SCHOOL FARM PARTNERSHIPS: CULTIVATING BEST PRACTICE

by
Benjamin D. Johnson

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Examining the current bodies of literature and curriculum in the realm of Garden Based Learning (GBL), little attention is directed toward establishing best-practice frameworks upon which new programs can build. To combat this, a literature review was conducted that explored the successes and shortcomings of GBL programs internationally. With this information, steps were made in order to identify and develop a framework common to an array of programs and curricula that could be utilized to help new (and existing) programs create better learning environments for students and better teaching environments for educators.

This project's second objective was to pilot a program that drew not only from established literature and curricula of GBL, but also from tenets of educational theories such as place-based education, integrative curriculum, and third space. Capitalizing on the fact that every community of learners and educators is situationally unique, a best-practice framework was researched, established, and implemented in a summer school program for junior high students.

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Chapter One: Introduction

Introduction to the Project

To form a viable connection between students and their learning environment, there needs to be a spark that engages a student in learning. Sometimes that spark is an engaging teacher, sometimes it is a student's own interest in a subject/topic. As not all students are interested in the same subjects/topics, another notion is to utilize a medium in which all students are familiar and invested. Although not every student cares for mathematics or basketball, for example, there are a few basic human actions and necessities that are shared by all students. Tracing the important things in human life back to the very start, it is hard to argue that food is not a common bond and relationship that fulfills the most basic needs and being as a human. While not every student has a personal connection to World War II or to the literature of Shakespeare, every student does have a relationship with the ways that they maintain nourishment for their body. Despite a significant variance in opinion and habits regarding food, using food as a universal common ground from which to build an educational program on is the foundation used with the following project.

Although much of this paper examines relevance to both the project and the program, it is important to define the program as the implemented summer school (The Junior High Farm Experience), a portion of the project, (School Farm Partnerships: Cultivating Best Practice) which is a larger umbrella that includes research about creating, assessing, and examining the implications of the aforementioned program. As required for any research work using human subjects, this project went through the appropriate Institutional Review Board (IRB) process. IRB approval documentation can be found in

Appendix A. In accordance with IRB protocol, the identities of participating organizations, universities, and individuals within this document have been changed to maintain anonymity.

This project created, implemented, and assessed a food and agriculture-based junior high summer-school program. Drawing on tenets of place-based education and experiential education, as well as others, this project explored the practical creation and implementation of such a program. This project created a relationship between public education and innovative outside educational programming, provided professional development opportunities for involved public school educators, and provided summer school students an educational setting in contrast to the classroom setting where the students were deemed underperforming. The original proposal and syllabus for the Junior High Farm Experience can be found in Appendix B

The Junior High Farm Experience was implemented as a summer program for credit-recovery students entering 8th and 9th grade. Underperforming students at the risk of failing were required to participate in this summer school program in order to advance to the next grade level. While the curriculum was not initially tailored to specific content areas, dynamic assessment and adaptive management of student needs and abilities guided the evolution of the academic programming over the course of the program in such a direction. The following chapters detail the research objectives, design and implementation, review of existing literature, implications, and outcomes of this project.

Chapter two examines the purpose, rationale, research objectives, and learning objectives (both for student and researcher) of this project. Chapter three provides a brief literature review of garden-based learning. Both academic and practitioner-based

literature was examined in a way that informed the creation, implementation, and assessment of this project. While the nature of place-based education programming is situationally unique, the literature review in chapter three provided other examples and assessments of place-based programs around the country and the world to draw from in creating and implementing a program specifically tailored to the needs and resources of the school district and community. Chapter four draws on the literature and the nature of the public school's relationship with the researcher to discuss the methodology utilized in the creation, design, implementation, and assessment of the Junior High Farm Experience. The final chapter delves into outcomes, implications, recommendations, and conclusions drawn from this project. In addition to drawing connections with the outcomes of the project, this chapter includes reflections on previously published school farm program recommendations, as well as a few best-practice recommendations derived from this project itself.

Chapter 2: Purpose, Rationale and Objectives

This chapter serves to establish and explain the purpose, rationale, and objectives behind the School Farm Partnership program. First outlining the basics principles that provide the foundation for this project, this chapter then dives into the specific details, rationale, and objectives of each aspect of this project.

Purpose of project

The purpose of this study is multi-faceted; it is designed to explore the feasibility of creating partnerships between educational and non-educational entities, provide and encourage teacher development through said partnerships, to provide students with a

beneficial educational experience in their role as program participants, and to implement practical application of researcher-designed programming.

Rationale

By providing a fun and exciting academic experience, students have the opportunity to hold ownership of their academic success in a critical time (middle school) where students commonly either engage or disengage from their educational setting (Eccles, 1999), Not only is this a crucial student population, but these students are at a crucial age where they are learning more (and caring more) about the systems (such as food) that sustain their lives.

By creating a third space (Moje, et al. 2004) that combines personal lives of students (the food they eat, for example) with their academic lives, educational outcomes emerge at a level beyond that of their normal academic lives. Third Space is the culture created between, in this case, school and home. It is a new cultural space that takes the best of both cultures to create a unique and productive learning environment. Academics and education therefore carry more meaning and importance with the injection of each individual student's story and understanding as it pertains to food. As mentioned, food is something that is nearly impossible not to have a personal story associated with, and carried by an individual.

Objectives of Project

Four main objectives were identified by the researcher. They are as follows:

1. Partnerships
2. Educator Development
3. Beneficial Educational Experience

4. Practical Application

Each objective is elaborated upon below. Chapter Five re-examines each of these objectives from an implications and outcomes perspective.

Partnerships

One objective of this project was to act as a feasibility study examining the ways in which educational institutions can partner and utilize external entities to great educational benefit of participating students. Bridging these gaps can be a difficult undertaking. The intent of the researcher was to utilize his research and experience within each entity to create and facilitate a program that paired the needs and educational opportunities of each. Following is more information about the participating farm and school entities.

The student farm is a university-supported entity at a college in the Rocky Mountain West that is student-run and volunteer based. They operate on 1.8 acres of land and utilize sustainable methods to support and promote local agriculture. In addition to providing produce for local markets, restaurants, and events, the farm strives to provide research and educational opportunities to the university, public schools, and surrounding community.

The school district partner operates a public junior high school that has approximately 650 enrolled students in grades seven through nine. The school's mission of "creating multiple and diverse opportunities for student learning" aligns well with the intentions and goals of the researcher, as well as the opportunities afforded by the partnership with the student farm.

Many school districts don't have staff with the skill sets to effectively plan and run a farm-based educational summer program. Likewise, a university-sponsored demonstration farm contains an educational mission, but not necessarily farm staff with the skills

necessary to run a (relatively) complex educational program at the junior high level. By bringing these entities together and challenging each to work with the other in a way that utilized the expertise of individuals involved, the potential for a very effective field-based educational opportunity was created, as well as the stepping stones for a greater relationship to be built between the school district and the farm.

Educator Development

For the benefit of the researcher, the administration, the teaching team, and the farm staff indirectly involved with the students, this project aimed to bring these entities together to take advantage of individual skills and expertise in a way to create, implement, and assess a best-practice program. Putting a researcher with experience and training in place and field-based education practice with classroom teachers provided an opportunity for participating classroom educators to work within a comfortable space to expand their teaching repertoire in a way that better integrated place-based and field-based education principles. Providing an opportunity for interaction between educators and the farmers (including the researcher) maintaining the farm allowed for learning experiences that could increase foundational knowledge for classroom teachers looking to expand their programming into the realms of garden-based education.

Conversely, the researcher and other university student farm employees with less (or no) classroom teaching experience were provided the opportunity to learn classroom-based practices from experienced practitioners that could both benefit their future educational work, and the future educational work done at the farm. At the time of this project, the farm's previous implementation of educational programming was limited to

brief tours and work opportunities with various groups ranging in age and experience from preschoolers to students doing undergraduate and graduate work.

