gardening helps

build these students who are focused on service learning and helping the local community because it “creates a heightened commitment to serving as active, contributing citizens” (p. 7).

According to Williams, Anderson, & Park-Robbins (2015), PBL with the added element of cooperative learning is proven to be a successful model as students create deep bonds with one another across cultural barriers and recall their experiences in working in the collaborative atmosphere of the garden with much nostalgia connected to the experience even after the project completes. One student stated, “What I feel about the Learning Gardens is that I’m taking care of something with everyone else. You learn to work together. It is a time to bond with friends” (Williams, Anderson, & Park-Robbins, 2015, p. 31). In another study, it was found that “peer-to-peer comfort levels improved dramatically” just by working together on a common project of being in the garden (Reeves, Emeagwali, & Feille, 2010, p. 35).

For science teachers who employ similar strategies to PBL in the form of science inquiry, one of the most effective methods they can use is creating space for students to make sense out of the science in front of them through group collaboration that requires the use of speaking to communicate their thoughts and opinions (Quinn, Lee, & Valdes, 2011). Often the best science projects follow the PBL model in structure because there are certain scientific concepts to prove that must be tested out through experiments, thus reiterating that this strategy is good for everyone and thus it is a good strategy for ELLs as well.

Gardening as an Educational Program

The final section of chapter 2 highlighted the research surrounding curriculums that use farming and gardening as an educational technique. Farming and gardening, specifically focused on educational farms and school-gardens programs, have a lot of research that is more often linked to science education than ELL and language learning. By promoting a curriculum which has multidisciplinary benefits through science as well as the subtler benefits of physical education, art, math, and more, the students will profit from a more rounded education overall.

Science education has always been a content area closely connected to many of the above-mentioned educational strategies because it has to do with the elements of nature that we come in contact with on a day-to-day basis. It would be difficult to learn many science concepts without incorporating the hands-on elements of touching and feeling a science experiment. As Westervelt (2015) states, “inquiry-based science employs many tried-and-true ELL instructional strategies” (p. 1). Indeed, the opportunities for academic growth with ELLs are boundless when it comes to science, but the language elements need to be intentionally embedded and connected to content in order to truly help ELLs gain the maximum benefit.

Benefits of having a garden-based educational program include that the students get the opportunity to interact with the outdoors on a level they normally would not experience in the classroom. These programs can range from a farm visit once a year to a daily interaction in an on-campus school-garden during the growing season. The practicalities and considerations that need to be considered for this type of curriculum can help answer the question: what benefits do farm and garden-based education programs have for regular students within the United States? It will also attempt to answer the

question of: is it worth the time and effort to create a program such as this, or do the benefits of regular teaching within the classroom have the same results? In other words, what makes farm and garden-based education *unique*?

In an NPR article exploring the connections between the healthy minds and bodies of students, Pflieger (2015) states that one nationwide program that has focused on getting students out into community gardens during their summers off has seen a 12 to 15 percent increase in students passing their standardized tests, and attributes a large portion of this improvement to their work outdoors and the personal connections they are making in the gardens. These same gardens have been proven to help troubled students deal with problems they bring to school and prevent other risky behaviors that they may normally pursue, but because of the intervention of the gardens they are able to make healthier decisions and move forward instead of backwards (Reeves, Emagwali, & Feille, 2010). Additionally, students who work in gardens develop a sense of place and feel connected to the projects and experiences they encounter as they discover new talents and passions (Williams, Anderson, & Park-Robbins, 2015; Reeves, Emagwali, & Feille, 2010).

Students are negatively impacted by a lack of access to the outdoors and research shows it is getting more harmful for younger generations as the years go on (Louv, 2008). According to Hooker (2016), students who are in Generation Y (students aged 10 or older in 2017) "...often fear intimacy and awkwardness because they lack interpersonal communication skills, choosing to hide behind digital technology instead of engaging in interpersonal communication" (p. 2). One author, Richard Louv (2008), has labeled this disconnection with the outdoors and tangible experiences as the "Nature-Deficit Disorder" and he goes on to explain that this disorder has direct connections to a child's

physical and emotional wellbeing (p. 10). If we continue in the pattern we have begun, the following generations after Generation Y (aged 16-36 in 2017) will be even more harshly impacted by this disconnection with the outdoor surroundings we live in (Hooker, 2016).

