THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF AGRICULTURAL ECONOMICS, SOCIOLOGY, AND
EDUCATION

DESCRIBING SECONDARY AGRICULTURAL EDUCATION IN THE CENTRAL
VALLEY CANTON OF TURRIALBA, COSTA RICA: A CASE STUDY

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SPRING 2014

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree in Agricultural and Extension Education
with honors in Agricultural and Extension Education

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ABSTRACT

Education is of major importance in Costa Rica, reflected by over 6% of GDP expenditures. The agricultural industry is of vital significance to the economy of many rural towns of Costa Rica, especially in the fertile Central Valley. Evaluation and discussion of secondary agricultural education in Costa Rica, however, is not extensively recorded. Case studies are developed, using multiple data sources, on populations not commonly analyzed. The purpose of this case study was to compile a general description of secondary agricultural education programs in the Central Valley town of Turrialba, Costa Rica. Data was collected to: describe the scope of the schools; discuss curriculum standards and courses; and assess perceptions of agricultural education by administrators, teachers, and students. Data collection methods included interviewing, observations, physical artifact collection, and photographs. Of the many secondary schools in Turrialba, two offer agricultural education courses. The first is an urban semi-public bilingual school which offers mandatory courses in agriculture for the first three years of education. The second is a technical school in a rural area outside of Turrialba. The emphasis of this school’s technical affiliation is agriculture with foci in: production agriculture, agroecology, and food processing. Agriculture curriculum is sourced from the country’s education ministry for the technical school, but not for the bilingual school. Perceptions of agricultural education are positive, yet enrollment is a concern. This study describes a vibrant region with pride in agriculture but minimal success in promoting agriculture as a potential and successful career field. Research recommendations from the study are to visit and observe other agricultural education programs in the country.
# TABLE OF CONTENTS

ABSTRACT ......................................................................................................................... I

LIST OF FIGURES ............................................................................................................. IV

LIST OF TABLES ............................................................................................................... VI

ACKNOWLEDGEMENTS ................................................................................................. VII

CHAPTER 1 INTRODUCTION ......................................................................................... 1
  Context of Study ................................................................................................................ 1
  Purpose and Objectives .................................................................................................... 3
  Significance ....................................................................................................................... 4
  Operational Definitions .................................................................................................... 5
  Limitations ........................................................................................................................ 7
  Summary ............................................................................................................................ 8

CHAPTER 2 REVIEW OF RELATED LITERATURE ..................................................... 10
  Significance of Vocational and Agricultural Education .................................................. 10
  Case Studies in Education ............................................................................................... 12
  Education in Costa Rica .................................................................................................. 13
  Agriculture in Costa Rica ............................................................................................... 16
  The Central Valley Canton of Turrialba .......................................................................... 17
  Summary ............................................................................................................................ 20

CHAPTER 3 METHODS .................................................................................................. 22
  Purpose and Objectives .................................................................................................... 22
  Conceptual Framework .................................................................................................... 23
  Research Design .............................................................................................................. 24
  Data Collection Methods ............................................................................................... 25
  Population ......................................................................................................................... 28
  Questions .......................................................................................................................... 29
Data Analysis and Interpretation ................................................................. 31
Data Presentation ..................................................................................... 32
Summary ................................................................................................. 32

CHAPTER 4 RESULTS....................................................................................... 34
Purpose and Objectives............................................................................ 34
Objective 1: Describe Secondary Education in Turrialba, Costa Rica .......... 35
Objective 2: Describe Agricultural Education Provided in Secondary Education in Turrialba, Costa Rica ................................................................. 63
Objective 3: Describe the Perceptions of Administrators, Teachers, and Students of Agricultural Education in Turrialba, Costa Rica ...................... 105
Summary ................................................................................................. 117

CHAPTER 5 CONCLUSIONS........................................................................... 119
Purpose and Objectives............................................................................ 120
Objective 1: Describe Secondary Education in Turrialba, Costa Rica .......... 120
Objective 2: Describe Agricultural Education Provided in Secondary Education in Turrialba, Costa Rica ................................................................. 123
Objective 3: Describe the Perceptions of Administrators, Teachers, and Students of Agricultural Education in Turrialba, Costa Rica ...................... 127
Summary and Concluding Thoughts ......................................................... 130

APPENDICES.............................................................................................. 132
Appendix A: Units of Instruction for LEB Students in the Tourism Elective .... 132
Appendix B: Expanded Description of Institutions Attended by Turrialba Agriculture Teachers ................................................................. 135

REFERENCES............................................................................................ 138
LIST OF FIGURES

Figure 2.1. Organization of Public Secondary Education in Costa Rica ...................... 16
Figure 2.2. Map of the canton of Turrialba (Turrialba, 2011) ................................. 18
Figure 3.1. Conceptual Framework of the study ...................................................... 23
Figure 3.2. Data collection methods utilized in the study ........................................... 26
Figure 4.1. Diagram of Table 4.2: Transportation data of secondary school students in Turrialba ................................................................. 41
Figure 4.2. General locations of secondary student homes in Turrialba .................... 42
Figure 4.3. Image of UCR campus sign: entrance to LEB campus ......................... 49
Figure 4.4. Image of LEB secondary school main office ........................................ 49
Figure 4.5. Image of the LEB school campus from roadway ................................. 50
Figure 4.6. Image of academic building and school grounds at LEB ..................... 50
Figure 4.7. Image of student snack bar and grounds at LEB ............................... 51
Figure 4.8. Image of covered walkways on LEB school grounds ............................. 51
Figure 4.9. Image of the main entrance area of CTP school grounds ..................... 59
Figure 4.10. Image of CTP student bus drop-off area ........................................... 59
Figure 4.11. Image of the CTP campus and surrounding area .................................. 60
Figure 4.12. Image of a school-wide CTP assembly, held in the gymnasium .......... 60
Figure 4.13. Image of CTP academic hallways ...................................................... 61
Figure 4.14. Image of a normal CTP classroom ..................................................... 61
Figure 4.15. Image of LEB plant science student workbooks ................................ 68
Figure 4.16. Image of student project book within LEB plant science class .......... 75
Figure 4.17. Image of CTP student projects reflecting the different plant parts .......... 83
Figure 4.18. Image of practical food processing experience for CTP students .......... 83
Figure 4.19. Image of CTP students performing field work .................................. 84
Figure 4.20. Image of CTP students performing animal processing practical ........... 84
Figure 4.21. Image of CTP student processing freshly slaughtered chicken ............. 85
Figure 4.22. Image of CTP agroecology teacher giving a lecture on ruminant systems. . 85
Figure 4.23. Image of LEB agriculture classroom .................................................... 90
Figure 4.24. Image of LEB plant science facilities .................................................... 90
Figure 4.25. Image of CTP food processing laboratory ............................................. 92
Figure 4.26. Image of CTP meat rabbit production facilities .................................... 92
Figure 4.27. Image of dairy goat production facilities at CTP ................................. 95
Figure 4.28. Image of broiler chicken production at CTP ....................................... 95
Figure 4.29. Image of CTP hog production facilities .............................................. 96
Figure 4.30. Image of CTP organic garden with lettuce and cabbage ..................... 96
Figure 4.31. Image of CTP organic garden with peppers ....................................... 97
Figure 4.32. Image of LEB agriculture teacher interacting with students ................. 100
LIST OF TABLES

Table 2.1. Public Education Cycles in Costa Rica................................................................. 14
Table 4.1. Occupations of parents of various secondary students ................................. 39
Table 4.2. Transportation data of secondary school students in Turrialba ...................... 40
Table 4.3. Units of instruction for 1st year students at LEB............................................... 66
Table 4.4. Units of instruction for 2nd year students at LEB .............................................. 67
Table 4.5. Units of instruction for 3rd year students at LEB ............................................... 69
Table 4.6. Technical course schedule for agriculture production students at CTP............ 71
Table 4.7. General content of 1st year LEB agricultural course........................................ 73
Table 4.8. Curriculum outline for 1st unit of 1st year agricultural course at LEB .......... 74
Table 4.9. Sample program of study of CTP animal science curriculum....................... 77
Table 4.10. Detailed curriculum sample of CTP agricultural production specialty area.. 80
Table 4.11. Educational and experiential background of Turrialba agricultural teachers 86
Table 4.12. Agricultural facilities at the large educational farm at CTP ......................... 93
Table A1. Units of instruction for 4th year students at LEB .............................................. 133
Table A2. Units of instruction for 5th year students at LEB .............................................. 134
Table B1. Listing of higher education institutions attended by secondary agricultural
educators in the study ......................................................................................................... 136
ACKNOWLEDGEMENTS

It is with gratitude and joy that I acknowledge several supporters of this honors thesis, most of whom have also played a fundamental role in my academic development.

Firstly, I would like to thank Dr. Daniel Foster, as he has served me in numerous substantial roles during my college career. A primary guide during the development of my thesis, you were always available to answer questions, suggest strategic improvement, and push me to my fullest potential. Dr. Foster, not only do I thank you for serving as my thesis supervisor, but I also must recognize you for the countless outstanding opportunities and advice you have provided by acting as my academic, career, and personal advisor. To be able to work with you over the past several years has been a blessing in so many ways, for I know I can look to you as a the image of a passionate, motivated, and overall superb agricultural educator: you have served as an outstanding professor, professional role model, and individual life mentor who sincerely cares for my whole being. My gratitude can never be fully expressed with words, yet you should know that your impact on my life will resonate throughout my future career experiences and positively influence the lives of countless others.

I have had the pleasure of knowing Dr. John Ewing for several years, dating back to the days of babysitting his children. It is, therefore, a great joy to thank you, Dr. Ewing, for your support of this thesis and of my academic career in general. You are a light of positive influence and an outstanding mentor to so many people, and I am truly thankful for your motivational spirit and academic support over the past several years.
I would like to thank Dr. Melanie Miller-Foster for her research mentoring and cultural support before and during the in-country data collection period. Although we had minimal time to plan and execute this study, I owe so very much credit to you for acting as a guide for my first experience with social science data collection. Your support and tutoring was invaluable, especially considering I had never previously collected data in another language. I know that this study would not have been brought to completion without your positive commentary and research guidance.

In terms of financial support, I must credit this entire thesis to the assistance given through the 2012 Undergraduate International Agriculture Research Competitive Grant for Global Research; the study would not have occurred without this grant. I am honored to have had the chance to work with Dr. Tom Gill, my advisor and professor of International Agriculture, and the Office of International Programs within the College of Agricultural Sciences, as they have provided several monetary provisions and academic opportunities during my time at Penn State. Thank you for your diligent work to provide assistance for and encourage so many students like myself to experience the life-changing opportunities in international travel and study.

Having traveled to Costa Rica three separate times within three years of my undergraduate career, I know I have many “Ticos” to thank for my unforgettable academic and personal experiences in the beautiful country. If not for the warm welcome at both schools in the study, all efforts to explore secondary agricultural education in Turrialba would have been fruitless. I, therefore, would like to recognize and thank the students, teachers, parents, and administrators of both el Liceo Experimental Bilingüe,
Turrialba (LEB) and el Colegio Técnico Profesional Agropecuario, La Suiza (CTP): muchísimas gracias a los dos por dejar una gringa tan extraña entrar e investigar sus centros educativos para desarrollar este proyecto. I also cannot go without thanking my host family and Turrialba friends for serving as vital connections to these schools.

Finally, yet most importantly, I give an enormous amount of gratitude and love to my family for the countless ways in which they have guided and sustained me throughout my life and academic career. Mom: although I pretend that I am tired of hearing people greet me as “Tracy’s daughter,” please know that I swell with pride every time I hear it, for I often find that I have met another person who you have positively impacted. Your dedication to your career is unsurpassable; it is with that passion that you are daily influencing the professionals and youth who surround you. Thank you for inspiring me to enter into the field of agricultural education and consistently encouraging me to reach for greater academic heights. Dad: I truly appreciate your willingness to keep things jovial and comical when mom gets really serious about something. Apart from your humor, I genuinely thank you for your relentless desire to make me the best I can be. I value all of your advice, even when I act like I do not want to hear it. You are my role model when it comes to working hard and doing things well; I can attribute countless academic achievements to your guidance throughout my life. To my sister, Meghan: while I was never able to be at Penn State while you were a student, I nonetheless felt your impact. I am sincerely thankful for the spiritual community and guidance you have given me; it has been invaluable. Mom, Dad, and Meg: I thank the Lord for the blessed family I have been given, for you all have played fundamental roles in my life. I love you.
Chapter 1

Introduction

Education is identified as a vital component of reaching the millennium development goals (MDGs) to significantly decrease poverty and hunger (United Nations, 2010). The official MDG report (2010) stated that agricultural development assists in alleviating food insecurity. Few studies reflect the relationship between agricultural education and an agriculturally-oriented economic region.

The National Council for Agricultural Education developed a *Global Strategy Taskforce* in 2011 to address a strategy for global engagement in secondary agricultural education. Within the goal of developing global competence in secondary education, a target area includes educational case studies as resources (Taskforce, 2012). A rich description of secondary agricultural education programs in a specific region of Costa Rica assists in building globally competent agricultural education students and teachers in the United States by illustrating potential opportunities for study.

Context of Study

Costa Rica has become a country of focus with regards to sustainable development over the past several decades (Herrera Rodriguez, 2008). According to the
World Bank’s World Development Indicators, Costa Rica has been improving over the past 20 years in terms of income, poverty, water access, and education (World Bank, 2013). Agriculture, while the second greatest industry in the country, has been decreasing in terms of workforce and GDP. Today, agriculture comprises only 6.4% of the entire country’s GDP (CIA, 2012). Some areas of the country, however, depend very greatly on agriculture as a source of income.

Costa Rica’s Central Valley, with an optimum climate for diverse crop production, is a vital agricultural region and boasts many smallholder farmers (Central Valley Region of Costa Rica, 2013). In the Turrialba canton of the Central Valley, agriculture comprises 28% of all economic activity, with heavy emphasis on coffee and sugar cane production (Compite, 2006).

Costa Rica values education, reflected in a 94.9% literacy rate and education expenditures reaching 6.3% of the country’s overall GDP, ranking them 32 in relation to all countries’ public expenditures on education (CIA, 2012). Education in the Central Valley of Costa Rica is diverse, especially in terms of secondary schools. Turrialba is both a municipality and a canton. The canton of Turrialba is home to approximately 75,000 people and has 13 secondary schools (Compite, 2006). The structure of secondary schools in Turrialba span from public and semi-public to night and private schools.

Two of the thirteen secondary schools in the canton of Turrialba are known to have agricultural education programs. One is a semi-public bilingual school located just on the edge of the city (municipality) of Turrialba with a strong emphasis on English language learning. The other school that offers agricultural education courses in Turrialba
is located several miles outside of the city of Turrialba in a rural area. The second school is known as a technical school because of the extra year required of students to receive a diploma in a specialty area. The two schools are very distinct yet, together, allow for a picture of agricultural education in the agriculturally-rich area of Turrialba, Costa Rica.

The study was conducted in the summer of 2012. The majority of data collection occurred over a two week period after the completion of a month-long Spanish and agriculture immersion experience that took place in the town of study.

Purpose and Objectives

The purpose of the study is to describe secondary agricultural education programs in the Central Valley canton of Turrialba, Costa Rica. The description of the secondary agricultural education programs focus on general school structure, agricultural curriculum and courses, and perceptions of stakeholders about agricultural education. The following research objectives guided the study:

1. Describe secondary education in Turrialba, Costa Rica
2. Describe agricultural education provided in secondary education in Turrialba, Costa Rica
Significance

The purpose of case studies is to develop an understanding of a unique phenomenon or structure (Robson, 1993): therefore, the significance of the study is to provide a rich description of secondary agricultural education in Costa Rica, further developing competency in global secondary agricultural education. Few studies have been previously conducted in this area. The study assists in constructing a picture of secondary agricultural education around the world through analyzing one area in one country. A taskforce of agricultural education leaders in the United States has identified global competency as a key factor in successful agricultural educators (Taskforce, 2012). A sample description of secondary agricultural education programs from around the world will assist agricultural educators and students in relating to connected aspects of the world. Finally, the study holds significance by displaying the case-based value of agricultural education to a community in an agriculturally-oriented region.

Secondary agricultural education programs around the world have not been a significant source of case studies. A global description or generalization of secondary agricultural education programs would not be feasible. A description of a specific area in Costa Rica, however, will begin to develop a diverse perspective of secondary agricultural education around the world.

Turrialba and its surrounding rural towns are extremely dependent on smallholder agriculture. The local significance of this case, therefore, is to display the situational value of agricultural education in an agriculturally-oriented region of the world.
Operational Definitions

Case studies, due to their unique nature, often contain terminology specific to the area of study. In addition to specific and local terminology, general agricultural education terminology is defined in this section.

Agricultural Education. While no formal definition of agricultural education was found specifically for Costa Rica, a description does exist from the National Council for Agricultural Education (USA); “Agricultural education is a systematic program of instruction available to students desiring to learn about the science, business, and technology of plant and animal production and/or about the environmental and natural resources systems (Council, 2013).”

Liceo Experimental Bilingüe, Turrialba (LEB). Directly translated “Experimental Bilingual High School,” the acronym LEB will refer to the secondary school located within the municipality limits of Turrialba. LEB is characterized by its 5-year semi-public schooling with emphasis on English language learning.

Colegio Técnico Profesional Agropecuario, La Suiza (CTP). Directly translated “Professional Technical Agricultural High School,” the acronym CTP will refer to the secondary technical school located in the county but outside of the municipality of Turrialba (in the municipality of La Suiza). CTP is characterized by its 6-year public schooling that offers a technical degree to graduating students in a specialty area. The specialty area emphasis of CTP academics is agriculture.

Canton. Costa Rica’s political boundaries are first delineated by provinces then, within provinces, by “cantones” or cantons. A canton is politically and socially similar to
a county or local region. The geographical canton of Turrialba includes 12 districts and over 70,000 residents. The study was of the secondary agricultural education in the canton of Turrialba. When referring to the actual city (municipality) of Turrialba (about 29,000 residents), the word “city” is used as a distinction from the entire canton.