Additionally, working with school district administration, including the principal and vice-principal, provided opportunity for administrators to gain experience in implementing partnerships with experts in other fields that are able to collaborate with their own district teachers to create beneficial opportunities for their students.

Beneficial Educational Experience

Providing a beneficial educational experience was one goal of all parties involved in the implementation of this program. Junior high is an important time of a student's development when they can build or lose interest and investment in their academic career (Eccles, 1999). The teachers and administrators who will work with these students into the future expressed to the researcher their goals of helping the students succeed. The junior high school teachers' and administrators' measures of success were defined to the researcher both as academic success and social success. Catching this particular student group up to national and state standards, as well as academic norms defined by the rest of their peers, was one goal. Allowing these students to build their capacities in positive social interactions with both their peers and the educational and administrative professionals was perceived as a beneficial outcome as well. Providing students with an academic experience they perceived as positive was an intended outcome of this program as well.

The researcher's goal of providing a beneficial educational experience to the participating students was rooted partially in his passion for education, and partly in the frustration of seeing some lack of implementation between the world of academia and practitioners. The researcher felt that his role as an academic researcher is to bring that

research full circle to its implementation and potentially direct benefit to a student population.

The grant funding supporting the district's summer program was unique in that it required innovative programming, asserting that the reason these students were in need of credit recovery programming was that they were not succeeding in the current educational (classroom) environment in which they were immersed, and that this setting needed to be changed in order for these students to succeed. By providing students with a comfortable 3rd space environment (Moje, et al., 2004), the program aimed to meet the funder's request of innovative programing and to remove the negative stigma and connotations of summer school by allowing students to become part of an entity (the farm) that did not carry the stress of school, while still maintaining the academic rigor of a traditional classroom program.

Obtaining student buy-in through a relatable and necessary vehicle was the foundation of this model. Using food, something every human needs, can relate to, and generally enjoys as the overarching theme, the intent was to build a comfortable educational space where all students would, by the nature of the necessity of food, maintain an interest and investment in the program.

Practical Application

The research portion of this study aimed to examine the effectiveness of the program's setting with the use of farm/garden-based curriculum. The curriculum development itself was done by individual educators in a way that capitalized on the instructors' prior knowledge of students and personal strengths. While important to the implementation and outcome of the program, the curriculum design aspect (discussed

further in the methods section of this document) is largely beyond the research objectives discussed here.

The simple act of putting classroom-based educators in a new and unique educational setting, as well as integrating the researcher into aspects of a traditional public school setting was an adequate examination of the ways in which different entities, as well as schools of educational thought, can work together, hypothetically bringing the best of each of their own worlds to create a better, valuable, third-space educational environment. While the school district and the farm existed as individual entities providing educational opportunities, the development of a partnership between the two was a way to bring two distinct schools of education together. Matching the traditional classroom with an inherently hands-on and project-based educational environment of the farm created a space where the students were neither just going to school nor just working on a farm, but rather participating in a new environment that intended to break down their pre-conceived notions about both school and work to create an engaging educational space.

An original purpose of this project, as defined between the researcher and school administrators, was to provide a positive academic experience for students that the administration deemed as being at risk of losing motivation and interest in the future of their education. This program was designed for these students, as students with specific content needs and disabilities were to participate in other summer programming better suited for their individual needs.

One large goal of the researcher with this project was in the implementation of the aforementioned partnership and educational program. While literature is valuable in providing suggestion to practitioners, the researcher perceives a disconnect between

research and practice. By completing a project that bridges that gap, the researcher hopes to provide an example of ways both researchers and practitioners can adapt their practices to create best-practice educational programs that directly benefit the larger communities of researchers, practitioners, and the students they work with.

Chapter 3 Literature Review

Defining Garden Based Learning

Garden Based Learning (GBL) refers simply to the instructional strategy that utilizes a garden as a teaching tool. Although this term (as well as similar terms such as garden based education) has been used intermittently in the literature for decades, it wasn't defined as a theoretical lens until the last ten years. Even then, the definition broadly draws from prior usages and can be interpreted in many different ways (Desmond, Grieshop, & Subramaniam, 2002). Although GBL can be defined and examined as its own theoretical framework, there is indistinguishable overlap with other educational frameworks, such as experiential education and environmental education. Simply put, all GBL is experiential education and all GBL is environmental education. Other theoretical frameworks providing overlap with GBL include service learning, place-based education, project-based learning and interdisciplinary integration.

This literature review aims to draw from existing GBL literature (as well as the related theories mentioned above) pertaining to development, implementation and assessment of farm/garden-based curriculum in a way that identifies and builds upon best practice teaching and curriculum design

Historical Context of GBL

Although school gardens been fairly heavily documented in United States and Europe in the latter part of the 19th century and into the middle of the 20th century (Desmond et al., 2004), the ways in which gardens have been used within education has shifted through different time periods. There are three major eras of garden based learning in the 20th century that have been differentiated (Desmond et al., 2004; Subramaniam, 2002). Progressive education social reform in the early part of the 20th century (up until 1930) fueled the first surge. The second surge (1960s and 1970s) is attributed to counterculture and environmental movements, and the most recent (and arguably current) surge (1990-present) rides on progressive education movements, interest in environmental education, health, and nutrition.

Although these surges and swings are perceived within the practice of GBL, Desmond and colleagues (2002) point out GBL programs outside of traditional academia that do not align with the swings noted earlier research. These include many formal and informal programs, including Future Farmers of America and 4-H, that mostly focus on the vocational and practical application of GBL.

Although this literature review aims to draw from theories and practices of the last two or three decades, the historical underpinnings presented by great philosophers, teachers, and pedagogues including Dewey, Montessori, Steiner, Comenius, Rosseau, Pestalozzi, and Froebel must not be ignored (Subramaniam, 2002). Although the modern school garden is less directly the influenced by these early thinkers, we cannot ignore what they have done at the most basic level of influencing education.

Movers and Shakers: The Contemporary Trendsetters of GBL

The modern garden-based learning program (of the last 20 years) might trace the roots of education gardens back to influential programs and policies such as Berkeley's Edible Garden (Subramaniam, 2002) or California State Superintendent Delaine Eastin's 1995 mandate of "a garden every school" (California Department of Education 2001, 2002; Subramaniam, 2002), and the general increase of interest in community gardens and farm to school programs. The effort of other organizations to bring gardening to the forefront of education also played a part in creating what garden-based learning has become. The American Horticultural Society held a symposium based on youth gardening in 1993 with the mission of recognizing ways in which children's gardens could support educational curricula (Sealy, 2001; Subramaniam, 2002).

Other sectors associated with, but not necessarily directly related to GBL have seen significant growth in the last couple of decades as well: organic foods, community gardens, farm to school nutrition programs, and progressive schools that aim to provide students with a greater range of diverse experiences. While one cannot discount the effects these sectors may have contributed to the popularity GBL, an in-depth exploration into the relevance of those topics is beyond the scope of this paper.

Benefits of GBL

Academic benefit is one of the main outcomes desired in an educational program. It seems like this would be the easiest place to document effects of GBL programs. The problem of this is the very nature of garden-based programs. Just as different classroom science experiences yield different outcomes, different garden programs do exist, inherently contain multiple variables, and do have the potential to provide different outcomes, academic and beyond (Skelly & Bradley, 2007).