Based on the research surrounding students who have had educational experiences on farms and through school-gardens, the results are overwhelmingly positive being more of a benefit than a drawback. Even the teachers surveyed who were required to implement more outdoor environmental education in science agreed that when garden-based education is enacted, it ends up being more enjoyable and informative than time-consuming, which is a typical concern that teachers have when faced with implementing new curriculum (Ferreira, Grueber, & Yarema, 2012). There are positive results for the teachers as well as their growth of science knowledge increases, even for those without science training (Lee, et al., 2016). It is worth noting, however, that many of the studies are on a small scale and location-specific, while one study did not note any significant differences between the control and the experimental group, more research would have to be done to create consistency in the research (Waliczek, Bradley, & Zajicek, 2001).

Positive Results for Interaction with Garden-Based Educational Programs.

For students who have the opportunity to engage with a school-garden curriculum the results are endless on the positive effects they experience, even years after their experiences, as students tend to look back on their time with fondness (Williams, Anderson, & Park-Robbins, 2015). According to Ratcliffe, Merrigan, Rogers, & Goldberg (2009), gardens have the potential to enhance curriculum, physical fitness, and social learning in schools where they are enacted, which also results in students who are

healthier eaters because of their deepened understanding of the food cycle and its many connections to our lives. When students are able to taste and touch the food they come in contact with in a garden, the connections are much deeper, and they are able to internally make better decisions when it comes to food choices and consumption (Ratcliffe, Merrigan, Rogers, & Goldberg, 2009). According to Denver Urban Gardens (2012), the benefits to students range from academic achievement to physical health, and from social and emotional health to school and community benefits.

Based on research by Habib & Doherty (2007), “The school-garden supports student inquiry, connection to the natural world, and engages students in the process of formulating meaningful questions” (p. 10). While more research is needed, the overall consensus is that getting students outdoors to experience a garden is always a better option than keeping them indoors. Students are better connected to the world around them, more emotionally secure, and well-rounded. For students who are immigrants and refugees, the benefits are even more pronounced as they are searching for those very elements to ground them in their new country and culture.

Merging Science Inquiry with Language Development. In the past, it was thought that a student must become fully proficient in English before being able to engage in the science content presented at grade level. The reality, according to Westervelt (2015), is that the two knowledges are able to develop simultaneously, and the two areas actually enhance each other to grow in a synergistic type of relationship. Science, and the hands-on inquiry it provides, can be a meaningful conduit of language for students who are still learning the language. In another study, it was found that the science-based inquiry that naturally happened in the garden helped students to lead the

discussion and organically develop deeper levels of meaning and language, leading to higher order questions and cognition in the brain (Blair, 2009).

According to Blair (2009), “the multitude of unstructured learning opportunities that are not in the lesson plan, happen spontaneously and nonhierarchically, and involve students and their adult mentors in multidirectional learning” (p. 20). With the limitless opportunities to explore and question, a student’s brain is better able to retain information and ideas, which is essential in the first steps of cognition (Blair, 2009). Students engage deeply with materials that are beyond the concrete examples in front of them as well as learn to ask the deeper questions which lead to solidifying the knowledge they have gained from the gardens in their own words and understandings (Habib & Doherty, 2007).

Conclusion

In conclusion, the findings are quite clear in the benefits of having ELL students engage in garden-based education programs. While more research could be done, the current available research shows that student academics improve as a result of interaction with an ongoing garden experience, and ELLs can reap the benefits exponentially when all four of the language domains are incorporated. The maximum benefit can be found for these learners who need exponential growth in their language abilities by initiating the range of strategies found to be best practices with this population: additional instructional supports, combining strategies for maximum impact, embedding language instruction and creating more opportunities for language use through WIDA’s four language domains, motivating students through valuing the home language and culture, using multiple modes of instruction, including multisensory and authentic experiences through the

natural inquiry that happens in the garden, and finally incorporating project-based, service, and cooperative learning models.

These findings show that through using best practices for ELLs, a garden-based education can indeed accomplish the effective language development desired. The breadth of positive results for garden-based learning points to this being a great method for teaching ELL students that can provide the leg up they need to truly thrive in a new environment, surrounded by a new language. This research will go into practice with chapter 3 which will delve deeper into the project surrounding the question: how does interacting with a school garden-based curriculum promote more effective language development for ELL students?