**Semi-public School.** A semi-public school, as addressed in the study, is one that is open to any students in the district, but that requires an entrance exam or test to be admitted. LEB, for example, requires an entrance test of general linguistics ability to make sure that the students are able and dedicated to learning English linguistics. This definition varies by school, however, and is only used in the study to emphasize the limitation of space and enrollment at LEB. The school is required to limit enrollment via entrance exams because of the limited space on the University of Costa Rica campus.

**Private School.** A private school, as addressed in the study, is one that is not open to all students in a region. Specific qualifications must be met to enter and tuition is paid by the student rather than the public education system. An example of a private school is the school located on the campus of the graduate university, CATIE, whereas only children of graduate students can enroll. There were no private schools visited or described in the study.

**Public School.** Public education in Costa Rica is free through the secondary years. Public school systems in Costa Rica are not delineated by district but rather open for any student in the general area who desires to attend that school, given they have the transportation to attend. CTP is a public school in the Costa Rica education system.
Limitations

Case studies are descriptions of a given phenomenon using multiple data sources. Data collection reflected the format of a multi-sourced case study but there were some areas of limit within the construction and execution of the project. The primary limitation of the study was the location and time frame of data collection. Prior to the main research time frame of two weeks, some preliminary work was done in country (over a four week period). However, due to the international setting of the study, six weeks was the only available time period to work on the study, restricting a more in-depth and integrated description.

Another significant limitation of the study was the inability to have uniform resources, data, and observations from both schools of focus. The schools are dramatically different in structure and layout, prohibiting physical artifact collection, for example, to be paralleled in both schools. The case study, while of agricultural education in the entire canton, was therefore described without expectation of parallel data sources at both schools.

A limitation of the study was the conflict of information between literature review conducted prior to in-country data collection and in-country interview-based data collection. Literature sources of localized agricultural education in Costa Rica were difficult to come across and did not agree with in-country interviews about schools in the region of study. Discussion of school structure; therefore, reflects a combination of findings from literature reviewed prior to data collection and in-country data collection.
Spanish is the official language of Costa Rica and the primary language of the researcher is English. While the researcher has proficient Spanish-speaking skills, an occasional language barrier would limit more in-depth interviews or data collection in the study. This limitation was minimized, however, by recording interviews in Spanish for later review and verification of interview-based notes.

**Summary**

In describing secondary agricultural education in a localized area of the world, a picture of the relationship between economy and education may be conceptualized. Additionally, a snapshot of agricultural education in a global setting will contribute to the efforts of globalizing agricultural education curriculum in the United States. Costa Rica is a country with rich agricultural and educational roots. Education has been of vital importance to the country, especially since the abolition of its military and redirect of funds towards education programming. Some areas of the country, specifically the Central Valley, are very dependent on agriculture as a source of local income. Few studies have been conducted, however, evaluating agricultural education at the secondary level in a global setting.

The canton of Turrialba, located in the Central Valley, was selected as the area of study in describing secondary agricultural education programs. The purpose of the study is to describe secondary agricultural education in this canton through evaluation of the general secondary education system and examine perceptions of local stakeholders.
(students, teachers, administrators) with regards to agricultural education. The nature of the study follows the multi-data sourced methods of a case study.
Chapter 2

Review of Related Literature

Chapter two will discuss existing literature that reflects background of various components of the study. Review of related literature has revealed that agricultural education has not been strongly evaluated in a global context. Literature does, however, support the following areas of the study: significance of agricultural education, case studies in education, education and agriculture in Costa Rica, and background of the area of study.

Significance of Vocational and Agricultural Education

The emergence of pragmatic thought marked a significant point in educational settings. The work of Charles Sanders Peirce, William James, and John Dewey, built onto the early philosophy of scholars such as Socrates, Plato, and Aristotle to promote the concept of vocational education. The need for vocational education, while rooted in apprenticeship worksite training, has transformed to include a higher level of educational theory and technological understanding (Talbert, Vaughn, Croom, & Lee, 2007). Vocational education developed into a systematic method of instruction that also included a strong emphasis on practical application. A theorem of vocational education,
as identified by Prosser and Allen (1925), is that it provides education applicable to the demands of the given industry of need. Agricultural education, though diverse on a global scale, is regarded as vocational education with regards to structure and purpose. Agriculture education programs must, therefore, adapt to the changing agricultural industry (Phipps, Osborne, Dyer, & Ball, 2008). UNESCO’s “Education for All Global Monitoring Report” (2012b) defines the effectiveness of vocational and technical education as existing within the ability of meeting local labor market needs.

The National Council for Agricultural Education initiated a taskforce in 2010 to develop “A Strategy for Enhancing Global Engagement in Agricultural Education.” The taskforce identified seven global engagement strategy pillars. One of the strategy pillars discusses the significance of increasing global competency in teacher preparation. Teacher preparation addresses the resources that can be made available to teachers for global competency development. Resource examples include courses, lessons, examples, case studies, and activities. Global continuum experiences and partner development are additional pillars that address the importance of increasing student awareness of global agriculture. Engagement is also recommended via video-conferencing or exchange trips to experience the diversity of other agricultural education in the world (The Council, 2012).
Case Studies in Education

Case studies are optimum research methods for developing rich descriptions of social activities or program (Stark & Torrance, 2005). As such, case studies can properly illustrate the complexities of a system such as a secondary school program in another country. Education systems have commonly been a focus of case studies due to the unique nature of individual school systems. Further discussion of case study use and methods is found in chapter three, methods.

Several case studies of pre-college science education were conducted in the 1970s to evaluate the bigger picture of science programs in the United States. These educational case studies ranged in forms of location, evaluation methods, and time spent on location. Emergent themes in the science programs (social science, math, natural sciences) were drawn and discussed in each of the 11 case studies (Illinois, 1978). The purpose of the studies was not to define science education in the U.S. but rather to take snapshots of individual schools around the country and add to the larger schema of science education (Illinois, 1978).

A case study was conducted to understand agricultural education teachers’ needs in agricultural communications for the state of Oklahoma. The study reviewed teacher needs through a semi-structured focus group interview method. The study used quantitative presentation methods to display the qualitative data gathered from the focus group, also discussing findings and quoting specific interactions (Stockamp, 2011).

The reviewed case studies in education reflect different components of educational systems by using assorted data collection methods. The overarching
commonalities between all reviewed studies, however, included the discussion of emerging themes in educational settings.

**Education in Costa Rica**

Education is of primary importance in Costa Rica. The significance of education is reflected in a 94.9% literacy rate (CIA, 2012) and universally free education, even past obligatory years of attendance (UNESCO-IBE, 2010). Costa Rica eliminated its military in 1958 and thus redirected a significant component of their national spending. Redirected funds were targeted at strengthening the country’s education system in addition to building a local public force. Today, 23.1% of all government spending (6.3% of overall GDP) is directed towards education (UNESCO, 2012a). The country’s increases in educational investment are seen in increased enrollment in secondary education. In 1991, 45% of the total secondary school-aged population was enrolled whereas in 2010, that percentage was 100 (UNESCO, 2012a).

Costa Rica maintains its public education system through the Ministry of Public Education, or MEP (Ministerio de Educación Publica). MEP oversees individual teacher contracts, school funding, curriculum standards, special programs, and general school organization (Publica, 2013). MEP only works with public school systems, but Costa Rica is also home to several international (private) schools, such as the one on the campus of CATIE in Turrialba. MEP is housed in the nation’s capital of San Jose but has various offices throughout the countries’ provinces. Each office houses administrators to
coordinate local public education. Also at the national level is the technical education department which oversees the technical sector of secondary education in Costa Rica.

Table 2.1

*Public Education Cycles in Costa Rica*

<table>
<thead>
<tr>
<th>Cycle</th>
<th>One</th>
<th>Two</th>
<th>Three</th>
<th>Four</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education type</td>
<td>Primary: general basic education</td>
<td>Primary: general basic education</td>
<td>Secondary: general basic education</td>
<td>Secondary: diversified education</td>
</tr>
<tr>
<td>Approximate age of students</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Grade/year</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Diploma received*</td>
<td>1*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attendance Required</td>
<td>Obligatory</td>
<td>Obligatory</td>
<td>Obligatory</td>
<td>Not obligatory</td>
</tr>
</tbody>
</table>

*Diploma received signifies the title received at the completion of the primary and secondary level. Students must pass national standardized tests to receive the following diplomas:

1* (upon completion of grade 6) = Primary Education Diploma

2* (upon completion of grade 11) = Bachillerato, required for post-secondary education

3* (upon completion of grade 12 in a technical school) = Technical/specialty diploma

As seen in Table 2.1, public education in Costa Rica is broken into four cycles and mandatory attendance extends to the end of the third cycle. The first two educational cycles in Costa Rica comprise primary education, which includes grades 1-6. The third cycle is part of secondary education and completes with 9th grade. Mandatory testing occurs at the end of the 6th and 9th years and students receive a diploma after each of
these years. Upon entering non-obligatory secondary schooling, students have the option to continue on an “academic” track of 5 years (completing with an additional diploma, called the bachillerato) or a “diversified” track of 6 years (completing with two diplomas—one general and one for their diversified specialty area). Both tracks require a mandatory test in the last year of schooling to earn the respective diplomas (UNESCO-IBE, 2010).

Within the third and fourth cycles of public education, Costa Rican students can diversify their experience through various options. The organization of public secondary education in Costa Rica is seen in Figure 2.1, whereas post-obligatory years can be divided by the option of pursuing two or three years of additional schooling. Within each area (except general public schools) of the fourth cycle “diversified education,” students receive varied courses. Artistic schools allow students to graduate with a certificate specific to their area of arts, in addition to the general bachillerato diploma. Within the option of a technical focus, students will be enrolled in “elective” courses for their third cycle of general basic education to prepare for selection of a specialty area in their fourth cycle of diversified education.
For the first three years of secondary education (7-9), students are required to maintain 42 lectures per week at 40 minutes per lecture. The national requirement of grades 10 and 11 is 44 lectures per week at 40-60 minutes per lecture whereas 60-minute lectures occur no more than 4 times per week (UNESCO-IBE, 2010).

Agriculture in Costa Rica

Costa Rica’s warm and humid climate is optimum for growth of many tropical fruits and plants. The CIA world fact book identifies Costa Rica’s major agricultural products as including: bananas, pineapples, coffee, melons, ornamental plants, sugar, corn, rice, beans, potatoes, beef, poultry, dairy, and timber (CIA, 2012). Despite its small land area, Costa Rica is currently the world’s third greatest producer of pineapple (FAO, 2013). The geographic structure and climatic conditions of Costa Rica has also allowed it
to be the producer of some of the world’s best coffee. While there is not a great quantity of coffee being produced in Costa Rica, the country’s partially shaded mountainsides allow for longer, more complex production of richer-flavored coffee beans (Baker, 2009).

Historically, Costa Rica has been a hub for tropical crop production. In the late 1800s, Costa Rica was targeted as one of the main countries for the “Banana Republic” as controlled by the United Fruit Company. In addition to local economic development, this historical time brought corruption to local farmers by forcing banana cultivation in a previously diverse agricultural and ecological region. During the “Banana Republic,” however, a major railroad was constructed by the head of the United Fruit Company. It extended through Central America, connecting Costa Rican agriculture and products to other countries (The Evolution of Costa Rican Agriculture, 2013). The country’s agricultural industry expanded significantly as a result of banana industry growth. Substantial agricultural exports caused agriculture to act as the country’s predominant source of GDP up until recent development in the tourism industry. Today, agriculture comprises 6.2% of the total country’s GDP while tourism and services comprise 72.7% (CIA, 2012).

**The Central Valley Canton of Turrialba**

Costa Rica is divided into 7 distinct geographic and political regions known as provincias (provinces). Each province is broken into smaller cantons which also contain
districts and municipalities. There are about 28,960 residents in the city of Turrialba, which is located in the province of Cartago (tiptopglobe.com, 2012). However, there are approximately 70,000 residents in the canton of Turrialba, which contains 12 districts and covers about 1,600 km\(^2\) (618 mi\(^2\)) of land (Argüello, 2012). The canton of Turrialba contains around 166 villages (poblados); 95% of which are in rural areas and 5% of which are in urban areas (Turrialba, 2011). Turrialba is not a common tourist destination, making it less vulnerable to global influence and more appropriate for reflecting the Costa Rican culture.

*Figure 2.2. Map of the canton of Turrialba (Turrialba, 2011)*

Note locations where the study was conducted: Turrialba municipality and La Suiza
Employment in the canton of Turrialba reflects a strong emphasis on agriculture. About 47% of the Turrialba workforce is employed in agriculture (plant and animal production) whereas only 14% of the entire Costa Rican workforce is in agriculture. Following agriculture, 16% of the Turrialba workforce is in repairs and commerce and 13% of the workforce is in manufacturing (CIA, 2006; Compite, 2006).

While agriculture claims the highest number of working individuals in Turrialba, overall economic activity is dominated by services (48%), followed by agriculture (28%). Turrialba is home to two predominant factories that export products globally: Rawlings baseballs and Firestone tires. Exported baseballs account for almost 60% of Turrialba exports, followed by 22% of exports in textiles (Compite, 2006).

Agriculture comprises only 6.2% of the entire country’s GDP (CIA, 2012), yet Costa Rica’s Central Valley is a vital agricultural region, as it has a key climate for diverse crop production and boasts many smallholder farmers. Agriculture in the Turrialba canton of the Central Valley has heavy emphasis on coffee and sugar cane production. Macadamia nuts are also of significance to the region, especially in exports, along with dairy products and ornamental plants (Compite, 2006).

The canton of Turrialba is a hub for research in agriculture because of its graduate school, CATIE, which stands for Tropical Agricultural Research and Higher Education Center. The University of Costa Rica (UCR) also has a campus in Turrialba, offering courses in agriculture as well as various other disciplines.
Summary

Literature was not found to reflect the situational example of a case study in global secondary agricultural education, but other information sources support the aspects of the study and grow basic understanding of its foundational concepts. Vocational education has been identified by historical educational leaders as a key area for technical skills development. Agricultural education is identified as an area of vocational education, especially with regards to its need for meeting local economic and labor needs. Case studies have been often conducted in educational settings to better understand localized educational phenomenon. Education in Costa Rica has been an area of consistent emphasis by the country’s government, especially noted in increased spending on public education. Through a complex system of cycles, Costa Rican students can complete primary education then pursue various options within the secondary education model. Secondary education in Costa Rica also allows students to select a specialty area for graduation, increasing their preparedness for post-graduation pursuits. Agriculture in Costa Rica has a rich history and has been a strong part of the country’s past. Agricultural crops produced in Costa Rica are diverse and significant in the global marketplace. Agriculture no longer holds the title of highest GDP in the country, as development has allowed tourism to take the role of bringing in the most national income. Costa Rica is divided into various geographical and political regions. The canton of Turrialba, which lies in the Central Valley, is home to over 70,000 residents and boasts a strong agricultural economy, in addition to services. The review of related literature has supported various components of the study by developing a base understanding of Costa
Rican education, agriculture, and local demographics for the Central Valley canton of Turrialba.
Chapter 3

Methods

This chapter presents the research methods used in this descriptive study. The unique nature of the project called for use of the case study format. Case studies are evaluations of situational programs, phenomenon, or peoples. Data collection for case studies is usually diverse and multi-sourced. This case study involved several evidence sources, including: interviews (informal, unstructured, and semistructured), observations (participant and simple), physical artifact collection (student statistics, curriculum standards) and photographs (of school structures and student work environments).

Purpose and Objectives

The purpose of the study is to describe secondary agricultural education programs in the Central Valley canton of Turrialba, Costa Rica. The following research objectives guided the study:

1. Describe secondary education in Turrialba, Costa Rica
2. Describe agricultural education provided in secondary education in Turrialba, Costa Rica

**Conceptual Framework**

The conceptual framework (Figure 3.1) of the study is organized to reflect the relationship between broader determinants of local school-based agricultural education and perceptions of agricultural education.

*Figure 3.1. Conceptual Framework of the study*


**Research Design**

Several case studies of science education programs exist in the literature, but few address agricultural education. A description of secondary agricultural education in a single Costa Rican canton is unique and should follow the format of a case study (Robson, 1993). Definitions of case studies vary in the literature, but there are several key characteristics that define a successful use of this method. Robson (1993) clearly states, in his definition of a case study, that it must be developed using multiple sources of evidence. Schrank (2006) also emphasizes multiple sources of data and strategies for analysis, especially considering that case studies reflect populations not commonly analyzed. Robson (1993) also specifies situations that are optimum for case studies with one type being “studies of organizations and institutions” that contain many possible foci. A case study is defined by Rossman and Rallis as an “in-depth and detailed exploration of single examples that are ‘an instance drawn from a class’ of similar phenomena. They seek to understand the larger phenomenon through close examination of a specific case and therefore focus on the particular. They are descriptive, holistic, heuristic, inductive. (2012, p. 101)”

The study follows the concept of a case study in its broad sense. The development of research methods follows the concept of emergent methodology. The setting and short time frame of preparation for the study prevented planning of elaborate methods and data collection. With such restrictions, methods and data collection procedures were evaluated and altered during the two week course of the study to best fit the needs of properly describing the subject at hand. Decisions were made during the time in country given the
availability of school access, teacher availability, and responses within the data. The process of research design for the study was guided, nonetheless, by an appropriate decision-making process of relevant questions, data, and analysis (Philliber & Schwab, 1980).

The process of gathering data from the schools involved the following: finding a contact individual for each school, set up initial visit to school administration, gain permission to work in the school and collect data by receiving a signed letter of consent for IRB protocol (research was deemed exempt under the ID# 40154), visit agricultural teachers and classes, interview teachers and students of agriculture if the time was available. School contacts were mostly found through personal and professional relationships. The contact for LEB was the researcher’s host family sister, a first year student at the school who shared that she was in an agriculture class. The contact for CTP was a friend of another host family (to another PSU student on the immersion trip) who is a student counselor at the technical professional high school. Once these contacts were identified, plans were constructed to gain permission from and begin working in the two schools.

**Data Collection Methods**

The study is intended to reflect the case study format, thus many sources of data collection and analysis were utilized. Yin (2009) identifies this as the first principle of data collection for case studies. Using multiple sources of data to validate a fact or
phenomenon is known as data triangulation (p. 99). Triangulation not only increases construct validity but is also shown to increase the overall quality of case studies over studies with only one source of data (Yin, 2009).