Schaidle's (2011) work in compiling and comparing quantitative and qualitative studies provide some of the better assessment of the existing research on student achievement in garden-based programs. Science achievement is a frequent area that has been measured in the garden, by teachers and researchers alike (Blair, 2009). Several quantitative studies have shown increased scientific knowledge (Dirks & Orvis, 2005), achievement (Klemmer, Waliczek, & Zajicek, 2005; Smith & Motsenbocker, 2005; Waliczek, Logan, & Zajicek, 2003), and attitude (Dirks & Orvis; Skelly & Bradley, 2007; Waliczek et al.) scores among students that utilized garden-based programs. Working in this arena also has noted that lower performing students have achieved greater positive change in scientific achievement after garden-based experiences (Boynton, 2010; CDE, 2002).

Environmental attitudes have also been a topic of quantitative GBL educational research study, with mixed results (Blair, 2009; Schaidle, 2011). Studies have found positive significant outcomes in environmental attitude (Bradley, Waliczek, & Zajicek, 1997; Skelley & Zajicek, 1998; Waliczek & Zajiczek, 1997) as well as insignificant results (Aguilar, Waliczek, & Zajicek, 2008).

Numerous other benefits are referenced in the qualitative literature of GBL. In addition to observed academic achievement, many positive social behaviors are documented within this sector of the research (Blair, 2009). These include heightened motivation and enthusiasm, improved self-esteem and pride (Blair, 2009; CDE, 2002; Pittman, 2011; Robinson & Zajicek, 2005; Waliczek, 1997), positive social change (Brooks, 2009), improved student engagement and attitude (Boynton, 2010; Braun, Kotar, & Irick, 1989; Waliczek, 1997), acquisition of life and teamwork skills (Blair; CDE; Robinson & Zajicek), responsibility (Allen, Alaimo, Elan, & Perry, 2008; CDE; Skelley & Bradley, 2007),

community (Allen et al.; Azuma, Horan, & Gottlieb, 2001; Blair; CDE; Langhout , Rappaport, & Simmons, 2002; Rahm, 2002), positive peer interactions (Allen et al.), and parental involvement (Blair; Canaris, 1995; CDE). It must be noted that researchers must (and do) acknowledge the fact that garden-based programs vary greatly (Skelly & Bradley, 2007). Research of other programs suggests that parental involvement does not always improve with garden-based programs (Cooper, 2010), or that many studies linking student traits to gardens provide inconclusive or insignificant results (Smith & Mostenbocker, 2005; Waliczek, Bradley, & Zajicek, 2001).

Although the literature on outcomes of GBL programs is still emerging, and comes from many different fields (Blair, 2009), many case studies suggest positive student outcomes of a variety of type. Blair argues that the benefits of garden-based programs do not come from gardening per se, but rather from the experiential learning nature of garden programs that provide learners with better opportunities to utilize their higher order cognitive skills. Other case studies (Braun, et al., 1989; Canaris, 1995) point to the project-based (Bundschu-Mooney, 2003; Canaris ; Smith & Mostenbocker, 2005; Waliczek & Zajicek, 1999) service learning (Bundschu-Mooney), interdisciplinary integration (Blair, 2009; Bundschu-Mooney; Canaris; Pittman, 2011; Sheffield, 1992; Skelly & Zajiczek, 1998), or place-based nature (Francis, 1995) of a specific program as the core to student success.

Within GBL, parallel strains of literature exist that focus on the food and nutrition outcomes of garden based programs. While the implementation of many of these programs are very similar to what is being discussed here, a complete discussion of food an nutrition based programs was omitted from this review as the outcomes explored within that sector of the literature are beyond the scope of this project.

Challenges of GBL

Despite the focus within the literature on the positive outcomes associated with GBL, difficulties and challenges arise for teachers and schools wishing to start and/or maintain a garden for educational purposes. Major challenges include growing season that do not align with the academic school year, funding and leadership for large-scale projects, and maintenance of garden areas during summer break (Cooper, 2010). Established gardens tend to be run by a few dedicated teachers or volunteers (Blair, 2009; DeMarco, 1999) whose absence could mean an end to the garden. The difficulties faced include acquiring tools, aligning with standards-based curriculum, recruiting parent volunteers (Cooper, 2010), and even just fitting activities into already busy schedules and workloads of teachers (Azuma et al., 2001; Thorp & Townsend, 2001).

Although this is the case most often cited in literature, the California Department of Education claims that, "garden-based education strongly supports and enhances California's academic content standards" (CDE, 2002, p. xii). Thorp and Townsend (2001), on the other hand, suggest that tying gardens to curricular restraints may be a limiting factor that should not necessarily play into decisions about implementation of a school garden.

Many programs studied within the literature are in California or areas with similar temperate climates. Not everywhere in this country has quite the growing season California does, notably the area where this program was implemented. In many areas with more temperate climates, the growing season usually overlaps the end of the school year and the beginning of the next school year. Although GBL programs would have the most success at year-round learning institutions, that would only apply to a tiny number of year-round

schools in this country, or with a great emphasis on GBL summer programming within schools with a traditional (summers off) schedule.

Defining Best Practice

Best practice is difficult to define, at best. So many other factors contribute to the larger system of a garden based educational program. What is the student age and population? What are the existing structures and partnerships in place? What curriculum is being used? How long is the program? Many articles in the literature suggested best-practice methods that would fit their specific programs, climates, resources, staff, etc. That is the nature of experiential education: there is no one-size fits all solution.

One researcher took a different approach in his research. Cooper (2010) looked at the big picture of numerous implemented programs, and distilled his findings into a best practice framework. Using ten themes that can apply to any diversity of garden-based programs, he created a best practice framework that can be utilized and adapted to any program. The ten themes are as follows: Understanding target audience, association with a pre-existing community structure, importance of empowerment, setting holistic goals, effective staff management, consideration of key stakeholders, program structure, seasonality considerations, security of funding, and utilization of garden education literature. The implications of each of these themes are discussed and elaborated within the context of this project in chapter five.

Chapter 4 The Junior High Farm Summer Experience

The original idea behind this project was to take a summer school program from start to finish. The intent was to complete the legwork of selling a program to a school, designing the curriculum, working with other teachers (and students) to deliver the

curriculum, and assess the program. This chapter provides an overview of the multi-faceted process of developing a partnership and implementing a summer program.

Planning

Upon contacting the junior high principal with the idea of running a farm based summer school program, the principal and the researcher sat down to discuss ideas and details over the course of several months. Along with the school district science coordinator, the needs of this project and the needs of the district (in terms of summer programming) were distilled into a mutually agreeable proposal.

As summer approached, additional teachers were brought into these meetings, to both gauge interest and add to the conversation about what this program should look like. By encouraging this discourse, the program was built with input from all parties that would be investing in both the implementation and the education of the students beyond summer programming. By the start of summer, a team of three teachers (as well as the researcher) was in place to implement the summer program.

The framework for this curriculum was based on research of similarly implemented programs found within the literature, as well as theoretical literature identifying challenges, successes, and offering best-practice suggestions. This project did not specifically address the creation of curriculum or individual lessons, but rather provided a framework and a canvas on which to jump off from (and work within). Teachers (including the researcher) were able to utilize this framework and canvas to develop lessons independently, and in a way that provided them with creative freedom and ownership of the lessons contained within the program, as well as the ability to adaptively manage for

the specific needs of the student population. This framework is contained within Appendix C, and elaborated upon in the *Curriculum* section of this chapter.

It was decided that the research (implementation of the summer school program) would take place at the junior high school the students attend, as well as the nearby farm, an entity of a university in the Rocky Mountain West**.** Students participated in both classroom and farm-based educational experiences over the course of four weeks in July of 2012. This summer school program was the only credit recovery summer school option available to students at this middle school.

Educator selection/recruitment

Educators were selected by the school district administration based on their interest in the program, their availability for the duration of the program, and the applicability of their area of educational expertise. Ultimately, a group of three teachers and one administrator worked alongside the researcher to implement this program. This included educators with expertise in mathematics, language arts, and business.