CHAPTER THREE

PROJECT DESCRIPTION

Introduction

The goal of this project was to design a curriculum for ELL students that focused on working them with their hands in a school-garden, in order to reaffirm the research question of how interacting with a school garden-based curriculum promotes more effective language development for ELL students. This chapter describes the project in its entirety, starting with the curriculum overview which explains how the curriculum is laid out logistically to help the reader gain a basic understanding of what it will look like. The chapter continues with the description of the curricular framework that describes the methods and models that the project is based upon to help connect the project to a research-based educational method and provide additional validity beyond the research provided in chapter two. Following that, the audience and setting are addressed, while describing specifics of who will benefit most from this curriculum; this provides the context for the project with a deeper understanding to help the reader visualize who is on the receiving end. The final parts of the paper address the timeline for completing the curriculum throughout the school year as well as the professional presentation attached to

this project to explain the length of time expected to complete a project such as this, and also to describe the impact this work will have on the wider educational world.

Curriculum Overview

The curriculum consists of a series of seven units to be disseminated in one or two-hour-sessions once a week throughout the school year. Each session is adaptable for a specific grade level, ranging in grades from 3rd to 5th. Each grade level ELL class receives a one-hour to two-hour session depending on time restrictions and provides instruction in small groups ranging from 4-10. The ideal day of the week to conduct this class would be Fridays, as it is an opportunity for students to get out of the traditional classroom and provides a reward for students to look forward to throughout the week. In situations where the Friday has been cut out of the regular week, teachers would have the option to rearrange class to conduct the session on the final day of the week, or shorten the schedule all together, hence cutting out various weeks of instruction.

Based on the typical school calendar, there are approximately 28 weeks of instruction, excluding weeks when there is time off because of holidays. If a teacher needs a shortened schedule, teachers have the freedom to work flexibly in the curriculum. Lessons are built in a sequential manner that builds the knowledge throughout the year, and lessons will need to be taught in order for students to get the foundational concepts that are woven throughout the curriculum.

Each lesson engages all four language domains: listening, speaking, reading, and writing, and is delivered through the various strategies previously outlined in chapter two. Lessons are delivered via small group instruction, with differentiation happening based

on the language needs of that specific group. The curriculum is relatively flexible as much of ELL instruction changes based on the learners.

The units are each focused on various WIDA (2012) English Language Development Standards, which are highlighted in each lesson: 1) social and instructional language 2) the language of language arts, 3) the language of mathematics, 4) the language of science, and 5) the language of social studies and are embedded throughout each lesson (p. 4).

The practices that are utilized in this curriculum are taken from the research completed in chapter two, which includes the following strategies 1) additional instructional supports, 2) combining strategies for maximum impact, 3) embedding language instruction, 4) creating more opportunities for language use through WIDA's four language domains, 5) motivating students through valuing the home language and culture, 6) using multiple modes of instruction, 7) including multisensory and authentic experiences through the natural inquiry that happens in the garden, and finally 8) incorporating project-based, service, and cooperative learning models.

In summary, the question of how does interacting with a school garden-based curriculum promote more effective language development for ELL students is answered through this curriculum which is delivered in seven units spread throughout the majority of the school year (November-June). The lessons focus on developing the students' capabilities in the four language domains through the strategies described earlier in this paper.

Curriculum Framework

The curricular framework that this project is based upon is *Understanding by Design (UbD)* (1998), which utilizes the method of backward design, described as “...[o]ne starts with the end—the desired results (goals or standards)—and then derives the curriculum from the evidence of learning (performances) called for by the standard and the teaching needed to equip students to perform” (p. 8). With the planning emphasis on what the students need to learn by the end of the lesson, the design of the activities and teaching beforehand is much more focused and intentional. Additionally, this curriculum can easily be used and adapted in many school settings since the method is well-known throughout the education field. *UbD* is a well-thought-out method which emphasizes the learning essential to the students. By focusing on language development as a major part of the assessment, the school garden-based element will serve as the means to deliver the language, and the assessment can be conducted in multiple methods, all based on the best strategies outlined in chapter two. In *UbD* (1998), “backward design calls for us to operationalize our goals or standards in terms of assessment evidence as we *begin* to plan a unit or course” (p. 8). This design puts our assessment as the goal, rather than an afterthought.