In order to maintain triangulation, four principal data collection methods were used in the study (see also Figure 3.2):

1. **Interviews** – Informal, unstructured, and semistructured
2. **Observations** – Participant and simple
3. **Collection of Physical Artifacts** – Student statistics, curriculum standards
4. **Photographs** – Of school structures and student work environments

**Figure 3.2** Data collection methods utilized in the study

Interviewing is a common method for case studies (Robson, 1993) and can be divided into several types. Informal interviewing is a method of gathering information in common setting whereas the researcher remembers conversations that occurred throughout the time in the field (Bernard, 2013). This method is not clearly defined as interviewing since the subjects are not fully aware of information being gathered. Open-ended interviewing, also referred to as unstructured interviewing (Bernard, 2013), is designed to have a simple format with little control on behalf of the researcher. The basic
goal of open-ended or unstructured interviewing is to gain insights about an individual’s perceptions on a matter (Bernard, 2013; Robson, 1993; Yin, 2009). Semistructured interviews, also referred to as focused interviews (Robson, 1993; Yin, 2009), are more in-depth and organized than unstructured or informal interviews but still have some flexibility (Bernard, 2013). According to Bernard (2013), a semistructured interview usually involves an interview guide: a list of topics and questions that should be covered during the time of interview. Bernard also advises recording all interviews, if possible, to maintain accuracy. All semistructured interviews were documented with a voice recorder in addition to the researcher’s written notes.

Observations are considered by Yin (2009) to be one of the six major sources of evidence for case studies. Many forms of field observation exist, but the two primarily used for the study were participant and simple (or direct). Bernard discusses various types of participant observation, whereas the researcher is required to be immersed in the environment of the data set to collect data. The three main types of participant observation are: complete participant, participant observer, and complete observer (Bernard, 2013). Due to the time restrictions of the study, complete participant immersion was infeasible. However, the researcher did participate in some observed events in addition to completely observing events (without participation). Robson (1993) identifies complete observation as simple observation whereas the researcher conducts observation passively and unobtrusively. Bernard notes, however, that this form of direct observation can result in reactive, imprecise actions if the subjects of observation know that they are being observed (2013). Yin (2009) discusses direct observation as optimum with the
presence of other observers. The reliability of this case study would increase if another observer was present, but restrictions in the study prohibited triangulation of human observers.

Physical artifacts are also considered a major source of evidence in case studies (Yin, 2009). Physical artifacts are defined as a piece of physical evidence used to better understand the situation or setting of study. Physical artifacts from CTP vary from curriculum standards to student statistics and teacher schedules. Physical artifacts from LEB are not as extensive as at CTP, but include sample workbooks from the agricultural courses taught at the school.

Photography is mentioned by Yin (2009) as being a source of data for case studies. The study is in a description format, thus benefits from photographs as a visual source of data. Photographs, when of human subjects, can be difficult to analyze in socially mediated populations due to representation theory (Pearson & Warburton, 2005). The photos of the study are used, however, to assist in describing and emphasize descriptions of physical structures in the studied schools.

**Population**

The population of the case study included any persons involved in the two identified secondary schools of Turrialba, Costa Rica. All members of the sampling population were Spanish-speaking and connected to the agricultural programs offered at
both LEB and CTP. The ages of the population vary from youth to middle or late-aged adults. The sub-populations of individuals involved in the study are as follows:

**Administrators.** The researcher was able to collect data from the principal/director of both schools in addition to a local administrator of the national Ministry of Public Education (MEP). Interviews were the primary source of data collection with administrators. All interviews with administrators were recorded.

**Teachers.** The researcher was able to meet with the majority of the agricultural educators at the schools in study. Several interviews were conducted with the one agricultural teacher at LEB, in addition to observations of her classroom. Of the twelve agricultural science teachers at CTP, the researcher was able to meet with and interview ten teachers. Classroom observation varied among the CTP teachers.

**Students.** The researcher worked with and/or observed an estimated 200 students, between both schools, in the study. The ages of the students, both at LEB and CTP, ranged from approximately 12 (grade 7) to 18 (grade 12). Students were engaged in the study through informal interviewing, focus group-type interviewing and observations (both participant and direct).

**Questions**

Interviews were conducted both formally and informally with all members of the sample population. Numerous questions were asked in interviewing to collect
information for the three objectives of the study, but there were several general questions that were asked of almost all members of the sample population.

**All individuals were asked the following when possible:**

1. How do you define agricultural education?
2. Why do you think agricultural education is important?
3. What do others think about agricultural education?
4. How important is agriculture in Costa Rica?

The following were asked of administrators:

1. What is your educational background?
2. How important is this (agricultural) program to the school?
3. How will your students be successful?
4. How long have you been in this position? What did you do previously?

**The following were asked of teachers:**

1. What is your educational background?
2. How important is this (agricultural) program to the school?
3. How will your students be successful?
4. What are the biggest challenges in teaching?
5. What is your background with agriculture? In teaching agriculture?
6. How long have you been teaching? What did you do previously?
7. What do you like about teaching? Dislike?
8. What is the most important thing you want these students to graduate with?
9. What kinds of resources/budget do you have in the classroom?
10. What do you expect from your students in the classroom?

**The following were asked of students:**

1. How do you define agriculture?
2. How do you think other people define agriculture?
3. Why do you like agriculture? Why not?
4. Why did you choose to take agricultural classes?
5. What do you like/dislike about your agricultural classes?
6. What are your favorite topics/classes (in agriculture)?
7. How easy/hard is it to get a good grade in your agriculture classes?
8. What do you want to do after high school?
9. (If they want to go to college) What would you like to focus on (major) in college and what university do you want to attend?
10. What kind of career do you want to pursue?
11. What do you do in your free time?
12. How much time do you spend on homework?
13. What do your parents do?
14. How far do you live from here and where do you live (rural, urban, suburban)?

**Data Analysis and Interpretation**

Data were collected for the study using various methods. The data were analyzed using a case description reflective of the objectives of the study. A case description is
described by Yin (2009) as a strategy that involves developing a descriptive framework for organizing the case study. A description of the data in a form reflective of the study objectives allows for a more complete picture of secondary agricultural education in Turrialba. Within the study objectives, emergent themes in data were identified and expanded upon in order to interpret the overall picture of agricultural education in Turrialba.

**Data Presentation**

Data is presented with regards to emerging themes from above questions and organized according to the study objective to which it most applies. Yin (2009) describes this method of organization as more clearly defined for better distinction of different case study components. Within thematically organized data of objective three, teacher, student, and administrator data and responses are distinguished to give a better picture of different perceptions of parties involved.

**Summary**

In summary, the study follows the format of a case study due to its unique state. Case studies require multiple methods of data collection, thus, several were used in the study. Methods of data collection included: interviews (informal, unstructured, and semistructured), observations (participant and simple), physical artifact collection
(student statistics, curriculum standards) and photographs (of school structures and student work environments). Methods were used emergently in the study due to time and planning restrictions. Data were organized and interpreted using thematically organized case description methods that reflect the objectives of the study.
Chapter 4

Results

Case studies use multiple sources of evidence to compile a description or analysis of a particular phenomenon (Robson, 1993). The secondary agricultural education in Turrialba, Costa Rica was evaluated using various qualitative case study methods over a two week time period. Two schools in the canton of Turrialba were identified as hosting agricultural education programs and courses. Data were collected and organized with regards to the objectives of the study. Within the study’s objectives, specifically in objective three, data was also organized into emerging themes. The following chapter will present qualitative descriptive data in order to compile a general understanding of secondary agricultural education in Turrialba, Costa Rica.

Purpose and Objectives

The purpose of the study is to describe secondary agricultural education programs in the Central Valley canton of Turrialba, Costa Rica. The following research objectives guided the study:

1. Describe secondary education in Turrialba, Costa Rica


**Objective 1: Describe Secondary Education in Turrialba, Costa Rica**

Objective one addresses the general picture of secondary education in the canton of Turrialba, Costa Rica. Within the picture of general education, the following items are addressed: types of secondary schools, general characteristics of secondary schools, general student backgrounds and interests, general educational atmosphere of the schools visited, and specific details of the two visited secondary schools (LEB and CTP).

Costa Rica has historically placed a strong emphasis on their public education systems, especially since eliminating their military 65 years ago. The Ministry of Public Education (MEP) is the ruling body in public education systems and oversees several local and national factors of the school system. The public education system in Costa Rica is diverse and offers several options to students (see Figure 2.1). Data were collected to further expand the understanding of secondary education, specifically in the canton of Turrialba.

**Secondary school types.** An interview with a local educational assessor for MEP revealed the following types of secondary schools in Turrialba and examples of each:
Public schools. The major public high school in the city of Turrialba is Clodomiro Picado Twight (also known as I.E.T.) and has 1400 students (between 5 years)

Private schools. The InterAmerican private school is located on the CATIE (graduate agricultural university) campus for children of graduate students and professors


Experimental bilingual high schools. LEB (one school of focus in the study) is a bilingual high school and a semi-public school due to its entrance exam requirements and space limitations

Night (public) schools. There are two types of night schools in Turrialba: night schools for returning adults who work and night schools for school-aged youth

Technical professional high schools. CTP (one school of focus in the study) is the only technical professional school in the canton of Turrialba

General secondary school characteristics. The annual school year schedule for public education in Costa Rica includes 200 school days. The school schedule follows the calendar year in that students move to the next grade level at the start of the calendar year. The school year is split into three time frames or “trimesters.” The first trimester runs from February to May. The second runs from June to August, with no vacation between the first and second. The third trimester begins in September after a 20 day
vacation and runs into the start of December, thus allowing for approximately 2 months of vacation before the start of the new school year.

The Ministry of Public Education in Costa Rica maintains a consistent grading system for the different levels of secondary education. For all elective courses (tallers) of years 7, 8, and 9, the percentage weight of grades is as follows:

- 50% = Daily class work (includes practical field experience)
- 10% = Homework (“extra-class” work), includes 2 projects, 5% each
- 30% = Tests, 2 at 15% each
- 5% = General attitude, respect for materials/teachers/others
- 5% = Attendance

For grading in technical classes of grades 10, 11, and 12 (of all technical fields), the percentage weight of grades is as follows:

- 25% = Daily class work (includes practical field experience)
- 10% = Homework (“extra-class” work), includes 2 projects, 5% each
- 40% = Tests, 2 at 20% each
- 15% = One larger, more significant project (i.e. a business plan)
- 5% = General attitude, respect for materials/teachers/others
- 5% = Attendance

**General student backgrounds and interests.** A general picture of student backgrounds and interests was collected via questions in focus groups and interviews. The following were the used questions and subsequent general responses from secondary
What do you do in your free time?

- Soccer (very common)
- Baseball
- Bicycle
- Walking
- Computer/technology
- Facebook
- Skateboard
- Music
- Video games (2)
- Sing
- Hang out with friends
- Church
- Visit family
- Dance
- I don’t often have free time due to long school day

What do your parents do (occupation)? Table 4.1 lists responses of 22 randomly surveyed secondary students of Turrialba schools when asked “what do your parents do/where do they work?”
Table 4.1

*Occupations of parents of various secondary students from Turrialba schools*

<table>
<thead>
<tr>
<th>Mom</th>
<th>Dad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home maker</td>
<td>Glass company employee, owns a beef farm</td>
</tr>
<tr>
<td>Home maker and studying to teach English</td>
<td>Contractor, without a license</td>
</tr>
<tr>
<td>Home maker</td>
<td>Social studies teacher</td>
</tr>
<tr>
<td>Park ranger for a national park</td>
<td>Park ranger for a national park</td>
</tr>
<tr>
<td>Works in the hospital pharmacy</td>
<td>Electricity technician</td>
</tr>
<tr>
<td>Assistant in microbiology lab</td>
<td>Industrial engineer, maintenance</td>
</tr>
<tr>
<td>Home maker</td>
<td>No father at home</td>
</tr>
<tr>
<td>Home maker</td>
<td>ICE (federal electric company) head engineer</td>
</tr>
<tr>
<td>ICE (federal electric company) office work</td>
<td>CATIE (graduate ag university) office work</td>
</tr>
<tr>
<td>Rawlings ball factory, sewing balls</td>
<td>No father at home</td>
</tr>
<tr>
<td>Pen factory employee</td>
<td>Pizza shop employee</td>
</tr>
<tr>
<td>Home maker</td>
<td>Rawlings ball factory employee</td>
</tr>
<tr>
<td>Home maker</td>
<td>Chauffer (driver)</td>
</tr>
<tr>
<td>Cheese processing at local farm</td>
<td>No father at home</td>
</tr>
<tr>
<td>Home maker</td>
<td>Farm administration</td>
</tr>
<tr>
<td>Home maker</td>
<td>Architect</td>
</tr>
<tr>
<td>Farm market vendor</td>
<td>Farm market vendor</td>
</tr>
<tr>
<td>Home maker</td>
<td>ICE (federal electric company) employee</td>
</tr>
<tr>
<td>Home maker</td>
<td>ICE (federal electric company) employee</td>
</tr>
<tr>
<td>Clothing textiles factory employee</td>
<td>ICE (federal electric company) employee</td>
</tr>
<tr>
<td>Home maker</td>
<td>No father at home</td>
</tr>
<tr>
<td>Inspector of textile production</td>
<td>Master of arts for the government</td>
</tr>
</tbody>
</table>
**How far do you live from here and what type of transportation do you use?**

Table 4.2 outlines the responses of the aforementioned question, in order to visualize the diversity of student transit. Figure 4.1 is a graphical representation of Table 4.2.

Table 4.2  
*Transportation data of secondary school students in Turrialba*

<table>
<thead>
<tr>
<th>Transportation type</th>
<th>Approximate time of travel (one way)</th>
<th>Number of students (n&lt;sub&gt;total&lt;/sub&gt; = 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>5 minutes</td>
<td>1</td>
</tr>
<tr>
<td>Walking</td>
<td>10 minutes</td>
<td>2</td>
</tr>
<tr>
<td>Walking</td>
<td>15 minutes</td>
<td>1</td>
</tr>
<tr>
<td>Walking</td>
<td>20 minutes</td>
<td>1</td>
</tr>
<tr>
<td>Walking + Bus</td>
<td>1.5 hours</td>
<td>1</td>
</tr>
<tr>
<td>Bus</td>
<td>10 minutes</td>
<td>1</td>
</tr>
<tr>
<td>Bus</td>
<td>15-20 minutes</td>
<td>10</td>
</tr>
<tr>
<td>Bus</td>
<td>30 minutes</td>
<td>10</td>
</tr>
<tr>
<td>Bus</td>
<td>40-45 minutes</td>
<td>4</td>
</tr>
<tr>
<td>Bus</td>
<td>1 hour</td>
<td>5</td>
</tr>
<tr>
<td>Bus</td>
<td>1.5 hours</td>
<td>1</td>
</tr>
<tr>
<td>Car</td>
<td>10 minutes</td>
<td>1</td>
</tr>
<tr>
<td>Car</td>
<td>20 minutes</td>
<td>1</td>
</tr>
<tr>
<td>Car</td>
<td>30 minutes</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 4.1. Diagram of Table 4.2: Common transportation types and durations of secondary school students in Turrialba

What is the area like where you live (rural, urban, suburban)? The following numbers are associated with the responses of students when asked where they live. See Figure 4.2 for graphical depiction.

- Country/rural area, non-farm = 7
- Country/rural area, farm = 8
- Town/urban area = 6
General educational atmosphere. Of all secondary schools in the canton of Turrialba, only two were extensively observed and visited (LEB and CTP). However, from short visits to and observations of other schools in the area, the following description of the general educational atmosphere was compiled.

The structural layout of secondary schools is that there are several buildings, connected via covered walkways. At first glance, school buildings did not appear to be extremely well maintained but they did meet the basic practical needs of the education system. Classrooms open to the outdoors (rather than enclosed hallways) thus have Master Locks or other locks to maintain security. Classrooms are not designed for teacher comfort but rather for large classes, thus there is minimal space in classroom for personal teacher areas.

Students vary in terms of attentiveness and socialization. Students can be very active in class or very timid. Teachers too vary in terms of attentiveness, classroom comfort, and teaching methods. Students usually address their teachers as “profe” which
is short for profesor or profesora (masculine and feminine Spanish words for “teacher,” respectively). Seldom did students address their teachers as mister or misses and seldom did they use teachers’ last names. There is generally a relaxed atmosphere with regards to schedules. Teachers and students are often late to class with little or no consequence. One example of this was the one and a half hour delay of one agriculture teacher to her class, then the early dismissal of this class, which only meets once a week for 2.5 hours. There are also several days off of school for national holidays or other reasons.

Students at all public schools are required to wear uniforms which can be purchased at local uniform stores. Uniforms include a colored polo shirt with the school emblem and colored pants or skirt. School colors are reflected in the uniforms and final year students (seniors) often wear a different color polo shirt. Extracurricular activities include music, theatre, and sports, but vary by school and do not extend past these general areas. Because the school day is so long, students seldom have homework to do. One to three hours per week is a general estimate of time spent on work outside of class.

**Experimental Bilingual (LEB) high school.** The Liceo Experimental Bilingüe (LEB) of Turrialba, or experimental bilingual high school, was one of the two schools of the study, thus produced much general information about secondary education in Turrialba. The interview with the MEP assessor brought forth the identified purpose of LEB schools. According to the source:

LEB schools are established to meet a certain need. The country has a need for more business/commerce in special services such as hotels, technical fields, social
security, etc... and for this, other languages are needed. Thus, LEBT is an English bilingual school.

A secondary data source provided the official mission and vision statements for LEB. The school’s mission is to, “Provide quality education that promotes the overall development of the students, enriched with English proficiency to achieve the formation of an individual with competitiveness with the social sensitivity needed to successfully face the demands of the new millennium.” The school’s vision, translated from an email received from the principal, is to:

Provide a bilingual alternative in public high schools with academic excellence, which constitutes an enhanced element of democracy, in that all students from different social sectors can access this community outreach service. In addition to academic training, LEB provides a moral and spiritual education with emphasis on the values that are the foundation of the education plan for students.