Student selection and population

Students voluntarily entered this program, although they were referred under the recommendation of the school district and their teachers. This program served the dual purpose of providing credit recovery to students, as well as providing enrichment for students who were not in need of credit recovery. The nature of the district's enrollment procedures dictated that the exact number of students, or identity of students, would not be known until the first day of the program. Ultimately, ten students entered the program and nine students completed the program. Two students entered the program as

enrichment students. The other eight students entered knowing that they needed to complete this program in order to continue to the next grade level.

The challenges of this setup were numerous. The researcher was prepared to design curriculum that addressed (to an extent) the specific needs of students. He was provided with 60 individual learning plans from the district and told that all or none of these students could show up on the first day. These sixty students represented students that were required to attend in order to continue to the next grade level, and students that were strongly recommended to attend (but not required in order to continue to the next grade). This made planning for the student population extremely difficult. It also provided the teaching team the challenge of meeting the needs of ELL students, which was unexpected and unable to be supported by the district to the extent that an ELL student needs.

Curriculum

The curriculum aspect of this project became two separate entities as it moved from planning to implementation stages. As with the nature of a newly implemented program, plans evolve to accommodate the needs of all involved parties (researcher, administration, teaching team, students). This happened as the teaching team assessed the academic needs of the incoming students. The original academic goal (established by the researcher and the administration) was to provide students with a positive and enriching academic experience that contributed content knowledge in the areas where students may have fallen behind. Upon determining the student population at the start of the course, the administrator working with summer programming, the teaching team, and the researcher decided that many students had individual academic needs that needed to be tailored to in more specific academic areas.

The original goal of this curriculum was to provide a positive academic experience that provided students with no summer gap in their learning habits, as well as to reinforce topics in subject areas where individual students may have been lagging. This original intent was reinforced through discussions with the school district's summer program coordinator, and the principal at the junior high school. The proposed curriculum can be found in appendix B. The implemented curriculum can be found in Appendix C.

Part of the goal behind this was to be able to accommodate and tailor instruction to the varying levels of knowledge base, interest and/or remediation that was expected from a very diverse group of students. Additionally, this was designed to provide flexibility for working with both credit recovery students and enrichment students.

As previously mentioned, the school district's enrollment process, the exact student body participating in this summer program was unable to be determined until the first day of class. The hope was to have an early idea of the student population (enrichment vs. credit-recovery, specific remediation, etc.) in order to tailor lessons and activities towards specific needs (and interests) of individual students. An example of this would be assigning certain students particular tasks within larger projects (such as doing the budget aspect of a business plan group project, for example) that were specific to their credit recovery needs and/or academic interests (in the case of enrichment students).

The immediate challenges faced by the teaching team related to the performance levels of our incoming students almost immediately rendered many of these plans not adequate to address the specific academic needs of certain students. For example: mathematics were written into a business plan project, the measurement associated with a

scientific research project, and some of the tasks associated with preparing the produce from the farm for a day at the farmer's market.

The reality was that this was not going to provide the specific mathematical skills (for example) needed to pass standardized exams associated with matriculation to the next grade level (such as multiplication and division of fractions). These students were entering 8th or 9th grade, and many had math proficiency skills at the 3rd or 4th grade level. Within the teaching team, it was decided that this needed to be addressed proactively, and that the mathematics written into this program's curriculum would not cover enough of a range of topics for some of the students with low mathematical achievement. In fact, many of the mathematical skills would be extremely difficult to convey using the original idea of an integrated farm project-based curricula, at which point we reverted to spending an allotment of time on direct instruction of specific mathematic and reading topics that targeted the specific needs of individual low performing students.

The curricular/thematic framework and daily schedule utilized in the implementation of the Junior High Farm Experience can be found in Appendix B. While an adherence to the initial thematic progression was attempted, the program actually implemented more closely resembled repetition of the daily schedule found within the later schedule found in Appendix C; fewer thematic threads created a lack of a greater progression and coherence as initially intended with the project. While the initial intent was to have every academic activity relate to a hands-on or theoretical experience having to do with the farm, the adaptation of curriculum to meet specific academic needs of individual students hindered the ability to implement the planned integrated curriculum with a strong thematic progression.

As one can see in the detailed daily schedule found in Appendix C, the curriculum focused around a few ongoing projects (phenology project, scientific research project, business plan), and supplemented those projects (that were largely farm based) with reading and mathematic work that was unable to fit into the integrative curriculum. Although the program started with using the farm as a primary classroom (85% or more of the day), by the end of the second (of four) weeks of the program, the farm was being used for a classroom about 50% of the time, and the classroom at the nearby junior high for the other half the time.

Student Assessment

Due to the nature of the changing demands provided by this program, much formal and informal assessment was done on the individual level. With the majority of the students set on different tracks dictated by their remedial needs, it was difficult to assess academic improvement across the board. Some individual assessments of achievement include the following: Students that had failed their final math exam during the course of the school year re-tested with passing grades. ELL student English language skills improved over the course of the program, and student engagement, the amount they were writing in their journal, the amount of data they were recording also increased over the course of the program.

Teacher Assessment

Faculty working the program (n=4) were provided with a program assessment survey to help the researcher determine the effectiveness of the program. This survey can be found in Appendix D. With a response rate of 50%, feedback present in all returned surveys included discussion that the researcher has distilled into the following:

- Difficulty working in out of classroom environment for instructors
- High interest in working in non-traditional settings
- Some positive student outcomes in outdoor setting
- Difficulty adapting certain academics to farm/place-based theme
- Doubts about resilience of a program that includes many facets (including partnerships with multiple entities, educators with niche skill sets)

The lessons learned from the implementation and assessment of this program are quite wide-ranging. While some were discussed in this chapter, the following chapter examines these through the organizational structure introduced in Chapter Two.

Anecdotal evidence supporting educator outcomes.

The following section, as well as portions of the next chapter, includes text referred to as "Anecdotes." These sections are intended to relay the researcher's personal observations as they relate to his experience, observations, and reflections of the program.

Anecdote 1. One faculty member held the strong opinion that the book used as a text (Paul Fleishman's, 1997, *Seedfolks*) should absolutely not leave the physical classroom, for fear that the perceived harsh environment of the farm would destroy the book set, despite the fact that the farm did provide indoor space to protect from the elements

Anecdote 2. The teachers with more classroom experience faced a challenge in needing and transporting classroom materials to the farm site. Unless carefully thought out and planned for, very few teaching materials were available on an as-needed basis when working at the farm site. There were numerous times when a teacher would say "I wish I had brought (blank)." It was not a very easy transition to a classroom with a different set of physical resources.

Anecdote 3. Multiple teachers felt that the desk was the best place to do work or to read, and that allowing more space to roam wasn't providing enough student accountability for staying on task. Because of this, much of the student work (tests or worksheets, for example) was accomplished in the classroom.

Anecdote 4. Utilizing large pads of paper on an easel and small whiteboards on the farm was not as easy as the single large classroom whiteboard that was in the classroom.

Chapter 5: Outcomes and Implications

This chapter contains three major sections. The first section examines the project's success at creating the third space as defined by Moje and colleagues (2004) that was introduced in Chapter Two. The second section uses a framework from previous literature to examine the successes and challenges of this particular program. The third section re-examines the objectives defined in Chapter Two, and draws on discussion from the first section of this chapter to discuss the outcomes of this project.

This program intended to create a third space environment that brings together the discourses between a student's home life and school life. As these discourses are often separated (Moje, et al., 2004), the intent was to create an academic space where students would be comfortable in bringing in and utilizing a large part of their home discourse in an academic setting. Certain shifts in the planned and implemented structures of the program both reduced the prevalence of a home discourse and increased the prevalence of a school discourse (i.e. through direct academic instruction not thematically tied to the operation of the farm). Despite this, anecdotal observations indicated that the students had found some sort of a third space, where they were able to overcome some of the challenges they had

previously encountered in classroom environments, and incorporate a higher level of participation drawing on the learning experience obtained in a home environment.