Additionally, many planning elements for this project are adapted from the agricultural curriculum resource *Project Food, Land, and People (FLP)*, edited by R.H. Wenzel (2003), which is a project-based curriculum. According to the research, project-based learning is a major method for conducting science experiments within the classroom, hence the use of this method when referring to school garden-based learning is similar and adaptable. Combining original content with FLP and UbD creates an

overall hybrid design that is specially adapted for academics with gardening projects as the basis for learning, allowing for a seamless instruction throughout.

In summary, the two curriculum models that will be used to design and create this project, which answers the question of how interacting with a school garden-based curriculum promotes more effective language development for ELL students, will be *Understanding by Design* (1998) and *Project Land, Food, and People* (2003). The two models will work in tandem to create assessments and activities which lead ELLs into deeper language understanding through interaction with a variety of concepts as connected to the school-garden.

Audience and Setting

This project is meant to be utilized in an elementary setting and exclusively with English Language Learners from all grades in WIDA levels 1-4, including new-to-the-country students and more advanced learners as the interactive emphasis is a good model for all students, especially those with low language levels. The focus of learning is for grades 3-5 with encouragement for growth and differentiation to additional grades as needed and able. Students in grades 3-5 are the focus because of their developmental level which allows for adequate interaction with the garden and chances for deeper questioning that can help prepare these students for the fifth-grade standardized science test. By limiting the grades represented, the materials and content is more focused on the skills and abilities that are age-appropriate, and additionally gives students in the younger grades the excitement to look forward to interacting with the garden once they are older. The project was created for a smaller school setting (approximately 300 students total,

30% being ELL students), and so the intention is that students get more 1x1 interaction with the garden and curriculum.

Additionally, the chosen audience comes from a low-income background, with many students coming from refugee or immigrant families. The curriculum is designed to introduce students to the world of agriculture who have little to no experience with the subject and starts from the ground up when approaching the information in order to provide a basic understanding which can be easily built up. While the content being taught is gardening, how to garden, taking care of the earth, sustainability, and other similar topics, the means by which the information is portrayed is very much language-based with the intent to increase the amount that students are listening, speaking, reading, and writing.

With the intent to secure grants from various local and national gardening and health-conscious organizations, the gardening can take place in raised bed boxes in the back lot of a public school in the Midwest. The gardening curriculum is constrained to the school year, September through June, but provides additional opportunities for extracurricular engagement throughout the summer as the lead teacher is able to facilitate. This curriculum has the benefit of being able to be reused yearly, as the growing season always presents new changes and challenges.

Pending logistics and availability, students also get the opportunity to have more unstructured time in the garden after school on various days throughout the fall and spring. This time is intended to be led by the lead teacher who will conduct a Gardening Club that engages the same students outside of school in a more experiential, student-led gardening time.

In summary, this project is intended to be delivered to elementary students in grades 3-5 in an urban setting located in the Midwest. Funding will be secured through various grants and there will also be the additional opportunity to have the Gardening Club exist outside of regular school hours.

Timeline

As described above, the project is to be completed over a series of months – throughout the regular school year – from November to June, with opportunities for extension throughout the summer. The curriculum is delivered in sets of one-hour to two-hour lessons taking place once a week, preferably on the final day of each week, with the opportunity to expand to more classes if desired. Classes are conducted out of doors as often as possible, with the understanding that winter classes in the Midwest often have to be conducted indoors based on temperatures.

Lessons during the winter months are mainly taught indoors, with the possibility of some outdoor lessons, weather permitting. For the purpose of this project, fall is defined as September-November, winter is defined as December-March, spring is defined as April-May, and summer begins in June (see appendices for complete calendar matching the curriculum to the gardening seasons). Because the growing schedule varies each year based on weather, there is room in the curriculum for flexibility in regard to outdoor and indoor schedules. The curriculum is on a one-year rotation with the same curriculum being repeated every year. Variety in the curriculum depends on the lead teacher and other variants in the manner of students, grade levels, available supplies, changes in the outdoor space, etc., but the core curriculum does not change.

Presentation of the Project

The project will be presented in the professional context of the annual ELL conference through a PowerPoint presentation in a seminar setting. This presentation will contain pictures to demonstrate the ways in which the curriculum will be performed, and also a detailed review of the best practices strategies as highlighted in chapter two. The curriculum itself is available in a typical book fashion for anyone who wants to enact a school garden-based curriculum in their own setting as a ready-made set of lesson plans. The project follows a regular format which most teachers are familiar with, see Appendix C for a general lesson plan template that could be adapted from each unit.