LEB was founded in 1999 by administration of the University of Costa Rica, thus the location of the school was on the campus of UCR in Turrialba. According to the principal of LEB:

Some people of the University of Costa Rica thought that Turrialba needed another high school because there were many youth and there were only 2 high schools at that time... So they began to organize and transact with MEP, and MEP accepted to have a program here. (MEP) approved a modality that was called “Liceo experimental bilingüe (experimental bilingual high school).”
LEB is a semi-public school due to its testing requirements. However, several other experimental bilingual schools are not public. With regards to LEB in relation to other schools, the principal stated the following:

There are only 17 of these high schools in the country but this is different because it is public. Most of the other bilingual high schools are private or semi-private. So, the only difference between this and the public high schools is that the students here, to get in, have to take a test to measure their linguistic ability. Because the school is bilingual, there is a heavy academic load in English. So the students must take a test to enter.

LEB is located on the UCR campus thus has space restrictions for student body growth. While LEB is a semi-public school, it caps admittance at 50 students per year and divides them into two groups (of 25 students each) for classes. The students have “passing” grade requirements of 70% (overall) per year, as compared to 60-65% for other public schools. The vice principal of LEB explains the academic level:

(The workload is) very academically challenging – (the students have a) heavy workload. In this school the students must have an overall 70% to move to the next year but in other schools its 65% so it is a little more difficult here. This level of academic rigor causes some students to be held back each year, causing variation in the total of 50 students per year. There are 270 students at the school in total, spanning the five grades of 7 through 11.

Funding for school maintenance comes from MEP and totals around $8,000 per year. In addition to the annual maintenance funding from MEP, a “parent association”
provides a donation of $6 per month per student for basic needs. This funding, however, does not include teacher, administration and staff salaries. Education employees in Costa Rica maintain independent contracts with MEP and thus receive income directly from the government. Salaries are determined on individual cases. An average salary, estimated by the vice principal of LEB, of a teacher with 10 years of experience is about $2,000 per month before taxes.

School schedules at LEB run from 7:00 AM to 4:30 PM, Monday through Friday. There are ten 40-minute periods each day, but academic classes are usually doubled up for a block of 80 minutes. Students are in their elective classes (including agriculture) all morning, or four periods, only one day a week. Students remain in the same academic classroom all day and their teachers come to them for the lesson.

LEB is not a specialty school and therefore students graduate with a general diploma. In addition to general academic courses of math, Spanish, sciences, and English, students take two mandatory “workshop” courses: agriculture and artistic exploration (drawing, ceramics, graphics). In their final two years, students can receive courses in an elective area. The four elective courses from which to pick are: computer science, accounting, technical drawing, and tourism (see Appendix A for detailed course of study for the tourism option, taught by agriculture teacher). There is a 20-student cap, however, for these courses, so students may not receive their first choice.

LEB is of a higher academic level than other public schools in Turrialba, but is still open to whatever students desire to apply and take the entrance linguistics exam.
Student responses to the question “why did you choose this school” include the following, with the first being the most common response:

- Because it’s bilingual/to learn more languages/to learn English
- Because it’s one of the best schools in Turrialba
- (It provides) future opportunities
- They teach more and I get to learn more

Students leave LEB, according to the principal, with a distinguished level of English proficiency. Therefore, post-graduate opportunities and interests are diverse. All interviewed students desire to attend a University after high school. Intended areas of study (majors) range from engineering, medicine, architecture, and theatre to law, music, pathology and computer technology.

The background of the administrators at LEB is diverse. The principal received her undergraduate degree in English Education and her Master’s degree in Education Administration from the University of Costa Rica (UCR). She received a teaching certification (called “docencia”) from the public “distance” university of Costa Rica (UNED) and a diploma for teaching primary education. At the time of study, while serving as a principal, she was working at obtaining another Master’s in Legal Management for Education from UCR. The vice (assistant) principal of the school has a degree in math education and taught at the (largest) local public high school for 15 years. He then received a master’s in education administration from the public distance university (UNED) in order to hold his position as assistant principal at LEB.
LEB is located on the campus of the University of Costa Rica (Atlantic headquarters) which is at the edge of city of Turrialba. The campus entrance is along the main roadway in the city and across the street from the city’s large Justice Tribune building. The main office for the high school is directly off to the left once inside the campus gates (see images: Figures 4.3, 4.4, 4.5). These gates are the only entrance onto the campus and to the high school, both by car and on foot. The high school buildings are in one corner of the campus and are separated by sidewalks and grassy areas (see images: Figures 4.6, 4.7). The main office of the school is very small and can only hold a few staff or administrators. Also within the high school grounds are some buildings and playground areas for pre-school and primary school students, as the campus also hosts public primary education for the canton.

The majority of LEB classrooms are divided between three long buildings that sit parallel with each other, two classrooms wide. The hallways are either open sidewalk or covered sidewalk (see image: Figure 4.8). Most classrooms have openings along the top of one wall, allowing for ventilation. Classrooms are all furnished with simple wooden desks and chairs. Bathrooms are simple, undecorated, and did not have paper towels.

The general sounds of LEB included: students talking, joking, and shouting to each other between buildings; cars and trucks passing on the main road; a loud siren to note class changes; squawks of green parrots and other birds flying in the trees; weed whacker, lawn mower, and leaf blowers; and UCR security officers on motorcycles.
The researcher is standing beside the campus sign for the University of Costa Rica (Atlantic campus): LEB is located on the campus and shares an entrance with UCR.

The main office for LEB is located behind the entrance sign and gates to the UCR campus. The small office is a convening place for teachers and administrators.
Figure 4.5. Image of the LEB school campus from roadway

LEB is located just off the main roadway that runs through Turrialba. The high school campus, located within the UCR campus, is enclosed in a gated fence.

Figure 4.6. Image of academic building and school grounds at LEB

The buildings of the LEB high school are separated by grassy areas. The image shows one of the main academic buildings of the LEB school.
Figure 4.7. Image of student snack bar and grounds at LEB

The “soda” or snack bar of the LEB campus is separate from the academic buildings and often is an area for students to congregate during break times.

Figure 4.8. Image of covered walkways on LEB school grounds

The walkways that separate buildings at LEB are either open (see Figure 4.6) or covered with metal roofing.
LEB students have several options for lunch. They may bring their lunch to school or they can leave campus to go home for lunch – there is no cafeteria at LEB. There is, however, a small snack bar that offers breakfast foods and snacks to students and teachers (see image: Figure 4.7).

General issues at LEB were portrayed in discussion, interviewing, and observation. The greatest issue that restricts the school and its growth are the physical restrictions of being located on the UCR campus. This issue limits student body growth and renovation of existing structures. The issue was planned to be resolved within the next several years, however, as LEB was planning to re-build in another location with more land and area to grow. According to the vice principal, plans for this location have been in place for “like 6 or 7 years. We hope that it opens within another year. We need to get permits and we need to get money. (The) money is coming from MEP.” Another major issue at the school is funding for growth. While funds for the new school will come from MEP, the ministry does not provide excessive funds for overall development of programs and facilities. The granting process is very long both at the school and national level to request and receive additional funds.

**Professional Technical (CTP) high school.** CTP was one of the two schools of the study, thus much general information about secondary education was gathered at the school. The MEP assessor identified CTP schools as having specific focuses depending on the needs of the region. According to this source, CTP’s are mostly targeted at preparing students for work. Specifically for Turrialba, the MEP employee stated, “For example, our CTP is agriculturally-focused because this region has lots of small farms, so
the country wanted to strengthen and support the small-holder farmers by preparing the students for going back to the farm.”

CTP was established in 1972, thus celebrated its 40th anniversary in 2012. According to the school’s vice principal, the school was started just like the other technical schools – according to the local needs of the people. In the 1970s, the local need for all technical schools was agriculture, so most of the older professional technical schools of Costa Rica have farms, even if they do not use them currently.

While the official technical area for CTP is in agriculture, other specialty areas are offered to students. The specialty areas offered to CTP students (reflected on a technical diploma) are: computer networking, executive secretary (management), food processing (agroindustry), agroecology, and general production agriculture. At the time of study, CTP was planning to expand its specialty program offerings within the next year, however, to include: tourism, accounting, and occupational health.

CTP had about 980 students between all 6 years of courses. Due to retention issues, the amount of students in each year decreases as the grade increases. There were approximately 240 students in the first year at CTP but only 60 in the sixth year. Reasons for dropout students include: desiring to finish high school sooner (at a 5-year academic school), costs for transportation, relationship status, pregnancy, or desiring to work.

Funds for CTP are all sourced from MEP. This includes funds for administration, management, meals, and other needs. A law, known as “law 7372,” was passed specifically to fund technical schools because of the extra programs and physical requirements of those programs.
A weekly schedule at CTP runs from Monday to Friday with classes running from 7 AM to 4:30 PM. Teachers must arrive and sign in to the office before 7 and students arrive concurrently via public transportation or private buses for the school (see image: Figure 4.10, p. 59). The average school day includes twelve “periods” at 40 minutes each. Student schedules vary from single to double period blocks for academic classes. All technical classes last a half day, or 4 hours, due to the practical experience requirements. Students and teachers have two 30-minute breaks, one at 9:00 AM and one at 2:00 PM. Lunch is served in the cafeteria, for those who receive it, between 11:20 and 12:10.

Students are at CTP for 6 years in order to earn both their general diploma (título bachillerato medio) and their specialty technical diploma (título técnico medio). Within the 6 years at CTP, the first three years are “exploratory” years. Students select one “elective” per year, sometimes not receiving their first choice. This “elective” carries two different courses, allowing for the student to have experienced 6 course areas by the end of their third year. At this point, the students “compete” for their most desired specialty area and pick their top choices. According to the principal of CTP, the students are then placed in these specialty areas based on the following criteria: grades, conduct, and prerequisites from previous years (such as passing classes, etc.).

From their 4th year to their 6th year, students are in their given specialty area, taking technical classes for approximately half of all school time. In their 5th year, the students have a one week mini-internship (pasantía) somewhere that applies to their specialty area. Also within their 5th year, students must complete 35 hours of community service. An example of this community service is that four students constructed a small
organic garden for a local primary school and taught the students how to work with the soil and grow plants. For their 6th year at CTP, students finish all classes in August, have the month of September to study, then must take their graduation exams in October. They first take their general graduation exam then they take the exam for their given specialty area (70% required to pass exams). After the exams, given they pass, students must complete a 2-month internship (pasantía) in order to graduate from CTP in December.

There are many reasons why students attend CTP. It is completely public, so any students can decide to attend given they have the means for transportation if they are outside of the schools’ bus range or walking range. According to the principal, “some students come to this school because it’s local and some come because it’s a professional technical school.” A mother of a CTP student, also a teacher at the school, stated that she liked best “the technical degree they get after 6 years.” When asked why they selected CTP over other public schools, student responses are listed below:

- Because of the technical degree (most common response)
- Because its close (very common response)
- I think it is because this school prepares us a little more for a technical career
- Another thing is that we have the possibility of leaving and working – It’s different than other high schools because of the technical degree
- Because there is transportation
- My brothers/sisters went here – one is now at a private university
- It’s easier to find a job when I graduate from here
- I like the teachers
• I wanted to work in this field (agriculture) and this is the only technical school in the region
• My family wanted me to
• (The school has a good) academic record

When asked what they desire to do in the future, responses varied among students. While some did not reveal interest in applying to college, others did, and majors of interest are listed below:

• Architecture
• Criminology
• English
• Architectural engineer
• Medicine
• Graphic design
• Nutrition
• Agronomic Engineering

Administrator backgrounds at CTP reflect the specialty of the high school; that is to say the principal and vice principal have agricultural degrees. The principal received her degree in agronomy, with an agroecology focus, from UCR. With a certification from the Costa Rica National Technical Institute, she taught high school agriculture for 12 years then served as a principal for 6 years elsewhere before coming to CTP. She was still in her first year at CTP at the time of the study. The vice principal has a general agronomy degree from UCR and a teaching degree from the public distance education
school in Costa Rica (UNED). He also received a (baccalaureate) degree in education administration in addition to a master’s degree from a private university. After receiving all of these degrees, he worked for 14 years as an instructor at the national training institute that is responsible for giving technical job support to Costa Ricans. Then he was an agriculture teacher at another technical school for 5 years before coming to CTP.

CTP has, according to the principal, 67 teachers that cover all areas (academic and technical) and about 20 staff and administrative employees. Teachers must provide any resources they desire to use for their classes out of their own salary. Many teachers apply for “grants” to help fund classroom and project supplies. Teacher evaluation does not occur within the school but teachers must become re-certified every 3-4 years by MEP. According to the vice principal, this is important for the school in order that the teachers are constantly up to date with curriculum.

CTP is located at the edge of the rural town of La Suiza, a town in the canton of Turrialba. La Suiza is approximately 6.5 miles from the UCR campus, which is on the outskirts of the city of Turrialba. CTP sits in a very rural area among the mountains and, between 3 locations, has approximately 27 hectares (67 acres) of land.

The view from the CTP campus is of the rolling mountains where the school sits (see image: Figure 4.11). Houses are also visible are, but most of the scenery is of forests and fields. The entrance is against the main road that runs out of Turrialba (route 232). The road has a decent amount of traffic and there is a bus stop out front of the school.

When entering the main school area, where all academic buildings are located, one must pass through a security station and gate located along a main roadway. The
lowest level of the high school area is here at the entrance and the main office is located soon after the security area within school limits. The lowest level of the school area also has the library, gymnasium, computer labs, cooking labs, and snack bar/cafe (see images: Figures 4.9, 4.10, 4.11, 4.12). The main walkway of the school is a covered sidewalk that moves up (from the lowest level and office) an additional three levels via steps. Smaller walkways branch off from this main walkway at each level and correspond to the following areas: the second level has a building for agricultural classrooms and another building for general classrooms; the third level has two buildings of general classrooms and, off to the far side, the cafeteria; the fourth level has another two buildings of general classrooms in addition to an area for the counselor’s office.

CTP classrooms are divided, as described, between main buildings. Classes are accessed from a covered walkway (hallway) that runs along the front of the classrooms (see image: Figure 4.13). These covered hallways are often populated by students sitting against classroom walls. Classrooms themselves vary in terms of supplies but all have openings along the top of the room for ventilation (see image: Figure 4.14). The back “wall” of the classroom a metal screen, thus allowing passing students to look into classes. All classroom doors have Master Locks that the teachers have keys for – the doors are usually open when a class is in session and closed/locked when a teacher is not present. Chairs and desks are wooden and worn down with age and much vandalism. Student bathrooms are very simple, undecorated, and did not have toilet paper for students. Sinks for washing hands and brushing teeth are located along the main hallways.
Figure 4.9. Image of the main entrance area of CTP school grounds

Just beyond the gated and guarded entrance to CTP school grounds lies the first “level” of the campus. From this level, sidewalks and steps ascend to other levels and buildings.

Figure 4.10. Image of CTP student bus drop-off area

Located on the first “level” of the CTP campus, both public and private buses drop off and pick up students at the start and end of the day.
Figure 4.11. Image of the CTP campus and surrounding area

Looking down from the cafeteria, the image reveals the gymnasium (far right), soccer field, main office building (behind large rock) and academic buildings on the first level.

Figure 4.12. Image of a school-wide CTP assembly, held in the gymnasium

The CTP gymnasium doubles as the school’s auditorium and is the normal meeting place for assemblies like this one: to announce student government election results.
Figure 4.13. Image of CTP academic hallways

CTP hallways are external to the buildings, covered, and lined with sinks for student use.

Figure 4.14. Image of a normal CTP classroom

CTP classrooms are open to the outside via vents and have wooden tables and desks.
Common sounds at CTP included: students chatting, road transit, weed whacker, and construction sounds (hammer, grinder, saw) – a food processing lab was being updated. Student behavior at CTP was visible in the following observations: students are always outside (even during class); students sitting in the hallways doing homework, talking, or eating; sitting on steps between building levels; sitting at a picnic table area below the main classrooms; the majority of students have cell phones; students often listen to music; student couples are very open about personal touch and public displays of affection.

Students have several options for lunch. The school has its own mini-cafe (Soda) that has the capacity to serve food, snacks, candy, or drinks. Students can also eat in the cafeteria, pack their lunch, or, if they have permission, go home for lunch.

Various sources of data outline the main issues of CTP. One of the most prevalent problems at CTP was the lack of financial resources and funds for supplies and projects. Money is a significant problem in the country and therefore is noticeable in the schools. This lack of funds is felt when students must take practical exams. According to a food processing teacher, students need to bring their own ingredients from home to cook for a practical exam. This teacher stated, “If it doesn’t benefit the school (i.e. create profit), the students have to bring it.” Scholarships are required for student transportation and, according to one teacher, “the majority of students are from far away and need transportation (scholarships).” Transportation scholarships are organized and maintained by a school counselor. Some students, even with a “scholarship,” have a very long commute. Without transportation scholarships, students would have to pay for public
transport from distant towns. For example, to travel from the local town of Santa Tercita (approx. 20 miles), it would cost students more than $3.00 a day. Another significant expense is the administrative costs for students upon graduation. According to a teacher, it costs $100 to pay for each degree the students receive and around $150 for all graduation events (dinner, decorations, and ceremony). CTP does not have a parent association to pay for these additional expenses but there is a community group of mostly retired locals who work to gather money for allocation to student and school needs.

Objective 2: Describe Agricultural Education Provided in Secondary Education in Turrialba, Costa Rica

Of Turrialba public and private secondary schools, two were known to have agricultural education programs. The experimental bilingual high school (LEB) of Turrialba, a 5-year academic school, requires students to take agriculture classes for their first three years but does not have optional follow-up courses after these three years. LEB is a small school with one agriculture teacher and is located in a semi-urban area.

The professional technical high school of La Suiza (CTP) requires students in grades 7-9 to take agriculture classes, but they have options within their “elective” courses. As a technical school, the students select a specialty area at the end of their 3rd year. Three of the five options are agriculturally-related and the specialty area chosen will be reflected in the students’ technical diploma (6-year diploma). The three agriculturally-related specialty areas are: food processing (agroindustry), agroecology (sustainable
agriculture), and general production agriculture. The production agriculture specialty area alternates annually between graduating students with either an animal and plant production focus. CTP is a larger school with 12 teachers of agriculture and several agricultural facilities. CTP is located in a rural area with many surrounding farms. This section discusses agricultural courses, curriculum standards, teacher backgrounds, facilities, and general observations of both of these schools.