The following section of this chapter examines the implications of this program through a previously published academic study that identifies ten best practice recommendations (Cooper, 2010). Using Cooper's analysis as an outline, the implementation and outcomes of this specific program/project are examined and commented upon. The ten best practice topics are as follows: Understanding target audience, association with a pre-existing community structure, importance of empowerment, setting holistic goals, effective staff management, consideration of key stakeholders, program structure, seasonality considerations, security of funding, and utilization of garden education literature.

Best Practice Recommendations

Understanding target audience

The originally envisioned student population turned out to be much different than the actual student population that was encountered on the first day of the program. Knowing that the program was catering to the expectations of summer-school students was an important starting point. Expecting students with low motivation and expectations was a challenge right off the bat. A different mix of enrichment/credit recovery students would have driven the program in a completely different direction. Working with a small group of students from a relatively small student population allowed the teaching team to have a good idea of where the students were coming from, based simply on prior interaction with students, and the general student demographic from which they were a part of.

Anecdote 1. Two English Language Learners (ELLs) came to the first day of the program. Collectively, the teaching team had no training or experience working with ELLs. Both of these students came for the enrichment portion of the course, one specifically to be immersed within and learn English, and the other to practice her basic language skills and to have peer interactions in an environment with fewer students. The former did not return on the second day, or any subsequent day.

Anecdote 2. One student in particular had previous major behavioral problems with one of the teachers. Knowing this, and knowing some of this students particular coping mechanisms and behavioral ticks was crucial for working with this student in a way that was beneficial to him and the rest of the class.

Association with a pre-existing community structure

Having the existing structures of a school's summer program and a working farm/garden was crucial to the success of this program. Creating a program similar to this one without either of those pre-existing entities would have been a difficult and prolonged undertaking. Even creating a similar program with only one of the two entities would have presented significant challenge.

Anecdote 1. Having the garden as an entity that operated completely outside of the school was a boon to the program; there was no requirement that the students focus attention on certain minutia of starting and/or running a farm/garden. With or without the students, the beds were going to get weeded, vegetables were going to be harvested, vegetables would be sold at the farmer's market, etc. The students' help was beneficial to the farm/garden in many of those areas, although the operating plan of the farm/garden did not carry the expectation of student labor. This allowed the program to focus on the

main objectives as defined by the researcher, teaching team, and the school district: those focused around education.

If the garden was a school-run entity, as many schools currently have, a larger focus would have to have been allocated to basic upkeep and operation of the garden, while our partnership with the existing structures of a university-supported farm/garden allowed our program to focus on the aspects of the farm/garden we felt was most important.

Anecdote 2. The pre-existing structures of the school district's summer programming meant that the teaching team did not have to spend time recruiting students or worrying about enrollment.

Importance of empowerment

One intention of this program was to give students responsibility and ownership of their classroom, providing them with an opportunity to feel comfortable and necessary as a cog in a working machine they were both contributing to (work) and benefiting from (food, education). The schedule of the program (see appendices) also was based around providing students with more freedom and responsibility as the course progressed.

As discussed in seasonality considerations, some difficulties in obtaining the desired levels of ownership and empowerment arose. Gardening is a process that one must really spend a whole season or year to obtain full ownership and understanding. The nature of a month-long summer program is that students are unable to fully participate in all aspects of what actually happens in a garden. Yes, they are able to prepare beds and plant seeds, tend for plants, and harvest. Being able to see the full cycle of an individual plant would be a much more empowering experience.

The students were never able to see the seeds they planted become a harvestable plant, and had no initial investment in the plants that they were harvesting. They were harvesting someone else's carrots and were planting salad greens destined for someone else's pruning, harvesting, and consumption as well. Ideally, the term of a program would be from the beginning of the growing season to the end of the harvest season, which was absolutely not feasible for a credit-recovery school-district sanctioned summer school program.

Anecdote. One student tentatively asked one time, "Can I eat this? Whose is it?" The intention was for it to be theirs, but not all students were able to easily grasp on to this ownership.

Setting holistic goals

As discussed previously when addressing the topic of target audience, this particular program had major shifts in educational objectives that made addressing the originally intended holistic goals take a back seat to the immediate grade-driven goals of students attempting to enroll in the next grade level. As with the nature of experiential education programs, it is extremely difficult to assess some of the holistic goals of a program in such a short time period. In the researcher's practice as an environmental and experiential educator (within and beyond this particular program), one intent is to plant a seed by facilitating an enriching experience with students. This seed may take quite some time to come to fruition (if it does at all), which is a time period often well beyond the scope of an individual program, and even beyond the scope of the research and assessment done within a program.

The measurement of holistic goals, unfortunately, is far beyond the scope of the research associated with a pilot program. These holistic goals can be established and worked toward in every way possible, but cannot be fully assessed without tracking student's progress over a long time period.

Anecdote. The only grades/feedback/assessment (measure of success) provided to students were ones that were associated with their achievement in specific credit recovery areas, as that was the measure necessary to accomplish the students' goal of the program: passing into the next grade level.

Effective staff management

Having partners that were well versed in the individual entities of the school district and the farm/garden provided individual expertise, as well as the appropriate support structures associated with each entity. Contrarily, staff members recruited for participation in the implementation of the Junior High Farm Experience were not well-versed in gardening or field-based education, and the program depended heavily on the niche skill set and interest of the researcher. The presence of farm employees that could fill in and supplement the skill sets of the teachers when the students were working collectively was beneficial as well.

Anecdote. I, the researcher frequently explained and demonstrated garden skills to the entire group (including teachers) in a way that I knew the other teachers could easily pick up those skills and subsequently teach the students those particular skills. As these skills were ones that I alone held, my role in conveying skills not only to the students, but the teachers as well, was crucial to the success of the program.

Consideration of key stakeholders

Though primary stakeholders have been thoroughly discussed in other areas of this document (the partnering institutions and the researcher), much potential for integration of other key stakeholders within the local food and education community were underutilized due to the constraints of time and scope. While many of these parties (such as the university, the local food group, farmer's market, soup kitchen) would not be considered key stakeholders, bringing them in in a partnership capacity could have been mutually beneficial and established more significant roles as key stakeholders. Another discussed stakeholder that was not utilized were the families of the students.

Anecdote. The idea of bringing students into the operations of the farm in a more holistic way (such as participating in the farmer's market or taking field trips to other local food entities) was discussed with the administrators of the program, but was hindered by logistical and liability issues centered around time and transportation (and cost of transportation).

Program structure

As mentioned, this program was dually structured around the school district's summer program and the local university's student-run farm. Although a longer-term program would provide more of a holistic experience, the available structures were utilized to the best possible degree to create a structure unique to the available resources of the particular situation. The existing structures made the creation of the program go fairly easily, although without a keystone, such as the researcher, this program is unlikely to continue in a similar capacity. On a more detailed level, the original intended structure of

the program (see appendix B) was modified heavily to accommodate the diverse academic needs of individual students (see appendix C for implemented schedule).

Anecdote 1. All of the garden-based skills were taught by myself, the researcher. While the teachers and administrators were committed to the structure of the program, it was my familiarity with the university student farm that really facilitated the relationship with the school district.

Anecdote 2. Without the continued involvement of the crucial bridge person, the likelihood of the a continued partnership is slim; there were no other parties that were both well versed in the university student farm that held an interest in putting in the energy to maintain a relationship or continued programming with the school district.