Summary

In conclusion, the main emphases covered in this chapter include the overview, framework, audience and setting, presentation of the project and the timeline for completion. The curriculum has all the aspects of the best practices as described in chapter two, with the added benefit of being intended solely for ELL students. This project answers the question of how to promote effective language development for ELLs through a school garden-based curriculum by using the best practices that have been outlined in the research. Not only is this project an opportunity to expose kids to more education in the great outdoors, but it is a chance to bring valuable engagement back to the language classroom. By giving students a sense of place and incorporating them into the learning that happens in a school garden, their ability to grow as learners will change exponentially. This curriculum is one step in the direction of promoting a more equitable education for this set of very special learners.

CHAPTER FOUR

CONCLUSIONS

Introduction

This project has been exploring the question of: how does interacting with a school garden-based curriculum promote more effective language development for ELL students? The process of completing this capstone has been long and arduous, but also incredibly insightful. The different roles I have had include researcher, writer, and learner, and each has been important in the development of the end product.

The following chapter is the conclusion to this journey. It recaps the capstone process and the roles I have played and revisits the literature review and the resources which have been the most helpful. This chapter also touches on implications and limitations that implementing the curriculum might have for a real-life classroom and ways in which I am planning to share and distribute the curriculum in the future. In the discussion of this process and its results, the school garden-based curriculum for ELLs is still a concept which can have far reaching benefits, but it is also important to assess the feasibility of conducting such a project and consider the barriers that might prevent a successful implementation. The overall impact of a project such as this far outweighs the difficulties, and I hope that the educational community may widely use this curriculum.

Different Roles of the Capstone Process

I am a lifelong learner, but the capstone project and paper put my role as learner into a whole different perspective. It was a good reminder that we are never done learning, and it is a process which has many stages and requires much revisiting and revising to come at a final solution. Even after a final solution has been found, it can continue to change; as a learner, this flexibility is an essential ability. I came back to this process as a learner many times, first in the exploration of my topic, next in the research element of chapter two, and then again in actually creating a curriculum which was able to encapsulate all the things that had been previously explained. Learning causes us to move forward from problems and barriers to solutions and explanations.

In becoming a researcher for chapter two, I learned that there was much more to this project than I had initially planned for. The research was endless. Although not all the research was focused on the specific topic of gardening for ELLs, it was relevant enough to have great weight when it was tied in with my topic. Pulling together the two worlds of science/outdoor education and ELL instruction in order to birth a third area of emphasis in school garden-based curriculum for ELL students was a feat which took all of my researching power. The end result of merging the topics together was unexpectedly easier than initially assumed and the connections began to mount as soon as the research was opened. School garden-based education is just good education for all kids and putting an at-risk population such as ELL into the realm of this special type of education was a somewhat new idea that had exponential impact. This is what the research findings taught me in the process of discovering them.

The third role of writer was a role which ebbed and flowed as the paper began with a small idea of possibility and morphed into a gargantuan project with over 30 resources referenced. Writing was a process which was clarifying and also directing, in that it helped me gain insight into what the project was really about, and how I needed to focus in to help readers and users of this curriculum understand the most basic principles to the successful implementation of this resource. Writing was also the role which connected me to others the most. In writing, I was able to connect with other classmates in the formation of the project and give feedback as I gave feedback. I was also able to share my work with others outside of my classroom experience, such as my content expert and friends who were able to edit and refine my ideas as I went.

Revisiting the Literature Review

In revisiting the literature review from chapter two, the vast research undertaken proved to be beneficial in forming the final project. It was not only helpful to take a deeper look into the history and background of ELLs in the U.S. to give a better basis of this population beyond the scenario in which I currently am situated, but it was helpful to hear the voices of academia within the ELL community. One of the resources which was most impactful was the research that came from the Learning Gardens in Portland, Oregon. In research compiled by Williams, D. & Anderson, J. (2015) called *Tongue-Tied No More*, the educators were able to analyze a school garden-based program with their ELL students. This is the program which most closely resembled the project which I am working to accomplish. It was great to gain the perspective of actual ELL students who interacted with the school gardens as their classroom and see the benefits which had only been hypothesized about in all the other texts. There was much research on the benefits of

school gardens, but to have the learnings specifically applied to ELL students and their language learning was a meaningful way to put the theory into action.