A concept that relates to both schools within this objective is the requirement or desired proportion of classroom (theory) to practical time. Both at CTP and LEB, administrators and teachers identified the optimum ratio of time spent on each (in agricultural education) is 40/60 – 40% of class time spent in classroom on the theory and 60% of class time spent outdoors or in the laboratory for practical, hands-on experience.

Agricultural courses. Different agricultural education courses exist depending on the year of the students at the high school. Teachers at both LEB and CTP teach a variety of courses within their focus area. A topic that applies to both schools is the use of the term “taller.” This term, directly translated from Spanish, means “workshop.” However, in the case of describing the classes offered at both schools, “taller” is represented with the word and concept behind “elective” courses. While mandatory at LEB, students can select which “talleres” they want to take at CTP. Agricultural courses of the first three years of high school, therefore, are described as “electives” because they are taken in addition to mandatory academic courses.

Courses at LEB. The chief mission of LEB is to develop a strong integration of academics and language learning. Agricultural education is not an area of major emphasis
at LEB, thus LEB Teacher 1 is the only agriculture teacher. The “agricultural program” at LEB consists of three years of mandatory courses, taken for the first three years of the students’ high school experience. The three courses that are offered, sequentially, are: general agriculture and natural resources, plant sciences, and animal sciences. Students at LEB are split into two groups per year (approximately 25 students each) and take their agricultural courses during different semesters (i.e. group one the first semester, group two the second). Students are in their agricultural “taller” for four periods (approximately 3 hours) for one day a week. The courses follow a format of progressing through general topics, reflected in workbooks that LEB Teacher 1 makes for each class. Tables 4.3, 4.4, and 4.5 contain the units/topics within each year of agriculture (consecutively), as taken from student workbooks (see image: Figure 4.15).
Table 4.3

*Units of instruction for 1st year students at LEB; class – general agriculture and natural resources.*

<table>
<thead>
<tr>
<th>Unit title</th>
<th>Sub-units (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animal sciences</td>
<td></td>
</tr>
<tr>
<td>Plant sciences</td>
<td></td>
</tr>
<tr>
<td>Soil sciences</td>
<td>• Profiles&lt;br&gt; • Technical names&lt;br&gt; • Water&lt;br&gt; • Contamination&lt;br&gt; • Mechanical agriculture&lt;br&gt; • Definition and uses</td>
</tr>
<tr>
<td>Ecology and inter-human relations</td>
<td>• The food supply chain&lt;br&gt; • Biomass/energy&lt;br&gt; • Ecosystems&lt;br&gt; • Habitat&lt;br&gt; • Productivity&lt;br&gt; • Life zones&lt;br&gt; • Predation</td>
</tr>
<tr>
<td>Organic fertilizers</td>
<td>• Composting&lt;br&gt; • Greens&lt;br&gt; • Study of earthworms (vermiculture)&lt;br&gt; • Humus</td>
</tr>
<tr>
<td>Plant cloning, “an ancient technique”</td>
<td></td>
</tr>
<tr>
<td>Unit title</td>
<td>Sub-units (if applicable)</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Medicinal plants</td>
<td>• Extraction and use&lt;br&gt;• Investigation and synthesis&lt;br&gt;• Biodiversity&lt;br&gt;• Examples of medicinal plants</td>
</tr>
<tr>
<td>Food plants</td>
<td>• Humus&lt;br&gt;• Cereals&lt;br&gt;• Legumes&lt;br&gt;• Fruits&lt;br&gt;• Citrus&lt;br&gt;• Sugar plants&lt;br&gt;• Leafy vegetables&lt;br&gt;• Condiment plants</td>
</tr>
<tr>
<td>Ornamental plants</td>
<td>• Multiple uses&lt;br&gt;• Principal types</td>
</tr>
<tr>
<td>Forest plants</td>
<td>• Specific trees in Costa Rica&lt;br&gt;• Forestry nurseries</td>
</tr>
<tr>
<td>Greenhouse types and states of hardy plant production</td>
<td>• 3 major greenhouse types&lt;br&gt;• Technical work in greenhouse nurseries (reproduction, transplanting)</td>
</tr>
<tr>
<td>Substrates (growing medias) and types</td>
<td>• Physical/chemical/biological properties&lt;br&gt;• Types (organic/inorganic)&lt;br&gt;• Water&lt;br&gt;• Artificial</td>
</tr>
</tbody>
</table>
LEB courses are outlined and guided by student workbooks. This image depicts the gardening tool diagram in the plant science workbook for an 8th grade (2nd year) student.
Table 4.5

Units of instruction for 3rd year students at LEB; class – animal science.

<table>
<thead>
<tr>
<th>Unit title</th>
<th>Sub-units (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to poultry</td>
<td>History</td>
</tr>
<tr>
<td></td>
<td>Breeds/types (chickens, turkeys, ducks, doves, geese)</td>
</tr>
<tr>
<td></td>
<td>Characteristics</td>
</tr>
<tr>
<td>(Laying) hens</td>
<td>Raising them</td>
</tr>
<tr>
<td></td>
<td>Breeds</td>
</tr>
<tr>
<td></td>
<td>General characteristics</td>
</tr>
<tr>
<td></td>
<td>Maintenance</td>
</tr>
<tr>
<td>Broiler Chickens</td>
<td>System requirements (very detailed instructions on raising them over a 7-week period*)</td>
</tr>
<tr>
<td></td>
<td>Classification: colors, size, ears, weight</td>
</tr>
<tr>
<td>(Meat) rabbits</td>
<td>Management/raising rabbits</td>
</tr>
<tr>
<td></td>
<td>Production</td>
</tr>
<tr>
<td>Goat production</td>
<td>History</td>
</tr>
<tr>
<td></td>
<td>Classification of breeds (for milk, meat, fiber)</td>
</tr>
<tr>
<td></td>
<td>Direct/indirect products</td>
</tr>
<tr>
<td>Apiculture (honeybees)</td>
<td>History</td>
</tr>
<tr>
<td></td>
<td>Types of production</td>
</tr>
<tr>
<td></td>
<td>Products (honey, pollen, wax)</td>
</tr>
</tbody>
</table>

*Note on broiler chicken content: students previously (many years past) had the opportunity to raise chickens and butcher them, a practical experience that both the teacher and administration are implementing within the new school.
Courses at CTP. For the first three years of class at CTP, students select elective courses in addition to maintaining their general academic course load. The final three years of class at CTP include specifically designated topics and themes within the students’ given specialty area. For all courses at CTP, it is ideal to have a 40/60 split of percent time spent in the classroom (theory) and in the field (practical). Also ideal for course time at CTP is the concept of having the same specialty teacher for all three years of the students’ specialty technical studies. There are approximately four teachers per specialty area in agriculture at CTP, so they usually cycle with the groups of specialty students for the given years.

For the first three years at CTP, students select paired elective courses. The agriculture elective courses from which to select are:

- Sustainable agriculture
- Poultry operations
- Small animal operations (rabbits, goats)
- Bovine operations
- Environmental education
- Fruit and vegetable processing
- Dairy processing
- Plant food processing (crops)
- Animal food processing (meats)
- Production in the garden
- Plant reproduction
For the final three years at CTP, students maintain the same group of colleagues and, optimally, the same main professor for their technical agriculture courses. Over the period of one school week (5 days), students in their technical years optimally take three days’ worth of technical classes (8 hours and 40 minutes of classes per day). These courses can either occur as half-day or whole day courses. Within each trimester, however, students take different course topics. A sample technical course layout of a group of 11th grade (5th year) agricultural production students (with animal agriculture focus) can be seen in Table 4.6.

Table 4.6

*Technical course schedule for 5th year (animal) agriculture production students at CTP.*

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>7:00 – 11:20 AM</td>
<td>Agribusiness principals</td>
</tr>
<tr>
<td>Tuesday</td>
<td>7:00 – 11:20 AM</td>
<td>Animal production</td>
</tr>
<tr>
<td>Wednesday</td>
<td>all day (7:00 AM – 4:30 PM)</td>
<td>Elements of production</td>
</tr>
<tr>
<td>Thursday</td>
<td>all day (7:00 AM – 4:30 PM)</td>
<td>Animal production</td>
</tr>
</tbody>
</table>

The students in this group have all the above classes with the same agricultural teacher, in the same classroom (for theory lectures). The actual content of those courses, however, may not reflect the course title. Teachers often mix course lectures and units because they know they have the same class for all of these time frames.

**Agricultural curriculum standards.** The Costa Rica Ministry of Public Education varies in terms of curriculum mandates. The agricultural education “program” at LEB is not officially qualified by MEP as technical agricultural education, thus does
not have official mandates. CTP, however, is specifically a technical high school and thus has mandated course outlines, objectives, and measures for agricultural curriculum, especially within the final three years of schooling in the specialty areas.

**Curriculum at LEB.** LEB Teacher 1, the agricultural teacher at LEB, designs her course curriculum structure and then sends drafts of these to the school principal for her confirmation and agreement of the content. LEB Teacher 1 uses various resources, such as agricultural books and the internet, to compile her curriculum. The “content layout” for a 7th grade (1st year) introductory agriculture class at LEB is outlined in Table 4.7.

LEB Teacher 1 also develops more in-depth curriculum outlines for approval by the principal. These outlines contain: specific objectives, content, activities, resources and methods, and evaluation. Table 4.8 contains a sample curriculum outline for the first unit of the 1st year agricultural course listed in Table 4.7.
Table 4.7

*General content of 1st year agricultural course at LEB (translated from teacher’s copy)*

<table>
<thead>
<tr>
<th>Unit</th>
<th>Lessons*</th>
<th>“In class work”</th>
<th>“Field work”</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>Introduction and presentation of the agricultural taller. Identify the basic components of agriculture: animal science, plant science, soils, water, and agricultural mechanics</td>
<td>N/A</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>Differentiate the concepts: ecology, ecosystems, photosynthesis, and environment. Break into groups and distribute the areas</td>
<td>Land preparation</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>Understand biodiversity: the existing relationships between different species and conservation of natural resources for sustainable development</td>
<td>Crops planting</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>Identification and classification of natural resources</td>
<td>Crop maintenance</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>Identify types of organic fertilizers: their importance and characteristics</td>
<td>Crop maintenance</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>Recognize different techniques for working/using fertilizers</td>
<td>Crop maintenance</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
<td>Recognize different categories of soil use</td>
<td>Crop maintenance</td>
</tr>
<tr>
<td>8</td>
<td>3</td>
<td>Analyze reproduction (seed and sexual) and propagation (vegetative and asexual)</td>
<td>Crop maintenance</td>
</tr>
<tr>
<td>9</td>
<td>1</td>
<td>Recognize types of asexual propagation, alternatives for asexual propagation and their importance</td>
<td>Crop harvesting</td>
</tr>
</tbody>
</table>

* Only one lesson is taught per week, thus the value represents the number of 2.5 hour lessons spent on the subject
Table 4.8

*Curriculum outline for 1st unit of 1st year agricultural course at LEB (translated from teacher’s copy)*

<table>
<thead>
<tr>
<th>Specific objectives</th>
<th>Content</th>
<th>Activities</th>
<th>Resources/methods</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Recognize the basic components of agriculture</td>
<td>Basic components of agriculture</td>
<td>1.1. The teacher gives brief introduction of the theme.</td>
<td>General technique</td>
<td>1. Recognizing the basic components of agriculture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1.2. In groups of 5, students complete a work guide for the topic.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Identify, in the field of study, the components of agriculture</td>
<td>Field of study of the components of agriculture</td>
<td>2.1. In a round table, review the assigned guide. The students correct their answers in their notebook.</td>
<td></td>
<td>2. Identifying, in the field of study, the basic components of agriculture</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2. Practice (the content) with a game</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Curriculum and course content generally follows the sample outlines given above. In addition to completing assignments in student workbooks, students participate in interactive games or complete projects to reflect specific units of study (see image: Figure 4.16). The following is a quote from LEB Teacher 1 with regards to general curriculum use:

So if the objective is to determine what the basic principles of agriculture (are)... the students must review those principles and identify them, such as ‘what are the basics of agriculture?’ Sometimes we practice with an activity or a game... they get into groups, go over the guide, practice the concepts with memory games, so each objective has specific activities.

*Figure 4.16. Image of student project book within LEB plant science class*

Students in the 2\textsuperscript{nd} year agricultural science class at LEB (plant science focus) must complete a project book for their tree unit. They collected leaves and identified the features of the trees that give it significance.
Curriculum at CTP.

CTP, as a designated professional technical school for agriculture, must follow specific guidelines for curriculum as established and mandated by the Ministry of Public Education, Department for Professional Technical Education.

Within the first three years of school at CTP, students select from a variety of “exploratory” elective courses, both agriculture and non-agriculture focused. The first three years of courses are chosen, by the school, from a list of potential elective topics from MEP. These courses, listed previously, are then mandated by MEP with the following in a curriculum outline: unit of study, objectives, content, procedures, values, learning evaluation. Table 4.9 is a sample curriculum program of study for the 7th grade (1st year) exploratory elective course of “small animal operation.”
Table 4.9

Sample program of study of CTP animal science curriculum.

7th grade exploratory course: small animal operations

Unit of study: broiler chicken production (one objective out of five total for the unit)

(Translated from national curriculum standards PDF, source: (Education, 2013))

<table>
<thead>
<tr>
<th>Objective</th>
<th>Content</th>
<th>Procedures</th>
<th>Values and attitudes</th>
<th>Learning evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apply the basic principles of management records and feeding to the production of broiler chickens</td>
<td>1) Records a. Importance</td>
<td>Application of records</td>
<td>Highlighted value:</td>
<td>For the student:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The responsibility for work development,</td>
<td>Apply the basic principles of</td>
</tr>
<tr>
<td></td>
<td>b. Types</td>
<td></td>
<td></td>
<td>management records and feeding to the production of broiler chickens</td>
</tr>
<tr>
<td></td>
<td>c. Uses</td>
<td></td>
<td></td>
<td>feeding to the production of</td>
</tr>
<tr>
<td></td>
<td>2) Sanitation/health a. Preventative and treatment control</td>
<td>methods for broiler chickens</td>
<td>sufficiently in teams</td>
<td>feeding to the production of</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>broiler chickens</td>
</tr>
<tr>
<td></td>
<td>b. Common diseases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a. Housing</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
b. Weight

c. Daily work

d. Special distribution

4) Feeding

   a. Types of food

   b. Quantity

   c. Water consumption

Application of different food

uses for broiler chicken

production

Application of different food

uses for broiler chicken
CTP is also required to function with regards to national curriculum standards for the technical courses, taken during the last three years of schooling. These courses have very in-depth curriculum mandates. For example, within the specialty area of agricultural production (plant production focus) a curriculum sample is organized under the following hierarchy:

- **Sub-area of study** is “fundamentals of plant science” (320 hours of instruction)
- **Unit of study** is “agricultural mechanization” (60 hours of instruction within the 320 above). This unit is to be administered in 10\(^{th}\) grade (4\(^{th}\) year).
- The three “learning outcomes” of this unit are as follows:
  1) Recognize the components and functions of machinery and equipment used in an agricultural business
  2) Know the basic maintenance of agricultural machinery and equipment
  3) Apply methods and basic agricultural mechanization techniques

Table 4.10 contains a sample curricular outline of learning outcome 2.
Table 4.10

Detailed curriculum sample of CTP agricultural production specialty area

10th grade agricultural production (plant production focus)

Sub-area of study: fundamentals of plant science

Unit of study: agricultural mechanization

Learning outcome (2): Know the basic maintenance of agricultural machinery and equipment

(Translated from national curriculum standards PDF, source: (Education, 2013))

<table>
<thead>
<tr>
<th>Content</th>
<th>Teaching strategies</th>
<th>Learning strategies</th>
<th>Values and overarching themes</th>
<th>Required resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance of agricultural machinery,</td>
<td>Explain the importance of basic maintenance of agricultural equipment and machinery</td>
<td>Explain the importance of basic maintenance of agricultural equipment and machinery</td>
<td>Awareness of how to improve their own environment</td>
<td>(Repair) tools</td>
</tr>
<tr>
<td>equipment, and implements</td>
<td></td>
<td></td>
<td></td>
<td>Agricultural machinery</td>
</tr>
<tr>
<td>Importance</td>
<td>Explain the procedure for developing a program of maintenance</td>
<td>Develop the procedure for developing a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Program of maintenance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preventative maintenance</td>
<td>Illustrate the process/instruments for fulfilling a maintenance program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor repairs</td>
<td>Illustrate the process for continuing a maintenance program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Give practical examples of preventative maintenance of agricultural machinery, equipment, and implements</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Demonstrate minor repair processes for agricultural machinery and equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Complete the instruments of a maintenance program</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Give the process of continued maintenance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Execute basic maintenance practices of agricultural equipment and machinery</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Understand minor repairs of agricultural machinery and equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In addition to following mandated curriculum standards as much as possible, teachers at CTP utilize in-class methods, such as artistic projects (see image: Figure 4.17). In food processing classes, curriculum also includes preparation of meals and foods for examination (see image: Figure 4.18). Hands-on experiences are vital to the technical foundation of CTP and are seen in field work (see image: Figure 4.19) and applications of animal processing (see images: Figures 4.20, 4.21). Almost all CTP practical experiences occur due to the provision of agricultural resources and facilities, outlined below. Instruction methods vary among CTP agriculture teachers. Observations reveal the following instructional methods: lecture (see image: Figure 4.22), reading, PowerPoint presentations, group projects, group work, individual and group investigation (research), and hands-on labor at the farm facilities.

**Teacher backgrounds.** Agricultural teachers at both schools were interviewed in order to gain a better understanding of teacher experience and backgrounds. Teaching and other experience varied greatly but usually applied to the general teaching area of that instructor. Results of teacher background interviews can be noted in Table 4.11.
Figure 4.17. Image of CTP student projects reflecting the different plant parts

Students developed physical presentations and posters of various plant parts to apply the concepts they are learning in CTP technical agriculture courses.