Seasonality considerations

Setting up a program that has to run in the summer (the nature of summer school) is great for aligning with the time of season when lots is going on in the farm/garden. Students have opportunities to see many of the aspects of what goes on. Ideally, a longer-term program would give participants a better understanding of how the larger system works, as well as provide more ownership and accountability (as discussed previously). To pick a single month, the summer months work the best. As discussed further in the section examining the utilization of garden education literature below, the short growing season of a high elevation, Northern latitude area places a significant strain on the opportunities to utilize the garden as a teaching tool to the degree that it can be used as a teaching tool in areas with less severe climate or longer growing seasons.

Anecdote. Students planted pumpkin seeds as part of a project to document the phenology of the species. Many seeds had barely sprouted and/or the plants were very small at the time when the course ended.

Security of funding

Utilizing an existing summer school program mandated by the administration, there is always guaranteed funding for teaching staff, one of the predominant problems facing many garden-based programs. The university student-farm utilized in this partnership is largely volunteer-run, and there was no farm-based funding allocated to the summer school program. While some volunteer assistance was necessary to help students participate in farm activities, the students' presence on the farm/garden did not require any additional funding or volunteer necessity beyond the normal operation and capacity of the farm/garden.

An important aspect to this program to distinguish was the researcher's secondary participation and leadership within the student farm. As the farm manager (and influential leader at the farm), as well as the program coordinator of the school district's summer program, the researcher was able to prioritize the educational opportunities that are part of the student farm's mission. A leader with less interest in education might have created a setting where setting up a partnership like this would encounter difficulties in bridging the gap between the university run farm and the school district.

Anecdote. The school districts funds allocated toward teacher salaries for the one-month program exceeded the student farm's budget for the entire summer. There is no way the student farm would have been able to fund positions such as these.

Utilization of garden education literature

Much garden education literature is written for specific programs, or specific types of programs (e.g. after school programs, summer enrichment programs, classroom science units, etc). The nature of this program is unique in the fact that it works with credit recovery summer school students who (individually) have very specific academic needs. While certain literature was crucial in the planning and implementation of this program, this program largely benefitted from generalizations gleaned from various garden-based literature, with many specifics being too narrowly relevant for other specific programs or geographic areas.

Implementing a garden-based program at a high elevation northern latitude is a challenge that is infrequently explored within the literature. The simple nature of this program's geography dictated that certain things be drastically different from many of the programs that are prevalent in the literature. Many (if not all) programs studied within the literature are in areas of lower elevation and/or lower latitude, providing said programs with substantially longer growing seasons, growing seasons that align with the school year, or otherwise provide more abundant opportunity to utilize a more broad range of happenings within the garden in a program.

Anecdote. No literature discussing using a garden as an educational setting for credit recovery programs was found in my literature review.

Outcomes and Reflections as an Educator

The four major objectives first introduced in Chapter Two are as follows.

1. Partnerships
2. Educator Development
3. Beneficial Educational Experience

4. Practical Application

The remainder of this chapter examines each of these four areas from the perspective of the researcher, then integrates the previous section of this chapter to explore the implications of this project within the literature and beyond.

Partnerships

Though the implementation of the Junior High Farm Experience created a partnership that was mutually beneficial, no lasting or continuing partnership was established. Simply showing that it could be done successfully was an original intent of the researcher. While a continued partnership (and implementation of some form of the Junior High Farm Experience) could be a beneficial direction, it is not something that came out of this project. From my standpoint, simply creating (and gaining the experience of creating) a partnership was an accomplishment. Being the glue, so to speak, that held this partnership together, I see how easily it is to create partnerships, but how difficult it is to maintain partnerships. Had I the opportunity to continue to work in a capacity with one or both of these partners, this is a partnership that could have continued to grow and improve. With no other individual with the skill set and interest that first facilitated this unique partnership, it did not last.

Educator Development

This is a difficult outcome to assess, based simply on the timescale of the project and lack of long-term follow-up. Opportunities were provided for educators working within the school district to develop their skills in non-traditional environments (feedback [see chapter four] indicated this was a challenge). Opportunities for farm volunteers to interact with students were also provided, but the assessment of the effect of that is beyond the

scope of this research. As the researcher, I gained significant insight into the joys and challenges of facilitating partnerships, working with other educators, and implementing a pilot program. With a background in field-based environmental education and smallscale agriculture, I was able share my experience, knowledge and techniques with the other educators. Simultaneously, I was able to put a large amount of theory into practice, where I adapted learnings from previous experiences to fit the unique nature of this program.

Beneficial Educational Experience

This is a difficult measure, due again to the lack of long-term assessment of students. Student feedback was positive, but as in the case with many educational programs, it is very difficult to assess the long-term (or even short-term) benefit of a short-term experience. Almost all students completed the program (9/10), and thus were able to continue to the next grade level. The student that entered but did not complete the program was an ELL student that did not return on the second day of class, and who the teaching team did not consider an appropriate candidate for this program in the first place. The data on passing rates of summer programs from years past is not available to the researcher, so it is difficult to compare this program to the success of programs in years past.

One distinction I would like to note is the benefit of passing grade level. The curriculum and teaching strategies implemented to achieve this goal were well outside of the intent for this to be a holistic program. In fact, an underlying motive of the nature of garden based education is to provide this hands on holistic experience that I see as the antithesis of the current educational systems of teaching to the test. While portions of this program strictly were that project based hands on learning that I speak of, portions of each

day were also devoted to the complete opposite style/method of teaching: sitting in a classroom and practicing the specific skills needed to pass the test that is needed to continue on to the next grade level. A discussion of how these rival educational methods worked together can be found at the end of appendix C.

Practical Application

The researcher is very pleased with the larger outcome of this project. The opportunity to take an idea of an educational program through the entire process (design to implementation to assessment) was a powerful and beneficial experience. Being able to take theory and literature and utilize it in an on the ground educational program was an accomplishment of this project. Beyond the Junior High Farm Experience, both the researcher and teaching staff have new educational experiences to draw from as they continue their careers as educators.

Summary and Implications

While the objectives of this project were met to varying degrees, there remains substantial room for improvement. As discussed in earlier sections of this chapter, many lessons were learned that would contribute to better design, implementation, and research of a similar program in the future. Reflection of this project showed that only pieces and parts of current GBL literature could be fully utilized in creation of the program and project discussed. Likewise, the possible implications of this project in the context of garden-based literature are similar. The researcher hopes that this project will serve to document the diverse nature of partnerships, educators, students, and educational programs while providing some guidance in the realms of educational research and practice. This project reaffirmed old challenges faced by practitioners and researchers, as well as identified new

ones for future practitioners and researchers, who will have a greater perspective on the nature, challenges, and successes of implementing a new program in the realm of GBL.

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Appendix A: Institutional Review Board Approval

Dear Mr. Johnson,

The IRB proposal "The XXXX Curriculum Project, A Place-Based Approach to Garden Education" has been approved as expedited review because data is being collected for research purposes with minimal risk. IRB approval for the project/research is for a one-year period. If this research project extends beyond ***June 21, 2013***, a request to extend the approval accompanied by a report on the status of the project (Annual Review Form) must be submitted to the IRB at least one month prior to the expiration date. You may proceed with your project. A hard copy is being sent to you.

We appreciate your keeping the Board apprised of your activities. Please feel free to contact me if you have any questions. Please notify the IRB, IRB@uwyo.edu if there are any changes in the protocol as expedited. Our expedited review and approval will be reported to the IRB at their next convened meeting September 20, 2012.

Good luck with your project!

Sarah Schulmeyer

University of Wyoming

Office of Research and Economic Development

Dept. 3355, 1000 E. University Ave.