Looking further into the literature review of chapter two, some connections that I was able to make include the agreement with what Claude Goldenberg (2014) states in his article *Unlocking the Research on English Learners* that there is “surprisingly little research on common practices or recommendations for practice with the more than 5 million ELs in our nation’s schools” (p. 4). It is true that a variety of research can be found, but it is missing research which clearly guides and directs best practices and narrows strategies down to focus on a few exponential practices in a consistent, replicable manner. As a professional in the field of ELL, I now understand how important it is to continue to have educators researching the benefits and downfalls of the strategies we use with the ELL population. We need to be able to provide consistency and stability for this typically mobile population so that they can actually see the growth that they are capable of, instead of trying a new technique every year just to have it fail again. Education tends to be a field of “pilot programs.” Every year, there is a new pilot program happening that is often pitched as the answer to all of education’s toughest problems. The reality is that students change with time, and therefore so must the educational approach. By keeping our research focused on what matters most and giving each strategy the time to prove itself by being tested out on students over time and then adjusting or changing as needed *after* we see the results, we will be much more successful in educating our ELL students and narrowing the achievement gap which exists in many parts of the nation.

Implications

There are many implications in a project such as this. Availability of resources is a primary concern, especially for an innercity school such as the one that was used in the development of this project. Resources are hard enough to come by for many schools, so the idea of creating a school garden on top of an already restricted budget may seem impossible. Thankfully, there are many grants and opportunities available for those willing to pursue them. The teacher wanting to create a school garden at their own site could consider a more general grant such as the one offered through The McCarthy Dressman Education Foundation (find out more at mccartheydressman.org/academic-enrichment-grants), which is available for anything related to academic enrichment. Or a teacher could look for a grant with a specific gardening and outdoors education focus such as the Whole Kids Foundation Garden Grants (find out more at wholekidsfoundation.org/schools/programs/school-garden-grant-program), which is available for creating new or sustaining existing school garden programs. With the move for better access to healthier foods which has been sweeping the country over the past few years, opportunities for school garden grants are more readily available than they have been in the past for those willing to look.

Additional implications that arise as a result of this project are that there are few (if any) policies surrounding school gardens that would result in the adequate staffing and time dedicated to this type of program. Combining ELL and outdoor education and/or science, math, and social studies concepts could be considered an additional luxury many schools do not have the time or staffing to complete. Would this be an additional program? Would this be incorporated into the existing ELL program? Does the ELL teacher have enough training to teach science, math, and social studies concepts? And

vice versa, does the classroom teacher have enough training to teach the language concepts focused on in this curriculum? There are no openings in the traditional school setting for a “Garden Instructor” nor would such an instructor be expected to be well trained in language teaching and use. Implementing this project at any typical school would require extra effort and intentionality on behalf of the administration and a core group of dedicated teachers. There remain many implications on how to make this program successful instead of it being an additional obligation.

Limitations

In addition to the funding and staffing implications for a project such as this, discussed in the section above, the biggest limitation is that any weather-based curriculum must remain flexible and could experience major scheduling issues as a result of how Mother Nature decides to perform in any given year. Coming from a school located in the Midwest where the weather can be unpredictable and extremely cold, there is a limited number of school days students could be outside in the garden, and without the hands-on gardening element, there is little purpose in this curriculum. While the curriculum has been designed with the never-ending winter in mind, there is no guarantee that the planned materials and lessons will line up exactly with the desired outcomes of the project. Implementing this curriculum will require a teacher and/or team that are able to think on their toes and improvise as needed in order to accomplish all that is required in cooperation with the changing weather and seasons.

Planning for the Future

Moving forward, this project will be used in the setting which is described in chapter three. My main hope is that the curriculum can be utilized in a loose form the first

year to allow for a gradual ramp-up to establish the program without overwhelming the initiating teacher and/or team. In year two and beyond, there can be more adherence to the curriculum. Once the setting is in place and the resources are set aside to make this school garden-based curriculum happen, it will be much easier to use on an ongoing basis. In using the curriculum, it would be wise to note the areas which go well and the areas which seem difficult to communicate for a teacher's particular population of students. There are multiple modes used throughout the curriculum in order to reinforce the teaching which best suits ELL students as shown in the research; however, when flexibility is needed these multiple modalities are a place that can be pared down while remaining beneficial.