Figure 4.18. Image of practical food processing experience for CTP students

As part of their curriculum, students in the food processing specialty area at CTP are given ample time to conduct tests and develop products in the food processing laboratory.
First year CTP students in an exploratory plant science elective have “practical” experience by preparing terrain and planting plantain plant cultivars.

First year CTP students in an exploratory animal science elective are given “practical” experience in poultry processing by slaughtering the broiler chickens they raised.
Figure 4.21. Image of CTP student processing freshly slaughtered chicken

An agricultural (animal) production senior aiding in chickens processing for the first year animal science elective course (Figure 4.20). The chickens were then sold to the cafeteria.

Figure 4.22. Image of CTP agroecology teacher giving a lecture on ruminant systems

Lecture was a commonly observed method of teaching at CTP.
Table 4.11

*Educational and experiential background of Turrialba agricultural teachers*

<table>
<thead>
<tr>
<th>Teacher, listed by numerical code</th>
<th>General teaching area</th>
<th>Institution* for baccalaureate degree**</th>
<th>Institution* for teaching certification</th>
<th>Institution* for additional degree(s)</th>
<th>Teaching experience prior to current position (# years)</th>
<th>Other experience prior to current position (# years)</th>
<th>Time teaching in current position</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEB Teacher 1</td>
<td>All agricultural electives</td>
<td>Agronomy,*** plant science focus (UCR)</td>
<td>Science education, agricultural focus (UMCA)</td>
<td>N/A</td>
<td>Ag and science teacher in private schools of another town</td>
<td>N/A</td>
<td>5 years</td>
</tr>
<tr>
<td>CTP Teacher 1</td>
<td>Ag production</td>
<td>General agriculture (UNED)</td>
<td>Secondary education (UNED)</td>
<td>N/A</td>
<td>Two different CTPs (one year each)</td>
<td>N/A</td>
<td>2 years</td>
</tr>
<tr>
<td>CTP Teacher 2</td>
<td>Ag production</td>
<td>Agriscience education (UNA)</td>
<td>Agronomy (UNA)</td>
<td>N/A</td>
<td>N/A</td>
<td>Agricultural research at UNA (5 years)</td>
<td>18 years</td>
</tr>
<tr>
<td>CTP Teacher 3</td>
<td>New at the time of study</td>
<td>Ag production</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>CTP Teacher 4</td>
<td>Agroecology and Ag production</td>
<td>Agronomy (UCR)</td>
<td>Secondary education (CIPET)</td>
<td>N/A</td>
<td>N/A</td>
<td>Studied and worked at CATIE, agroforestry (20 years), worked with farmers</td>
<td>18 years</td>
</tr>
<tr>
<td>CTP Teacher 5</td>
<td>Agroecology and Ag production</td>
<td>Agronomy (UCR)</td>
<td>Unknown</td>
<td>N/A</td>
<td>N/A</td>
<td>Private agricultural business (17 years)</td>
<td>11 years</td>
</tr>
<tr>
<td>CTP Teacher 6</td>
<td>Agroecology</td>
<td>Agronomy (UCR)</td>
<td>Unknown</td>
<td>Master’s in organic agriculture (CATIE)</td>
<td>Currently teaching environmental science in another school</td>
<td>Current</td>
<td>Unknown</td>
</tr>
<tr>
<td>CTP Teacher 7</td>
<td>Agroecology</td>
<td>Agronomy, plant science focus (UCR)</td>
<td>Secondary education (UNED)</td>
<td>Master’s in education administration (UAM)</td>
<td>N/A</td>
<td>N/A</td>
<td>7 years</td>
</tr>
<tr>
<td>CTP Teacher 8</td>
<td>Introductory ag courses (talleres)</td>
<td>Agronomy (UCR)</td>
<td>Secondary education (UMCA)</td>
<td>N/A</td>
<td>N/A</td>
<td>Ag teacher at another CTP in the country (5 years)</td>
<td>8 years</td>
</tr>
<tr>
<td>Teacher</td>
<td>Field of Study</td>
<td>Degree</td>
<td>Secondary Degree</td>
<td>Technical Degree</td>
<td>Employment</td>
<td>Experience</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>CTP Teacher 9</td>
<td>Food processing (agroindustry)</td>
<td>Agroindustry technical degree (CIPET)</td>
<td>Secondary education (USAM)</td>
<td>Technical education (TEC)</td>
<td>N/A</td>
<td>N/A</td>
<td>11 years</td>
</tr>
<tr>
<td>CTP Teacher 10</td>
<td>Food processing (agroindustry)</td>
<td>Agronomic engineering (UNED)</td>
<td>Secondary education (UMCA)</td>
<td>Agroindustry technical degree (CIPET)</td>
<td>N/A</td>
<td>Private business selling fruit to large companies</td>
<td>6 years</td>
</tr>
<tr>
<td>CTP Teacher 11</td>
<td>Food processing (agroindustry)</td>
<td>Home Education (UCA)</td>
<td>Secondary education (UNED)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>10 years</td>
</tr>
<tr>
<td>CTP Teacher 12</td>
<td>Food processing (agroindustry)</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

* A complete list of above mentioned institutions (with acronyms) and descriptions can be found in Appendix B (p.135)

**Baccalaureate degrees in Costa Rica are either classified as a 3-4 year “bachiller” (bachelors) or a 4-5 year “licenciatura.” For the purposes of the study, these are not differentiated in describing secondary agricultural teacher backgrounds.

***An agronomy degree from UCR is officially called “agronomic engineering” and includes studies of all components of agricultural science and production. Recently, UCR developed sub-focus areas (options) for this degree.
**Agricultural resources and facilities.** Agricultural education in the schools of study varied greatly with regards to resources and facilities. LEB is not identified by the government as a specialty agriculture school thus does not receive funding for agricultural facilities. CTP has a foundation in technical agricultural education thus has expansive facilities.

**Facilities at LEB.** LEB is located on the campus of UCR with limited space to use for outside of classroom experiences. According to the school’s administration and agriculture teacher, there were not enough facilities at the then current location adequate enough for practical experience in the agricultural courses. The agricultural classroom at LEB is, unlike other academic classrooms, set off from the main LEB buildings with wire walls (see image: Figure 4.23). Within the agricultural classroom, there are four work stations for working with soil and planting seeds. Also at these stations are some horticultural tools, such as shovels and watering cans (see image: Figure 4.24).

LEB was, at the time of the study, planning the construction of a new school in a new location where there would be more flexibility with land use. According to the administration and agricultural instructor, new resources would include: a broiler chicken raising facility, small (organic) garden, and area for organic fertilizer (compost) production. At the time of publication, almost two years following the time of study, the school construction was underway, with new agricultural resources being developed as planned.
The LEB agriculture classroom was the only agricultural area at the time of study. It has wire walls and is set apart from other LEB academic buildings.

The only agricultural tools or specialized equipment were located off to the side of the agriculture room: 4 planting work areas with some gardening tools.
**Facilities at CTP.** The buildings and facilities owned by CTP span approximately 27 hectares (67 acres). Agricultural facilities on the main campus include a food processing laboratory, which was under construction/renovation at the time of study (see image: Figure 4.25). Other than the main campus of the school, with its classrooms and administrative areas, CTP has three farm sites in the area. One farm site is located across the street from the main school area, is approximately 7 hectares (17 acres) in size, and has the following facilities: several acres of land, meat rabbit production house (see image: Figure 4.26), chicken processing area, small shed, and woodshop/work area. One of the other farms is a forest farm of approximately 7 hectares (17 acres). The third and largest farm is approximately 13 hectares (32 acres). It is located about 5 kilometers (10 minutes travel, by bus) from the main campus and has facilities as outlined in Table 4.12.
Students perform food processing (agroindustry) practical experiences in an old laboratory. A new laboratory was being constructed at the time of study to meet needs.

The major animal production component at the farm closest to the school is the open-air facility to produce meat rabbits, which are then sold to the cafeteria.
Table 4.1

Agricultural facilities at the large educational farm at CTP: size = 13 hectares (32 acres)

<table>
<thead>
<tr>
<th>Facility</th>
<th>Components</th>
<th>Observations/details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom</td>
<td>o Chairs (approx. 20)</td>
<td>o Open windows, airy</td>
</tr>
<tr>
<td></td>
<td>o Desks (approx. 20)</td>
<td>o Master lock bolted door</td>
</tr>
<tr>
<td></td>
<td></td>
<td>o Rugged furniture</td>
</tr>
<tr>
<td>Dairy barn</td>
<td>o Free stall barn where they milk</td>
<td>o Cattle seemed well cared for – there is one full time employee for the farm.</td>
</tr>
<tr>
<td></td>
<td>o 2 automated milking machines</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Open barn for calves</td>
<td>o Approximately 13 Jersey cows being milked.</td>
</tr>
<tr>
<td></td>
<td>o Small milk tank</td>
<td>o Milk tank emptied every 3 days</td>
</tr>
<tr>
<td>Dairy goat facilities</td>
<td>o 2 raised structures (on stilts)</td>
<td>o See image: Figure 4.27</td>
</tr>
<tr>
<td>Agriculture</td>
<td>o Large disk harrow</td>
<td>o 3 goat breeds</td>
</tr>
<tr>
<td>machinery</td>
<td>o Small disk plow</td>
<td>o 8 does, 8 kids, 2 bucks</td>
</tr>
<tr>
<td>*Broiler (chicken)</td>
<td>o 8 pen areas for different stages of growth</td>
<td>o See image: Figure 4.28</td>
</tr>
<tr>
<td>house</td>
<td>o Chick hatching area and heat lamp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>o Small disk plow</td>
<td></td>
</tr>
</tbody>
</table>
Hog production barns
- Farrowing barn (4 crates)
- Growth barn
- Fattening barn
- Water sediment canals

Several organic gardens
Plants grown include: celery, *onion, *lettuce, cucumbers, *cilantro, green beans, field corn, *sweet corn, peppers, squash, zucchini, bananas, plantains

Barns were, at the time, out of use due to infrastructure deterioration

See image: Figure 4.29

Students maintain gardens

Some erosion was present due to slopes

See images: Figures 4.30, 4.31

*Denotes products that are grown by the students at the farms which are then sold to the school cafeteria, in addition to rabbits and dairy products (milk/yogurt)
Of the many animal production facilities at CTP, the goat production barn was on stilts and contained about 18 goats of 3 different breeds.

Students in animal production electives and technical courses are required to raise broiler chickens using facilities at the larger farm at CTP.
Students are walking towards upper garden areas at the larger CTP farm. The buildings shown are (left) a horse barn and (right) several hog production facilities.

CTP agriculture teacher 5 is taking first year CTP students to the work area for a plant production elective.
First year CTP students, in their plant science elective, are chatting, after tying up plastic wind breaks around the organic pepper garden.

**General observations of agricultural education.** A common method of data collection for the study was observation: both simple observation and participatory observation. In order to gather a better image of the social aspect of the agricultural education programs in Turrialba, observations were recorded with regards to: student engagement, teacher behavior, and student/teacher interactions – both in the classroom and in the field (if applicable).

**Observations at LEB.** Observations of agricultural education were of two different 7th grade groups and two different 9th grade groups. No 8th grade classes were observed at LEB due to scheduling conflict. All lessons at LEB occur in classrooms due to lack of agricultural facilities.
For the first day of class observation at LEB, 9th grade students (animal science class) were giving final presentations on production of different animals. This final project takes the place of the previously existent unit and experience of raising broiler chickens (UCR eliminated the project 4 years prior due to lack of space). This 9th grade class had 12 students total (5 girls, 7 boys). This class session was held in another room (not the agriculture room) in order to have access to a projector for student PowerPoint presentations. General student/teacher observations were as follows:

- Some students were late
- There was much chatter between students during presentations
- One boy was sleeping in the corner of the classroom
- Three boys did not complete their project
- Students varied in terms of presentation skills – some read from slides, some were very prepared, some presentations were very descriptive while others were simple
- Overall, students seem to enjoy the classroom environment – did not complain
- Teacher had good relationship with students, usually tries to stay on their good side but isn’t afraid to point out an area of attention or improvement in projects

Student presentation topics included:

- Chicken and pig farming (a girl brought her father in for the presentation)
- Milking cow breeds
- Broiler chickens
- Turkeys
- Beef cattle breeds
- Ornamental fish
- Horses
- Dogs
- Quail

General observations of other classes (7th grade, 1st year students in general agriculture) were sorted into three groups:

*Student engagement, student/teacher interaction:*

- Students talk sometimes, few watch during her lecture, but several not paying attention (throwing highlighters)
- Students nonetheless seem engaged, respectful to subject, answering questions, interacting with each other
- Teacher is generally friendly with her students, allowing them to stay after class to talk with her either about content or non-academic matters (see image: Figure 4.32)

*Teacher behavior:*

- Teacher is often late to classes (from 15 minutes to over an hour late)
- For 7th grade lecture on plant science: She stood in front of them, moving a little, lecturing from memory, referencing her book when needed and telling them to keep up with the pages, used a girl’s pencil to give an illustration of a stem, but this was the only visual she used. She listened to and answered her students’ questions fairly well.
• For 9th grade class: There wasn’t much to do, so she chats with them about another teacher’s pregnancy, answers phone during “class” and is playing with her nails while sitting at the desk.

Figure 4.32. Image of LEB agriculture teacher interacting with students

The LEB agriculture teacher seems to have a good relationship with her students, as seen in the image where she is casually talking with them after class.
**Observations at CTP.** Several agricultural classes were observed at CTP that comprised the majority of the agricultural teachers. Observations were collected both in classrooms for lessons and at farm sites for practical experience and are sorted into the following groups (each bullet refers to a different class session observed):

*Student engagement, student/teacher interaction:*

- Very friendly, chill environment, respected the teacher, didn’t complain (11th grade)
- Filled with jokes and energy but seemed to listen, they were kind of passive, trying to use their phones, leave, etc. Showed little interest in the content (7th grade)
- Students talked a lot, but teacher usually just continues with the lecture and didn’t silence them. During lecture, students were looking at phones, zoned out, asking questions/talking (8th grade)
- (Farm experience) students are hyperactive, talkative, didn’t want to do much work after 20 minutes outside but still seemed to enjoy the practical labor (8th grade). Activities of students:
  - Some were clearing grass with machetes
  - Others clearing planting areas with hoes
  - Others digging holes with shovels
  - Some planting the plantain cultivars (that take 10 months to grow) in rows, using twine for making straight lines
- Some fixing the plastic protection used for the peppers (“sewing” twine into it)
- Student and researcher were picking up rotten peppers to prevent spreading and fixing the plastic supports of the pepper plants
- Several students at a time not doing much because of lack of tools and a headache

- Small group (5 boys) – pretty mature and respectful, get along well with teacher but he seemed to let them get away with more. They prepared/studied the wrong content for the exam, but teacher gave them an hour to study before they took it. Students didn’t seem worried (12th grade)

- Students were engaged, taking notes, talking, some left to do group work (11th grade). The lecture on “physiology of animal digestion and absorption of nutrients” contained these topics:
  - Prehension- for each: horses, cows, pigs, and of liquids
  - Mastication
  - Swallowing – 3 phases
  - Gastric movements
  - Rumen diagram (with digestion, absorption, utilization, excretion)
  - Nutrient classification

- Students chatting quietly, listening, taking notes, move around easily – teacher doesn’t seem to mind (12th grade)
• Students were taking practical exam in the food processing lab, one group at a time. Non-testing groups were talking, joking, relaxing – teacher wasn’t paying them much attention (8th grade)

• Students were working in Microsoft Word (in computer lab) under direction of teacher. Students listen but also talking, teasing, helping each other. Several listening to music, surfing the web/Facebook when they finish the current task. Teacher is pretty relaxed with them (10th grade)

• Down time for class, teacher let them study for an exam later in the day, students generally quiet, didn’t seem as interested in class but get along with teacher (10th grade)

• Students chatting quietly in group project work, listened to each other, working diligently (9th grade)

• Students at farm, killing chickens to sell to cafeteria. Seem relaxed, comfortable with the whole process even though it was their first time. 12th grade students there to help with the process. The whole event seemed fun and everyone was engaged and enjoying it (7th grade)

Teacher behavior (each bullet represents a different teacher).

• Strict with his students when they aren’t listening – kicked the students out while he and the researcher were talking but let them get ice cream for him

• More passive with students, seems too busy to really be invested in them, but still addresses areas of confusion. Tells students she will take phones if they didn’t put away. Moved around room, came to front to talk (arms crossed). Generally read
PowerPoint slide then discussed further. Shared a personal story for emphasis of topic. Doesn’t seem to know students’ names. Speaking is generally monotonous.

- Very nice teacher, he knows his content. He is very professional, helpful, experienced, prepared. Seems more oriented towards the paperwork than all of the other teachers.

- She jokes with students easily, approachable. Wasn’t very strict about anything. Walked around room with textbook for reference, reading definitions word for word, writing clearly on the board, talked slowly and repeated the content if students needed it.

- Seemed to get along with students well. Checked on students (in practical exam) occasionally. Ignored students who were talking.

- Pretty shy but not afraid to tell students what to do, helped individually if they needed it but helped by doing the action on the computer rather than instructing them and allowing them to do it. Paces the room, taps foot on the floor.

- Seemed very organized but didn’t act natural in the classroom – seemed slightly uncomfortable. Didn’t interact with students much, left the room when they were given time to study.

- Seemed to have gained respect of students, appears comfortable in the classroom, serious but kind.
Objective 3: Describe the Perceptions of Administrators, Teachers, and Students of Agricultural Education in Turrialba, Costa Rica

Agricultural education in Turrialba can be described using curriculum, agricultural facilities, and teacher backgrounds. Understanding the general perceptions or opinions of agriculture and agricultural education builds a stronger description of the concept in this region of Turrialba. Perceptions were collected using various interview methods and organized into emerging themes. Quotations, transcribed from Spanish, are used to support the general emerging themes that relate to agricultural education in Turrialba, Costa Rica. Ten core emerging themes in perceptions were identified from interaction with administrators at both schools and a local MEP assessor, agricultural teachers at both schools, and agriculture students at both schools.