Laramie, WY 82070

307-766-5322

Appendix B:

Junior High Farm Experience

Proposal Documents

Ben Johnson

PHONE (406) 381-1794 • E-MAIL BEN.JOHNSON.MT@GMAIL.COM
914 E KEARNEY ST • LARAMIE, WY 82070

12/07/2011

Dear XXXXXXX

I am an experiential educator completing my master's degree in Natural Science Education and Environment and Natural Resources at the University of Wyoming. After a year-long immersion experience at the Teton Science Schools teaching field-based ecology and sustainability, I am hoping to apply my teaching skills in the context of public education. Through my work with Joel Pontius and the Science and Mathematics Teaching Center I have become interested in developing experiential programming for middle level summer school students. I have worked with Joel to develop the proposal that follows.

I look forward to discussing this proposal in further detail in the future. Please feel free to contact me with any questions you might have. Thanks in advance for the reply.

Respectfully yours,

Ben Johnson

Proposal for Summer Middle School Program
XXXXXX County School District
Ben Johnson, M.S. Candidate, University of Wyoming

Students in the Garden

People love growing and eating food. These are innate instincts linked to human survival, well-being, and happiness. Relatively recently, humans have shifted away from a food system that once provided physical and mental sustenance, meaningful work, connection to place, and an intimate knowledge of the human and ecological communities surrounding them. More recently, schools have been coming back to the garden and local food systems to engage young learners in the art of growing, harvesting, and eating real food.

In the summer of 2012 I would like to implement a farm/garden-based summer school program for middle school students. Applying the tenets of service-learning, project-based learning, and place-based education, students' educational experiences will be carried out through meaningful work and academic study on a student farm run by the university.

Precedence of farm/garden education

The term garden-based learning (GBL) has only come into use in the last decade, and although the academic literature on the topic is emergent (see Blair, 2009), literature and case studies that exist point to increased scientific achievement and food/nutrition behaviors, as well as a wider scope of desirable outcomes, including: positive social and environmental behaviors, psychosocial development (e.g., responsibility, self esteem), behavioral engagement, and motivation to learn.

Program reports of GBL experiences also report improved sense of pride and belonging, attitude toward education, naturalistic and emergent scientific inquiry, teamwork, and student bonding.

The nature of GBL favors interdisciplinary integration, place-based education, and project based, hands-on, and service- learning. Rigorous academic research and applied teaching in each of these disciplines has shown to improve academic achievement, increase happiness, foster an acquisition of practical skills, and promote appreciation of place, community, and education.

Program objectives

(some adapted from Desmond, Grieshop, & Subramaniam, 2004 and Subramaniam, 2002)

- Provide students with meaningful core academic experiences tailored to and determined by individual interests
- Foster students' sense of place within the Laramie community, their school community, and in local and global food systems

- Engage students in self-directed learning, responsibility, and academic engagement through student-designed projects and practical real-world responsibilities.
- Teach basic skills and vocational competencies
- Promote ecological literacy and positive social and environmental behaviors
- Add a sense of excitement, adventure, emotional impact, and aesthetic appreciation to education
- Increase health and nutrition awareness

Desired student outcomes and skills

The program objectives listed above provide us with desired outcomes and skills for each student. Among these are academic achievement, responsibility, self-awareness, critical thinking, scientific reasoning, and cooperation.

Manifestation of these skills comes in many different ways: Academic achievement from the literacy skills gained maintaining and presenting a written phenological record; responsibility from preparing a snack for the class or picking and washing a vegetable that will ultimately be sold as food; critical thinking from the challenge of utilizing mathematical measurement to plant a bed of carrots; scientific reasoning from analyzing the best methods of watering and fertilizing a growing tomato plant; cooperation from working as a group to come up with the best business plan to market an oft-overlooked vegetable like chard or kale. These are skills students are applying to real-life situations, and skills they can walk away with and continue to beneficially utilize academically and personally.

Proposed Schedule

The purpose of this program, broadly, is to engage students in meaningful knowledge, confidence, and community-building experiences in Laramie. The following schedule is meant to provide a broad framework we can collaboratively work within to meet student-learning goals. This proposal is meant to work within and accommodate the needs of Albany County School District's summer programming objectives. Common Core State Standards (corestandards.org) and National Science Education Standards (nsta.org) can be utilized as a baseline for lessons and activities implemented within this program.

Weekly Themes - Progressive unifying themes that maintain an integrated approach academic material

Week 1: Welcome to the farm: Getting to know this place and what we do here.
Week 2: Understanding the food system: Where does this farm fit into Laramie and into the food system? Where do you fit into this?
Week 3: Being part of this community: Service learning; what can you do for this place and your community?
Week 4: Becoming part of something: You are in charge. What can you accomplish?

Daily Schedule - TBD progressive unifying daily themes that maintain an integrated approach to academic material

8 am: Students arrive at farm, morning meeting to provide objectives and plan of the day
8:15 am: Chores/warm-up tasks
8:45 am: Assigned reading/writing time
9:30 am: Lesson/activity
10:00 am: Break
10:15 am: Lesson/activity
10:45 am: Apply lesson/activity to projects
11:30 am: Project discussion/reflection
11:50 am: Daily wrap up, assign reading/homework if necessary
12:00 pm: Dismiss

Student Assessment

Student assessment pieces could include a cumulative journal (with reading and writing assignments), group and individual task challenges, and implementation of student-directed mini-projects. All of these assessments can be designed to meet appropriate educational standards.

APPENDIX C
IMPLEMENTED SCHEDULE

Week One (July 9-12, 2012)
Theme: Land and Soil **Guiding Question: What are we working with here? What makes this place?** **Learning Objectives:** 1. Students will understand the basic culture and processes involved in the ACRES student farm 2. Students will begin to observe the changes that take place over time on the farm 3. Students will understand and explore their previous knowledge of inputs and outputs involved in growing food on the local scale, as well as on the global scale 4. Students will understand the scientific processes involved in growing vegetables. This includes the carbon cycle, photosynthesis, and the water cycle.

Monday, July 9

Theme: Welcome to the farm!
Guiding Question: What questions do you have?
Learning Objectives: Understand the different aspects of what ACRES does and how it runs. Understand course objectives, activities, syllabus, etc. Begin recording reactions and observations of farm, as well as formulating hypothesis to questions that arise (to be explored and answered later).

Activities/Lessons/Schedule:

Introductions and orientation @ school (8:00 to 8:45) Ben

- Silly game to get kids loose and comfortable
- Introductions – of students and instructors – favorite/least favorite food, what you want to know about food, some other fun item
- "Teacher Torture" students get to pose questions to instructors in order to set tone of program
- Overview of syllabus, rules and expectations
- Walk to farm

Initial observations journal prompt and farm exploration (8:45 to 9:15 or 9:30) Lisa

- Spend 10-15 minutes exploring the farm individually and <u>silently</u>

- Find a place to sit down away from others and respond to these prompts: What do you notice about this place? What is your first impression and initial reaction of the farm? (15 minutes)
- Share (optional for students)

Detailed Farm Tour (9:15/30 to 10:00) Ben

Break for snacks (farm food! 10:00 to 10:15)

Culture of the farm – work! (10:15 to 11:00) Ben

(thinning carrots and salad greens, weeding)

Brainstorm and introduce big project (11:00 to 11:45) Ben

- Introduction of scientific method
- How have you used the scientific method recently?
- What are ways you could use this process to answer a question about the farm?
- Introduce some "ready" project ideas
- Student brainstorm of projects they could implement

Wrap up day, return to school (11:45 to 12:00)

Tuesday, July 10

Theme: Science Day! Observations and questions
Guiding Question: How do we do science? How can we do science on the farm? What tools do we need and utilize?
Learning Objectives: Students will focus on observation skills as the first step of the scientific process. By working on observation skills, students will be able to better understand specific aspects of the scientific process and begin to put concepts together.