To use this curriculum well, it would have to be supported by friendly faces of the community – first at the school, and then in the wider neighborhood. It would be ideal to find a community sponsor who could visit on a regular basis, and help students build language confidence with audiences outside of their classmates.

Down the road, a hope for this curriculum would be to market it to local school and eventually the wider school community as a free or low-cost resource for school hoping to start their own school gardens. In an effort to promote healthier schools who want to see their ELLs grow, trainings could be held at annual conferences such as the MinneTESOL (Minnesota Teaching English to Speakers of Other Languages) yearly conference, and other related conferences where idea-sharing is encouraged in order to improve the learning of students in the most creative and beneficial ways possible.

This project will benefit the profession of the teaching of ELLs by encouraging educators to move outside the traditional classroom to provoke us to consider another

way. Another way to teach these nontraditional students who come from extremely diverse backgrounds and need educators to think creatively about how they best learn. The traditional classroom is not the best solution for a majority of our students; we need to think creatively about how we can meet them where they are so that they can be successful in the ever-changing global society in which we live. Pushing educators to think outside of the box – literally – will help those in the profession of ELL see that it is okay to adapt and grow our teaching simultaneously with our students. It is my hope that those who come in contact with this school garden-based curriculum will see that it does indeed promote more effective language development for ELL students.

Conclusion

In conclusion, exploring the topic of how interacting with a school garden-based curriculum promotes more effective language development for ELL students is an endeavor that will take time, money, and adaptation. In developing this curriculum, the essential resources directly connecting ELL students with work in a school garden were most utilized because they were concrete and actionable. There is a need for more consistency in ELL in general, and this was reflected in the analysis of revisiting the literature review which stated that there is a wide breadth of research without direct and specific strategies. The implications and limitations were acknowledged as we addressed the issues of resources, policies, and weather restrictions, which will need to be considered in implementing this school garden-based curriculum for ELL students. In planning for the future, adaptability, flexibility, and improvisation will be key in using this curriculum in a meaningful way in the classroom.

Research shows that using the ELL specific strategies highlighted in chapter two of this paper and marrying them with the already beneficial strategies used for the general classroom and single topic subjects like math, science, and social studies will provide exponential academic growth for ELL students. Using a school garden-based curriculum to teach language is a concept which is brimming with possibility for the teacher and/or team willing to put in the passion and effort to make it happen in a real-life classroom context. My hope is that many educators will find this curriculum useful in changing the way we teach ELLs and will be bold in taking the risk necessary to make this school garden-based curriculum successful.

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APPENDIX A – Westervelt Forms of Inquiry

Type of inquiry	Activity	Question	Science skills	Language skills
Directed	Inductive outing,	What is a living thing? Is the Sun a living	Observe, classify,	Speak, read, and write new
	nature journal	thing? What questions do I have about this tree?	predict, record	words; ask and answer a question; write a question
Guided	Multicultural garden	What plants grow in my country? Can they also grow here? How do I find out? Will the Monarch arrive in Mexico?	Observe, classify, predict, gather data, measure, record, analyze, problem-solve	Communicate prior knowledge; write answers; read maps; research; construct chart
Full	ELL science fair	What question can I answer using scientific inquiry?	Scientific inquiry	Write report; oral presentation

APPENDIX B - List of Additional Garden Project Ideas

- Harvest of the month presentations
- Food routes map with deeper explorations
- Cultural farming traditions of the world
- Multilingual explanations and vocabulary exploration
- Create a recipe with items found in the garden
- Learning to read labels for ingredients
- Talking about Social Justice issues surrounding farming and food systems
- Learning to compost and the cycle of regrowth of soil
- Weeding and tending the plot
- Photo journaling of processes and stages in the garden
- Designing of garden beds and layout options and using maps
- Nature drawing and observational drawing
- Taste testing different vegetables and describing through adjectives
- Problem solving through building with and using tools
- Garden tours with community members

APPENDIX C – School-Garden Lesson Plan Template

Timeline & Season	Lesson Timing

WIDA ELD Standard	Area of Focus
Social and Instructional Language Arts Mathematics Science Social Studies	

Standards
3rd Grade:
4th Grade:
5th Grade:

Language Objectives	Vocabulary

Materials	Location

Activities	Extensions