**Emerging theme 1: Agriculture is vitally important to Costa Rica.** Almost every conversation involving agricultural education and its importance revealed that the general population sees Costa Rica as an agricultural country. Quoted from several study participants was the statement, “we are clearly an agricultural country.” Students, teachers, and administrators recognized the significance of agriculture for local livelihoods and national economy. Quoted by a teacher at CTP, “I think that agricultural education is very necessary in high schools of countries like Costa Rica – countries that are agricultural(ly oriented).” The general importance of agriculture is also seen in a quote by another CTP agriculture teacher, “We eat every day and we plant (the) food that we eat – we are an agricultural country – while we may have lots of services, agriculture is vital.”
Within the general economic significance of agriculture in the country was a perception that agriculture should be sustainable and should be done in a manner that protects the environment. This perspective is seen in a quote (and in the curriculum used) by the LEB agriculture teacher, LEB Teacher 1:

I think that agricultural education involves a student who is learning about the different agricultural areas and natural resource usage... Agricultural education is about teaching students the proper management of natural resource: you must know what you have (resources) in order to know what to produce.

National food security was also expressed as important for the agricultural industry. This is seen in a quote from the vice principal of CTP:

For the country in general, agricultural education is important for food security. This is vital issue for the country. We can identify ourselves, in an international setting, as a country that is not as familiar with the concept of food security. The (population of the) country does not understand that, when we ask other countries for food, they may not have it down the road, because they are supplying it right now. But, for me, it is fundamental that we maintain our productive structure that we can defend ourselves and maintain our nation’s dignity.

Emerging theme 2: Agricultural education is seen as generally important for the daily life of students, in the future, rather than an opportunity to prepare for a career in agriculture – students did not realize career opportunities in agriculture. In both schools, but more prevalent at LEB, agricultural education is seen as an opportunity to teach students basic agricultural skills for their future (non-agricultural)
occupations. This perspective is seen in various quotes by the LEB agriculture teacher, LEB Teacher 1:

For me it is important to teach the technical components so that they all can be a little familiar with agriculture... so many people in the country have other occupations but know about agriculture. Let’s say you’re a doctor; a doctor talks to a lot of people in his work. It would be completely ignorant to talk to someone about agriculture and not have any understanding of it.

A CTP teacher expresses the usefulness of knowing about basic agricultural skills, “Someone’s occupation could be a doctor but they could also have a small hydroponics crop or tomatoes in their house.”

A common conception of students is that there are few job opportunities in agriculture or that agricultural employment does not produce much income. Seen in an interview with 11th grade agroecology students at CTP:

(Researcher) Why aren’t there many students in the three ag-related specialties? Or why aren’t there many students choosing to major in agronomy?

(Students) Because of job opportunities (in agriculture)... they are sometimes less available. Someone may become an agronomic engineer but they cannot get a job.

(Researcher) So you do not believe there are jobs in agriculture?

(Students) It depends... sometimes there are more people in a major than jobs available.
Paired with the misconception of low income in agricultural jobs is the basic understanding of an “agriculturalist.” The following is a comment from LEB Teacher 1 to her 7th grade students at LEB:

People think farmers are poor, but I tell them this isn’t true – farmers make lots of money. Guys, what (the researcher) is talking about isn’t what you think of when we say “farmer.” I am not a farmer, but my degree is “agricultural engineer.” My specialty is plant science, so I could work with a national crop business, like Dole, etc. I am a technical professional – many people study like I did to be involved with numbers, technology, etc.

**Emerging theme 3: Individuals involved in (or previously involved in) the agricultural industry are concerned with the lack of interest in the industry and weak national support for agricultural education.** Visible in many teachers, especially those who have worked in the agricultural industry, is a concern for the future of the agricultural industry. The following quotes clearly identify concerns in this area:

(CTP Teacher 5) I believe there is a huge crisis in Costa Rica. It’s difficult because agriculture has passed from being a primary activity, as it was before, and now it is a tertiary activity; because now there other more profitable activities in the country, such as services. So it’s practically more difficult to work in agriculture. But still, I think that, while we have lots of new technology, someone has to plant so that we can have food... we aren’t going to feed ourselves with computers.
(CTP Teacher 2) I was talking with a man who was very worried because he told me, “I own a farm and livestock, I have my own property, but all of my kids want to study and major in non-agricultural areas: English, doctors, lawyers... so nobody wants to take over my farm.” He will unfortunately have to sell it. I would have liked that he could continue the tradition, but nobody wants to do it – they all want to do other things... it’s sad that nobody wants to study agronomy; nobody is interested in working with the land, being an agriculturalist, rancher, nothing like that.

(Researcher) Why do you think it is like this?

(CTP Teacher 2) Well, young people just don’t want to do it. They don’t like the country (rural areas); the like the city – everything is easier, right? I have two groups (of students) that really don’t like it – they don’t want to work in the fields, they already have the mindset that they want to study other things. But (we) need people to produce (our food).

(CTP vice principal) It’s interesting because, for many here, it’s almost impossible to believe that people would want to be agriculture teachers in the United States (referring to the researcher). So this is an important concept for people to see the need for production and that developed countries still see the importance of production... because they (developed countries) don’t recommend this to us: they recommend commercialization, services, etc. But this is good to know because we need to keep telling our students what the jobs are that will
continue... like the area you are working in, that you are going to be a professional in agriculture, it’s incredible and important.

Also visible in conversations was the regret for a weakened support system by the national government and education system for agricultural education:

(CTP Teacher 4) I think that agricultural education, regrettably, is, on one hand, kind of being abandoned – which is a problem of the education system. It should have greater emphasis because we are clearly an agricultural country.

(LEB vice principal) Sadly, while we live in a very agricultural country, the politics of our country aren’t supportive of agriculture. If the government doesn’t emphasize agriculture, the possibility of success will decrease for students in agriculture. So the success of the students in agriculture, while it can be minimal, is that they study technology or tourism because the government isn’t supportive of agriculture.

**Emerging theme 4: Local agricultural education is perceived as important for small-holder farming families, whereas the agriculture student would go back and work on the family farm.** Seen in the review of literature, smallholder agriculture is an important employer in the canton of Turrialba and the Central Valley region in general. Students, teachers, and administrators identified the region as having many small farmers. Especially at CTP, an emphasis was placed on agricultural education as a support system for students returning to family farms. The following quote from the CTP vice principal supports this theme:
Some of our students continue with agriculture and working their (family) land but there is a high percentage of students also who are working in other areas of production, not their own, but still related to agriculture. This is an agricultural area. We are surrounded by small farms. And our students come from agricultural communities: Guayabo has many small farmers, Santa Cruz has dairy, Tuiz and Pejibaye and here (La Suiza) have much coffee and sugar cane production, so we are all responsible for continuing to provide these necessities.

**Emerging theme 5: Agricultural education optimally comprises a substantial amount of practical application, or experiential learning, in addition to in-class theory – students enjoy being outdoors and administrators, teachers, and parents see it as important.** Administrators and teachers identified the optimum curriculum time split as being 40% of in-class theory and 60% of field work/experiential learning.

Students express a noticeable interest in the field work/experiential learning time. Below are student responses to the question “what is your favorite type of learning?”

- Practical work, on the farm
- It is important that the topic is explained in the classroom but that we carry it to the field to apply it
- (Learning) how to kill chickens and rabbits
- Planting, watering
- The complement of practical and theoretical experiences
CTP students also identified the practical, outdoor experience as an important factor in deciding to specialize in agriculture. The following are 12th grade student responses to the question “why did you decide to study agricultural production?”

- For me, I don’t like sitting and writing in an enclosed area (classroom) all day... I prefer to be in the country with animals, tractors, etc.
- I wanted to be active, but sadly we have to do the theory component too. But what I like most is leaving the classroom to work (in the fields): this is basically why I chose it (agriculture specialty area). Also, (I like that) we get to work with animals.
- I like this specialty for the same reason, because I like being out and taking care of the environment. Like them (other students), I don’t like being inside, when you’re just on a computer... I like being outside, seeing the land.

**Emerging theme 6: There exists a high prevalence of sustainable agriculture and environmentally-friendly practices within the definition of agricultural education.** Noted within the general description of agriculture in the country, natural resource conservation is important to those in agricultural education. LEB Teacher 1, the sole LEB agriculture teacher, explained agricultural education as follows:

Agricultural education is teaching students the proper management of natural resources – to see what (resources) you have and what you can produce... We must do this with science – this is agriculture: to make use of natural resources properly, so as to not contaminate the environment that we enjoy.
The CTP specialty areas of agricultural production and agroecology are mainly defined as differing with regards to sustainable practices taught. A CTP agroecology teacher explains:

The difference between agroecology and (general production) agriculture is very minimal – the only difference is that (general production) agriculture is focused purely on the farm and crops and producing them. Agroecology is producing (crops) without hurting the environment: it is more sustainable than (general production) agriculture. Planting and growing in (general production) agriculture is always done with the goal of producing more food, whereas, in agroecology, the goal is to sustainably produce food.

Students also recognize the importance of sustainability in agriculture by defining sustainable agriculture as:

- Maintaining the garden
- Producing products that come from the farm
- Fertilizing plants
- Organic fertilizers
- Agriculture without chemicals

Students also responded that sustainable agriculture is important because, “agriculture produces all that we eat” and “(we must) know more about different resources.”

Emerging theme 7: Agricultural education at LEB, a non-technical school, is not viewed as being part of an “agricultural education program” rather is seen as
**simply a “workshop” class.** LEB is not required to maintain agricultural courses since its primary purpose is to offer bilingual education. The principal, however, desires to maintain the agriculture curriculum as a component of an integrated educational experience. Nonetheless, LEB agricultural classes are not recognized as a “program.”

This can be noted in the following commentary with the local MEP assessor:

(Researcher) What do you think about the agriculture program at LEB?  
(Assessor) They don’t have an agriculture program.  
(Researcher) The agricultural “taller?”  
(Assessor) Oh, it is just a (single) “taller” (workshop).

Additionally, the LEB agriculture teacher realized and noted the lack of resources and support she had due to her classes not being officially recognized as technical agriculture classes: (LEB Teacher 1 explaining curriculum) “There are a ton of topics, but we don’t have the same resources or space as they do somewhere else, like, for example, in La Suiza (CTP).”

**Emerging theme 8: Technical agricultural education at CTP schools is viewed as giving agriculturally-oriented students the opportunity to either continue studying agriculture in college or start their own agricultural business.** The Costa Rica government, in support of professional technical programs, offers distinct support for CTP graduates. A CTP agriculture teacher explains:

In a technical professional school there are two objectives (for the students): one is that they are able to build their own small business and the other is that they could continue studying (their specialty) in college. There is support from state
banks for them to start their own small business; they loan them money to start their own businesses or to study in college.

Additionally, agriculture teachers see success for their students as is stated by a CTP food processing teacher, “They can have their own business and create quick returns to help pay off university bills.”

**Emerging theme 9: Ministry of Public Education curriculum standards for (technical) agricultural education are seen as very intensive, sometimes not applicable, and almost impossible to complete with the allotted class time.** MEP technical education curriculum standards revealed very extensive expectations of teachers and students for CTP students both in their “exploratory” and “technical” years. Some teachers simply stated that there is too much work and that it is impractical to expect that all of the MEP curriculum objectives will be met. This is seen in a quote by a CTP agriculture teacher:

> There are national curricula for each specialty area of Costa Rican technical schools (51 areas in total): sometimes this curriculum is too heavy, in terms of objectives, and it is difficult for the students to learn it... the “office workers” in San Jose (MEP) who create the curriculum have little classroom experience and don’t always develop the curriculum appropriately.

Other teachers at CTP did not agree with all curriculum standards as being applicable to their technical area, as is seen in a quote by a food processing teacher, “I don’t know why they give us some of the stuff they do... like fast food! But I have to teach it, so I am honest with the students- I teach them the good and bad.”
Emerging theme 10: A large portion of students in agricultural education programs did not have a very high interest in the topic, especially at the non-technical school (LEB) and in the three exploratory years at CTP. Younger students, especially at LEB, did not seem to have a great interest in agriculture as an educational content area. LEB Teacher 1 responded to a general question about perceptions of her agriculture students:

They’re fun but they’re not all interested or active in the classroom... of 90 students, about 50% are interested in the subject... this (agriculture class) is obligatory: they have to take it, whether they like it or not. Tourism may interest them (for their final years), but they may pick it just because they don’t like any of the other topics; because it’s interesting and different.

LEB Teacher 1’s 7th grade students commented on their (mandatory) agricultural class as follows:

- We didn’t know there was an agriculture class when we picked the school
- Agriculture is good because other high schools don’t teach it
- It’s a little hard but the teacher lets us study extra on exam days
- I don’t like the material but I like the teacher
- We don’t like the classroom being so far from campus but we like that it is open

With regards to students being interested in agriculture, one 7th grade LEB student commented, “No (my friends are not interested in agriculture) because the majority are girls and boys from the city.”
Younger CTP students also have minimal interest in agriculture. While required to take agricultural electives, they still have a choice among them. Eighth grade students at CTP, in a plant reproduction elective course, commented on their reasons for selecting (or not selecting) this elective:

- We would have picked other ones because this is really tiring
- I would have like to do cooking
- I like animals

The agriculture teacher for this course, CTP Teacher 5, comments on the question “why do you think your students choose to learn about agriculture, why did they choose this class?”

Some like it. Sometimes, they go through it and want to take it again. Others they choose this because there isn’t space in other electives. In this high school not all students can be in the same specialty area because there is a quota for each specialty. And sometimes there are students who want one specialty but because of the quota, when they reach the mark, they will put the students in another specialty

**Summary**

A descriptive case study of secondary agricultural education in the Costa Rica canton of Turrialba yielded much information. Observations of and input from administrators, teachers, and students of the two schools of agricultural education
comprise the results section of the study. Data collection and presentation is organized with regards to the study’s three main objectives. Within those objectives, specifically objective three, emerging themes were organized and elaborated to support the description of secondary agricultural education.
Chapter 5
Conclusions

Agriculture is of vital economic importance to the Central Valley of Costa Rica. The town of Turrialba is home to many secondary schools, two of which offer agricultural education, portraying the significance of agriculture in the region. These two secondary schools; a semi-public 5-year bilingual school (LEB) and a public 6-year technical school (CTP), reflect the diversity of options in Costa Rica’s secondary education system. While these schools are the only to offer agricultural education in the canton (region), they are very distinct in terms of: size, location, facilities, curriculum, course offerings, teachers, and major issues. Nonetheless, they can be combined to develop a picture of secondary agricultural education in Turrialba. Positive stakeholder perceptions in these schools expose the value of agriculture and agricultural education in the region.

The study, being a rich description of a local secondary agricultural education program, contributes to a greater understanding of global examples of secondary agricultural education. Additionally, the study assists in building a case-based understanding of the relationship between agricultural education and industry in an agriculturally-oriented region.

In accordance with case study standards, methods of data collection were diverse and included: observation, interview, and secondary data sources (physical artifacts and photographs). This chapter discusses, for each of the three study objectives: conclusions,
implications, recommendations for future practice within the subjects of study, and recommendations for future research relating to the study.

**Purpose and Objectives**

The purpose of the study is to describe secondary agricultural education programs in the Central Valley canton of Turrialba, Costa Rica. The following research objectives guided the study:

1. Describe secondary education in Turrialba, Costa Rica
2. Describe agricultural education provided in secondary education in Turrialba, Costa Rica

**Objective 1: Describe Secondary Education in Turrialba, Costa Rica**

In describing secondary agricultural education in Turrialba, factors were researched at national, regional, school, and individual levels. A description of secondary education in Turrialba was developed by reviewing national public education requirements and structures. At the local level, descriptions of education systems were gathered to reveal the diversity of secondary education in Turrialba. In addition to teachers and administrators, students were interviewed to gather an individual-level
perspective of interests, backgrounds, and reasons for attending their secondary school.

Within the secondary schools in the Turrialba region, the two schools of focus in the study were public and semi-public. The Costa Rica education system is mandated by the country’s Ministry of Public Education (MEP). MEP controls financial funding for school maintenance and teacher salaries in addition to mandating specific curricular outcomes for academic courses.

The principal schools of the study were a semi-public, urban bilingual high school (LEB) and a public, rural technical high school (CTP). LEB has 270 students between 5 years and is known as an academic school (1 diploma received upon graduation). CTP has 960 students between 6 years and is known as a technical school (2 diplomas received upon graduation). Because of the requirements of entrance for LEB, the level of academic challenge is seen as slightly heightened in comparison to other public schools, especially considering the English language proficiency that students attain upon graduation. On the other hand, CTP students often drop out before their final year, resulting in a skewed distribution of class populations. This reflects that the academic achievement level at CTP is slightly less prestigious than the other public school in the study. However, CTP is still seen as a proficient school due to the additional technical degree received upon graduation.

Conclusions. Secondary education in Costa Rica, specifically in the Turrialba canton, varies greatly. This variation depends not only on the type of school, curricular focus and its mission, but also on the location and facilities of the school. It is therefore
concluded that, within the limitations of this study, there exists a great diversity of secondary education options available to students living in the Turrialba canton.

**Implications.** The conclusions of the study, with regards to objective one, reveal the diversity of and options for students within secondary education in Costa Rica. The implications of this conclusion are, therefore, that students and their families have several options when selecting which secondary school the student desires to attend. Given the ability that the student can travel to the school and they meet the entrance criteria (i.e. if it is a semi-public school like LEB), Turrialba students entering secondary education are given a diverse array of educational opportunities. Of these diverse opportunities, each school portrays differing factors and emphases in their mission. This implication agrees with the literature about Costa Rica, whereas the nation makes great investments in its educational systems to achieve a 94.9% literacy rate and 100% enrollment of secondary-school aged youth (UNESCO, 2012a; CIA, 2012). High investment in education, therefore, produces diverse options for students enrolling in secondary programs.

**Recommendations for future practice.** Conclusions of objective one emphasize the diversity of secondary education in the Turrialba canton of Costa Rica. While this diversity was discovered during in-country data collection, limitations of data availability prevented an elaborate investigation of secondary education in the literature review. It is therefore recommended that Costa Rican educational authorities, both at the local and national level, make information more available in terms of secondary education options. This would not only provide a stronger foundation for future research studies in
secondary education, but would also increase awareness of educational options for students entering secondary education.