Activities/Lessons/Schedule:

Walk to farm, morning warm-up (silly game/activity) (8:00 to 8:30)

Observation Skills (8:30 to 9:00)

The more the look the more you see (game) – 15 minutes

Examine species accounts (Ben has hard copies) – brainstorm the traits one might record when documenting a specific plant.

Begin Phenology Project (9:00 to 9:30)

Reiterate the importance of observation skills. Students will each select and mark a plant that they will monitor for the remainder of the summer program. Students will create a

"species account" of this plant and take initial observations based on the traits they came up with earlier (size, color, leaf/fruit type, etc…)

Also begin a KWL chart for student's plant – filling in a few Knows and Want to Knows

Journal entry: Detailed Descriptions (9:30 to 9:45)

In addition to creating a species account, students will write a detailed description of "their" plant. These will be traded with other students so the other students can attempt to identify the plants described.

Fill in additional sections of KWL chart

Break/snack (9:45 to 10:00)

How Plants Grow – the Science of Photosynthesis (10:00 to 10:30)
Lesson from "Get Growing" book (Ben has materials)

Asking questions (10:30 to 10:45 or 11:00)
Based on the W from the student's KWL chart, we will begin to ask relevant questions about the plants we are examining, hopefully leading us to individual research questions

Work (10:45 to 11:30) Thin/transplant lettuce and continuing to thin carrots that haven't been

(Emily can take students back to school to work on math at this point as well).

Wednesday, July 11

Theme: Math and Business
Guiding Question:
Learning Objectives:

Activities/Lessons/Schedule:

Walk to farm, morning warm-up (silly game/activity) (8:00 to 8:30)

Assist in Harvest (8:30 to 9:30)

Introduction to business models (9:30 to 10:00)

Problem: Financing the start of a small farm operation

Students work in small groups to determine how they might acquire the startup funds for a small business

Explain our model of the CSA… what they are and how they help the farm

Break/Snack (10:00 to 10:15)
Phenology Project Monitoring (10:15 to 10:30)

Students will continue to fill in new things on their KWL charts

Articles on young entrepreneurs (10:15 to 10:30)
Students will read short articles on young entrepreneurs (a total of four articles between the group), then share the main points of their article with the rest of the group

Writing a business plan (10:45 to 11:30)

Pick an aspect of the farm (or of hypothetical food production elsewhere) and begin work on a business plan.

(Janet and Emily - would love to talk to you about some ideas you may have, as well as how we can better integrate the specific math skills students need into this lesson)

Thursday, July 12

Theme: Food Cycle – inputs and outputs
Guiding Question: Where does our food come from and what is involved in getting it to us?
Learning Objectives: Students will understand the complexities involved in the food system, as well as all the additional inputs and outputs involved with the production, transportation, and distribution of food across America.

Activities/Lessons/Schedule:

Walk to farm, morning warm-up (silly game/activity) (8:00 to 8:30)

Work/Chores (8:30 to 9:30)

Phenology Project Monitoring (9:30 to 9:45)
Students will continue to fill in new things on their KWL charts

Food Cycle Tracking (9:45 to 10:00)
Students will choose a food item they perhaps had for breakfast or dinner and make a map "following" that item from its source to when they consumed it. Examples may be as simple as lettuce from ACRES to as complex as a can of soup or a pop tart

Break/snack (10:00 to 10:15)

What the World Eats Poster Comparison (10:15 to 10:45)

Using the WTWE poster set, students will examine the differences in diets, spending, etc from around the world. They will draw ties to the food systems diagrams they came up with, and also

Science Project Meetings (instructor w/ groups of 3-4) (10:45 to 11:35)
Students will finalize a research project question, hopefully drawing from their KWL charts and the input of instructors and other students. Several possible research ideas will also be able for students to pick and choose if they wish.

Students not heading back to school for math will be able to brainstorm ideas and fill in sections of the scientific process in order to get their projects off the ground.

Week Two

Monday, July 16

Theme: Prepping to plant
Guiding Question: How do we practice the steps of the scientific process?
Learning Objectives: Students will begin to understand how they are utilizing the scientific process with this project. Other foci on reading, writing, and mathematical skills are especially focused on within this day.

Activities/Lessons/Schedule:

Walk to farm, morning warm-up (8:00 to 8:30)

Work/Chores (8:30 to 9:00)
Phenology Project Monitoring (9:00 to 9:15) Ben Lead
Students will update any changes on the plants they are monitoring, especially utilizing measurement skills at this phase

Reading (9:15 to 9:45) Lisa lead
Utilizing articles about scientific research, students will identify the questions, hypothesis, and methods utilized by the researchers

Questions (9:45 to 10:00) Ben/Lisa Lead
Students will formulate, tweak, and re-write/revise the research questions we have already provided

Break/snack (10:00 to 10:15)

Hypothesis (10:15 to 10:30) Ben lead
Students will formulate hypotheses around their specific research questions

Methods and design (10:30 to 11:00) Small group breakouts w/ instructors

Beginning to write a plan for how students will set up, monitor, and carry out this experiment.

Math (11:00 to 11:35) Emily lead

This would be a good opportunity to do some measurement-based mathematics in preparation for our seed monitoring

Tuesday, July 17

Activities/Lessons/Schedule:

Walk to farm, morning warm-up (8:00 to 8:30)

Work/Chores (8:30 to 9:00) Ben lead
Monitor and take care of research plants as well as pulling out specific students for specific needs

Reading/writing (9:00 to 9:45) Lisa lead - *Seedfolks*

Break/snack (9:45 to 10:00)

Business plans (10:00 to 10:45) Janet lead, small group breakout with instructors

Math (10:45 to 11:35) Emily lead

Associate with business plans – balancing a budget, looking at expenses and incomes?

Wednesday, July 18

Walk to farm, morning warm-up (8:00 to 8:30)

Assist in Harvest (8:30 to 9:00)

We can also pull out specific students for specific needs at this point

Reading/writing (9:00 to 9:45) Lisa

Break/snack (9:45 to 10:00)

Business Plans (10:00 to 10:45) Janet

Math (10:45 to 11:35) Emily

Thursday, July 19

Activities/Lessons/Schedule:

Walk to farm, morning warm-up (silly game/activity) (8:00 to 8:30)

Chores, research project upkeep (8:30 to 9:00)

Phenology Project Monitoring (9:00 to 9:15)
Students will continue to watch and update their plants, especially using measurements

Business Plans (9:15 to 10:00) Janet

Break/snack (10:00 to 10:15)

Reading/writing (10:15 to 11:00) Lisa

Math (11:00 to 11:35) Emily

Weeks Three and Four

Researchers comments: As one can see, the schedule slowly progressed away from the proposed curricula and toward what would become the daily and repetitive schedule that looks much like the last couple days of the second week. The last two weeks of the course followed almost an identical schedule to the last day, as seen above, where about half of the morning was spent on the farm, and the rest spent back in the classroom working on specific skills (or vice versa – classroom then farm). As one can see, the teaching team did not write a unique schedule for the latter half of the program, as daily routine with minimal variation set in.

Appendix D:

TEACHER SURVEY QUESTIONS

PROGRAM RESEARCH STUDY

1. What interested you in this program in the first place?
2. What were your initial thoughts about this program?
3. What program elements did you think would be successful?
4. What curriculum elements did you think would be challenging?
5. How do you feel the students responded to the program?
6. In what ways did you see the students change over the course of the program?
7. In what ways did you or your teaching change over the course of the program?
8. What program elements were successful?
9. What program elements were challenging?
10. Would you do this program again in the future? Why or why not?
11. What program elements would you keep?
12. What program elements would you change?
13. What are your overall thoughts/impressions of the program?
14. Do you have any other comments, questions, or concerns?