**Recommendations for future research.** With regards to objective one of the study and describing secondary education in Turrialba, the following recommendations are made for future study:

- Additional investigations, with similar methods to this study, of other Turrialba public secondary schools would be beneficial to further develop a picture of secondary education in the canton.
- Data should be collected at the national level (MEP) with respect to local educational programming: specifically, how local data (needs, economy, etc.) are reflected in secondary education programing.

**Objective 2: Describe Agricultural Education Provided in Secondary Education in Turrialba, Costa Rica**

The structure of secondary agricultural education varied greatly between the two schools in the study. Descriptive data collection of agricultural education facilities, students and teachers generally reveal good relationships and varied teaching styles within agricultural education.

LEB, a primarily bilingual school, is not identified by agricultural education, but rather its prestige as a bilingual institution. However, it does offer one agricultural course, which is required for three of five years of student enrollment. The one agricultural
teacher at LEB does not have mandated curriculum because the option to have an agricultural program is under the discretion of the principal, not the government. In addition to lacking curricular resources from the government, LEB agricultural education is limited by a lack of resources and space for experiential learning.

CTP began as a technical agriculture high school and has diversified to include other topics of specialization. The facilities and resources, however, reflect a foundation in agricultural education. There are twelve teachers of agricultural education at CTP, dispersed evenly within the three agricultural specialty areas: agroecology, agricultural production, and food processing (agroindustry). Teacher backgrounds vary with regard to universities and past experience but generally reflect the teachers’ instructional area. Agricultural curriculum at CTP is mandated by the government’s education ministry (MEP) because of the school’s national technical affiliation. Curriculum standards exist for both the exploratory years (1-3) and technical years (4-6) of CTP. Agricultural facilities at CTP are expansive and include: a large farm with gardens, dairy, poultry, and goats; a forest farm; and a small farm with rabbits and poultry processing areas.

**Conclusions.** Based on the data collected to describe Turrialba secondary agricultural education systems, the following conclusion is made of the study: agricultural education in the Turrialba canton is diverse and extensive. Descriptions of agricultural courses, curriculum, teacher backgrounds, and facilities (found in chapter 4) reveal a strong diversity of agricultural education within Turrialba secondary schools. This diversity and strength can especially be seen at CTP, due to its agricultural roots and technical preparatory nature.
Implications. The study concludes that, with respect to objective two and describing agricultural education within secondary education, Turrialba offers significant agricultural education programing to secondary students. This infers, in agreement with the literature, that the local workforce is a driver of secondary education. Almost half of the Turrialba working population is involved in agriculture (Compite, 2006). Therefore, preparatory education is, in the study of Turrialba, adequately reflecting the needs of the local community.

Recommendations for future practice. Results and conclusions of the study that pertain to objective two expose the magnitude of secondary agricultural education programs and their significance in reflecting the Turrialba agricultural economy and workforce. Specifically within this objective of the study, the following are recommended to parties involved in secondary agricultural education in Turrialba:

- Local Turrialba students who are interested in a career related to agricultural sciences should pursue study at CTP, due to its strong agricultural education program and resources.

- Literature review (UNESCO, 2012a) reveals the prevalence of agricultural education and its correlation to local industry needs. Therefore, local residents and youth should be made aware of the significance of agriculture in their local economy in order that they may develop an interest in the strong secondary agricultural education programs in Turrialba.
**Recommendations for future research.** Due to limitations of in-country research time, there remain several areas of potential research to further develop the study within the scope of objective two:

- Further studies, similar to this in nature, should be conducted in Costa Rican secondary agricultural education programs in order to develop a greater picture of nation-wide agricultural education.

- A study should be developed to more clearly define national-level goals and regulations of agricultural education curriculum and successes. This would be conducted by visiting the Ministry of Public Education, especially the professional technical sector, and gathering data through interviews with national administrators.

- In relating occupational opportunities and agricultural education, research should be conducted to identify the career or post-secondary decisions of Turrialba agricultural education graduates. These decisions will better develop an understanding of the preparatory nature of secondary agricultural education in Turrialba.

- A descriptive study of recruitment and retention in agricultural education programs should be developed to understand perceptions of students who either decide to enroll in agricultural education or drop out from current programs.
Objective 3: Describe the Perceptions of Administrators, Teachers, and Students of Agricultural Education in Turrialba, Costa Rica

The study allowed for organization of data into ten overarching themes to reflect the perceptions of agricultural education stakeholders in Turrialba. Taken from interviews with administrators, teachers, and students, the overarching themes are listed as follows:

**Emerging Theme 1.** Agriculture is vitally important to Costa Rica.

**Emerging Theme 2.** Agricultural education is seen as generally important for the daily life of students, in the future, rather than an opportunity to prepare for a career in agriculture – students did not realize career opportunities in agriculture.

**Emerging Theme 3.** Individuals involved in (or previously involved in) the agricultural industry are concerned with the lack of interest in the industry and weak national support for agricultural education.

**Emerging Theme 4.** Local agricultural education is perceived as important for small-holder farming families, whereas the agriculture student would go back and work on the family farm.

**Emerging Theme 5.** Agricultural education optimally comprises a substantial amount of practical application, or experiential learning, in addition to in-class theory – students enjoy being outdoors and administrators, teachers, and parents see it as important.

**Emerging Theme 6.** There exists a high prevalence of sustainable agriculture and environmentally-friendly practices within the definition of agricultural education.
Emerging Theme 7. Agricultural education at LEB, a non-technical school, is not viewed as being part of an “agricultural education program” rather is seen as simply a “workshop” class.

Emerging Theme 8. Technical agricultural education at CTP schools is viewed as giving agriculturally-oriented students the opportunity to either continue studying agriculture in college or start their own agricultural business.

Emerging Theme 9. Ministry of Public Education curriculum standards for (technical) agricultural education are seen as very intensive, sometimes not applicable, and almost impossible to complete with the allotted class time.

Emerging Theme 10. A large portion of students in agricultural education programs did not have a very high interest in the topic, especially at the non-technical school (LEB) and in the three exploratory years at CTP.

Conclusions. Objective three of the study reveals ten emerging themes that relate to the perspectives of administrators, teachers, and students of secondary agricultural education in Turrialba, Costa Rica. From the summation of these ten themes, it can be concluded that agricultural education is generally perceived as a beneficial component of secondary education in Turrialba yet lacks student interest and retention.

Implications. While perceptions of agricultural education in Turrialba are generally positive, there still remains an overarching theme of low student interest. Based on literature that the nation’s economy has been trending away from agriculture and towards tourism and services, students may be focused on nation-wide economy changes rather than local workforce needs and career opportunities. It is for this reason, and the
conclusions of objective three, that the study implies a serious area of concern for the survival of secondary agricultural education in Turrialba due to lack of student interest.

**Recommendations for future practice.** Given positive stakeholder perceptions of agricultural education and the implications of its danger for extinction, recommendations for future practice in the situation are as follows:

- Recruitment programs in secondary agricultural education should be better identified and established in order to make aware the secondary educational opportunities of agricultural science in the Turrialba canton.
- Recruitment and retention programs in Turrialba should emphasize the career opportunities in the region and, therefore, utilize these statistics to promote the previously mentioned recommendation.
- The Ministry of Public Education (MEP) should be more aware of the vital agricultural industry in the Turrialba canton, thus promote and provide financial support for the agricultural education systems reflecting the local workforce.

**Recommendations for future research.** A case study analysis reveals the great potential of gathering data and stakeholder perceptions in building a rich description of a certain phenomenon. In the studied secondary agricultural education programs, there remain perceptions of several stakeholders that could be collected to enrich the study. These areas of interest were unable to be captured due to time restrictions and other limitations of the study. It is therefore recommended that the following areas be investigated to further meet objective three of the study:
• Perspectives of secondary agricultural education should be gathered from parents and families of students involved in the educational programs.

• Perspectives of secondary agricultural education should be gathered from individuals in the local agricultural industry.

• Perspectives of secondary agricultural education should be gathered from individuals in higher agricultural education. For example, further stakeholders could include: professors, researchers, administrators at post-secondary institutions of agriculture in Costa Rica.

• Perspectives of secondary agricultural education should be gathered from recent graduates of the agricultural education programs in the study, both in post-secondary education and the workforce, to qualitatively measure the successes of the programs in the study.

• Perspectives of third party community members who are not directly connected to secondary agricultural education or the agricultural industry should be gathered to develop a greater understanding of the community’s awareness and value of agricultural education.

Summary and Concluding Thoughts

Secondary agricultural education is extremely diverse, especially on a global scale. As identified by a United States based taskforce of agricultural education leaders, global competency in secondary agricultural education can be developed through
providing examples of global agricultural education systems (Taskforce, 2012). The study, therefore, was developed to contribute to the growing body of knowledge of global secondary agricultural education. Further studies should be developed to describe secondary agricultural education around the world. A general recommendation, therefore, is that this study be duplicated in other regions of Costa Rica and, furthermore, Central America and the world. Given a review of literature that reveals the local significance of the agricultural industry, future studies such as this would demonstrate a positive correlation between industry needs and agricultural workforce preparation in secondary education systems.
Appendices

Appendix A

Units of Instruction for LEB Students in the Tourism Elective

Students entering their 4th year at the LEB semi-public bilingual school have the opportunity to select an “elective” area for their final two years. This “elective” involves one lesson per week in one of four elective areas: computer science, accounting, technical drawing (drafting), or tourism technology. Within these four areas, there is a course cap of 20 students in order to maintain an even distribution. The tourism elective is taught by the LEB agriculture teacher and is usually very popular. When asked why students want to take the tourism elective series, the agriculture teacher responded, “because they do not like the other options.” Tables A1 and A2 contain instructional outlines, as translated by the researcher from the LEB teacher’s curricular plans.
Table A1.

*Units of instruction for 4th year students at LEB; class elective – Tourism Technology*

<table>
<thead>
<tr>
<th>Unit title</th>
<th>Sub-units (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to tourism</td>
<td>• Evolution and history of tourism</td>
</tr>
<tr>
<td></td>
<td>• Basic elements and vocabulary</td>
</tr>
<tr>
<td>Geographic location of Costa Rica</td>
<td>• Weather</td>
</tr>
<tr>
<td></td>
<td>• National parks</td>
</tr>
<tr>
<td></td>
<td>• Country facts</td>
</tr>
<tr>
<td></td>
<td>• Population</td>
</tr>
<tr>
<td></td>
<td>• Wildlife</td>
</tr>
<tr>
<td></td>
<td>• Culture</td>
</tr>
<tr>
<td></td>
<td>• Natural resources</td>
</tr>
<tr>
<td></td>
<td>• Health</td>
</tr>
<tr>
<td></td>
<td>• Education</td>
</tr>
<tr>
<td></td>
<td>• Government</td>
</tr>
<tr>
<td>Conservation areas in Costa Rica</td>
<td>• Lists of conserved areas around the country</td>
</tr>
<tr>
<td>National Parks</td>
<td>• General information about Costa Rica healthcare</td>
</tr>
<tr>
<td>National Occupational Health Program</td>
<td>• Relationship between accidents that affect the environment</td>
</tr>
<tr>
<td></td>
<td>• Definition of accidents</td>
</tr>
<tr>
<td></td>
<td>• Job responsibilities</td>
</tr>
<tr>
<td>On the job accidents and prevention</td>
<td>• Prevention of accidents</td>
</tr>
</tbody>
</table>
Table A2.

*Units of instruction for 5th year students at LEB; class elective – Tourism*

<table>
<thead>
<tr>
<th>Unit title</th>
<th>Sub-units (if applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic terms and types of tourism</td>
<td>• Basic elements and vocabulary</td>
</tr>
<tr>
<td></td>
<td>• Economics</td>
</tr>
<tr>
<td></td>
<td>• Employment</td>
</tr>
<tr>
<td>Effects of tourism</td>
<td>• Production</td>
</tr>
<tr>
<td></td>
<td>• Culture</td>
</tr>
<tr>
<td></td>
<td>• Development</td>
</tr>
<tr>
<td>Modes of tourist transit</td>
<td>• In water</td>
</tr>
<tr>
<td></td>
<td>• On land</td>
</tr>
<tr>
<td></td>
<td>• In air</td>
</tr>
<tr>
<td>Culinary/cuisine</td>
<td>• Type of cuisine (natural, vegetarian, etc.)</td>
</tr>
<tr>
<td></td>
<td>• History of culinary arts</td>
</tr>
<tr>
<td></td>
<td>• Costa Rican cuisine</td>
</tr>
<tr>
<td></td>
<td>• Coffee culture</td>
</tr>
<tr>
<td>Hotel studies, part 1</td>
<td>• Organization</td>
</tr>
<tr>
<td></td>
<td>• Types of hotels</td>
</tr>
<tr>
<td></td>
<td>• Offerings</td>
</tr>
<tr>
<td></td>
<td>• Uses</td>
</tr>
<tr>
<td>Hotel studies, part 1</td>
<td>• Rural or urban</td>
</tr>
<tr>
<td></td>
<td>• Nature</td>
</tr>
<tr>
<td></td>
<td>• Beach</td>
</tr>
</tbody>
</table>
Appendix B

Expanded Description of Institutions Attended by Turrialba Agriculture Teachers

Objective two of the study addresses factors that describe secondary agricultural education in Turrialba, Costa Rica. Teacher preparedness in higher education was identified as an important describer of the agricultural programs in the study. Table B1 expands upon the acronyms mentioned in Table 4.11 of the text (Educational and experiential background of Turrialba agricultural teachers) by listing the university title, classification, and major areas of study of each institution. It should be noted that, through interviews with agriculture teachers and sufficient literature review, no Costa Rican university is known to offer teacher preparation programs specifically for secondary agricultural education.
Table B1.

*Listing of higher education institutions attended by secondary agricultural educators in the study*

<table>
<thead>
<tr>
<th>Institution acronym, as appears in Table 4.11</th>
<th>Full title of institution (Spanish)</th>
<th>Full title of institution (English)</th>
<th>Classification of institution*</th>
<th>Major academic areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCR</td>
<td>Universidad de Costa Rica</td>
<td>University of Costa Rica</td>
<td>Public state university</td>
<td>All areas</td>
</tr>
<tr>
<td>UNED</td>
<td>Universidad Estatal a Distancia</td>
<td>State Distance University (distance ed)</td>
<td>Public state university</td>
<td>All areas</td>
</tr>
<tr>
<td>UNA</td>
<td>Universidad Nacional</td>
<td>National University</td>
<td>Public state university</td>
<td>All areas</td>
</tr>
<tr>
<td>TEC</td>
<td>Instituto Tecnológico de Costa Rica</td>
<td>Technical Institute of Costa Rica</td>
<td>Public state university</td>
<td>Technology and engineering</td>
</tr>
<tr>
<td>UMCA</td>
<td>Universidad Metropolitana</td>
<td>Castro Carazo University</td>
<td>Private university</td>
<td>Social sciences</td>
</tr>
<tr>
<td>CIPET**</td>
<td>Centro de Investigación y Perfeccionamiento de la Enseñanza</td>
<td>Center for Research and Improvement of Technical Education</td>
<td>Public university prep</td>
<td>Technical education</td>
</tr>
<tr>
<td>CATIE</td>
<td>Centro Agronómico Tropical de Investigación y Enseñanza</td>
<td>Tropical Agriculture Research and Higher Education Center</td>
<td>Private university (graduate level)</td>
<td>Agriculture and environmental topics</td>
</tr>
<tr>
<td>Institution</td>
<td>Mexican</td>
<td>American</td>
<td>Type</td>
<td>Social sciences</td>
</tr>
<tr>
<td>-------------</td>
<td>---------</td>
<td>----------</td>
<td>------</td>
<td>-----------------</td>
</tr>
<tr>
<td>UAM</td>
<td>Universidad Americana</td>
<td>American University</td>
<td>Private university</td>
<td>(economics, communication, education)</td>
</tr>
<tr>
<td>USAM</td>
<td>Universidad San Marcos</td>
<td>San Marcos University</td>
<td>Private university</td>
<td>Business</td>
</tr>
<tr>
<td>UCA</td>
<td>Universidad Florencio del Castillo</td>
<td>Florencio del Castillo University</td>
<td>Private university</td>
<td>Education</td>
</tr>
</tbody>
</table>

*Institutions in Costa Rica are classified as either “public state university,” “public university prep,” “private university,” or “private university prep.” University prep institutions (called “parauniversitarias”) equate to United States community colleges.

**CIPET merged with several other technical institutions in 2005 to form the “National Technical University,” which offers diverse academic study at its several campuses.
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Minor in Sustainability Leadership

Minor in Spanish

Certificate in Engineering and Community Engagement

Participant: Spanish in the Agricultural Sciences Immersion Experience to Costa Rica, 2012

Semester abroad: EARTH University (Agriculture Education in Region of the Humid Tropics), Costa Rica, 2013


Short term student teaching abroad: UTN (National Technical University), Atenas, Costa Rica, 2014
Honors and Awards

- Student Leadership and Service Award, The Pennsylvania State University, 2014
- Schreyer Honors College Academic Excellence Scholarship, The Pennsylvania State University, 2010—2013
- W. LaMarr Kopp International Achievement Award, The Pennsylvania State University, 2013
- Alpha Tau Alpha National Honorary Agricultural Education Society, Eta Chapter, The Pennsylvania State University, 2012—Current
- Gamma Sigma Delta Honor Society of Agriculture, The Pennsylvania State University, 2013—Current
- Undergraduate International Agriculture Research Competitive Grant for Global Research, The Pennsylvania State University, 2012
- Phi Kappa Phi Honor Society Study Abroad Grant, The Honor Society of Phi Kappa Phi, 2013
- Horace Woodward Scholarship for Excellence in the College of Ag Sciences, The Pennsylvania State University, 2010—2011
- Girton Scholarship for Excellence in Food Science, The Pennsylvania State University, 2010
Association Memberships/Activities

Student Member, Pennsylvania Association of Agricultural Educators, 2010—Current

Student Member, National Association of Agricultural Educators, 2010—Current

Professional Presentations