

# An Exploration of the Formal Agricultural Education System in Trinidad and Tobago

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## Abstract

*A team of nine researchers from the United States spent 10 days exploring the formal agricultural education system in Trinidad and Tobago from primary education through postgraduate education. Data were collected from interviews and observations from students, teachers/instructors, and agricultural producers. The team concluded that (a) the people in Trinidad and Tobago involved in agriculture (teachers, students, and producers) are passionate about agriculture, but believe that the general public demeans agricultural workers and work; (b) Trinidad and Tobago has the capacity to develop a well-trained workforce through a comprehensive agricultural education system that spans from primary education to doctoral instruction, however there was little interaction between the various educational systems; and (c) pedagogical training for agriculture educators at all levels can be improved. Furthermore, conclusions related to nine specific areas of interest are discussed and six recommendations for improving the formal agricultural education system in Trinidad and Tobago are provided. As an exploratory study, the findings and conclusions drawn only begin to shed light on ways to improve human capacity development in Trinidad and Tobago. Thus, future research is warranted to further understand and improve Trinidad and Tobago's human capacity development efforts.*

Keywords: Trinidad; Tobago; agricultural education; human resource development

As one of only four countries worldwide known by the researchers to have a comprehensive agricultural education system, including agricultural teacher education, Trinidad

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and Tobago appear to have the infrastructure in place to build a well-trained, competitive agricultural workforce. Teaching agriculture to students is necessary for any country that “depend[s] on agriculture to feed its people and earn foreign exchange,” as is the promotion of agricultural careers (Ramdwar & Ganpat, 2010, p. 28). Furthermore, secondary and postsecondary agricultural education is critical to rural development and sustainable practices (Food and Agriculture Organization of the United Nations, 1997).

Agricultural education in Trinidad and Tobago is available to students in primary school (5-11 years old), secondary school (12-16 years), and tertiary education (16 years and older) (Ramdwar & Ganpat, 2010). Secondary schools are divided into *prestigious* and *non-prestigious* schools. *Prestigious schools* “are state-assisted but managed by boards associated with various religious denominations” whereas *non-prestigious* schools “are solely state-funded and managed” (Ramdwar & Ganpat, 2010, p. 29). Entrance into *prestigious schools* or *non-prestigious* schools is based on the students’ performance on an entry examination (Ramdwar & Ganpat, 2010). Agriculture is only offered at *non-prestigious* schools, leading to a “perception that agricultural education is for those students who are less academically inclined” (Ramdwar & Ganpat, 2010, p. 29). After secondary school, interested students can obtain a diploma or degree in agriculture from the University of the West Indies (UWI), the University of Trinidad and Tobago (UTT), or the Eastern Caribbean Institute of Agriculture and Forestry (ECIAF) (Ramdwar & Ganpat, 2010). The diploma in agriculture targets students who want paraprofessional jobs in agriculture, while the degree is for those who wish to advance professionally (Ramdwar & Ganpat, 2010).

In response to economic improvement goals, the government of Trinidad and Tobago has launched initiatives aimed at promoting investment in human capital and improvement in economic efficiency, namely Vision 2020 (UNESCO, n.d., pp. 1-2). Vision 2020 encompasses many aspects of economic development, but the most relevant to this study is the diversification of the six main economic sectors, one of which is agriculture (UNESCO, n.d.). This study explored current efforts of human capacity development in formal educational settings in Trinidad and Tobago. The following nine areas of agricultural education were explored: (a) curricula, (b) facilities, (c) pedagogical approaches, (d) teacher education, (e) agricultural organizations, (f) student/instructor relationships, (g) connections between the schools and communities, (h) globalization of the curricula, and (i) entry into agricultural careers. The nine areas of agricultural education were identified based on researcher expertise and interest.

According to Talbert, Vaughn, and Croom (2005), curricula within agricultural education provides an expansive overview of what students should learn from the agricultural education program. However, curricula decisions should not be made by the agricultural educator alone, they should take into account the school system and the local community (Talbert, et al., 2005). Relationships between the agricultural education programs and the community should allow for agricultural education programs to garnish resources that strengthen their program as well as local agriculture (Talbert et al., 2005). The facilities for an agricultural education program often depend on the community in which the program is found and what type of agricultural industry is present (Talbert et al., 2005). Facilities may include classrooms, and a plethora of laboratories that are not limited to the following: (1) animals, (2) plants, (3) aquaculture, (4) food science, and (5) agricultural mechanics (Talbert et al., 2005). Agricultural facilities are then used to employ pedagogical approaches.

Many different pedagogical approaches exist in agricultural education and may include the problem solving approach, questioning, discussion, demonstration, and cooperative learning (Ball & Knobloch, 2005). Additionally, student organizations have been a longstanding component of formalized agricultural education programs and help to provide positive relationships between the student and the instructor and to provide leadership development (Talbert et al., 2005). According to the National Research Council (2009), agricultural employers are calling for graduates who are competent within the areas of international agriculture. One way to ensure students have an understanding of international agriculture is to

infuse international agriculture content into formalized agricultural education courses (NRC, 2009). The relationship between formalized agricultural education programs and the agriculture industry helps agricultural education programs to produce graduates who are ready to enter the workforce (Case & Whitaker, 1998).

Trinidad and Tobago is classified as a *small island developing state*, a self-selected area characterized by “small size, remoteness, vulnerability to external shocks, narrow resource bases, and exposure to global environmental challenges” (Ki-moon, 2010, p. 8). With goals to achieve the Developed Nation Status by 2020 (UNESCO, n.d.), the deficit between agricultural production and agricultural importation must be addressed. To better serve the growing agricultural needs of the country and become self-sustaining as the country moves towards the developed classification, a qualitative study was used to explore current efforts of human capacity development in the formal/mainstream education system in Trinidad and Tobago.

### Conceptual Framework

Human resource development refers to the process of using learning interventions to optimize “human growth, organizational effectiveness, and national development through skills enhancement in the workforce” (Rivera, 1995, p. 66). These learning interventions may occur on the operational or delivery level, the institutional level, or the policy level (Rivera, 1995). Development of the knowledge economy is of particular importance in the agriculture sector due to diversity of the workforce (Rivera & Alex, 2008). In the agriculture sector, human resource development is “designed to increase the knowledge, skills, and learning capacity of farmers, employees in agricultural institutions, and agricultural education students” (Rivera, 1995, p. 66).

Rivera and Alex (2008) identified four major categories of the agricultural workforce: (a) those currently employed in agricultural institutions, (b) those self-employed or working on farms, (c) those preparing to enter the workforce, and (d) those in transition from one agricultural job to another (p. 376). Despite the variety of needs of these categories, Rivera and Alex (2008) identified four ways to provide for human resource development needs: (a) formal/mainstream education, (b) nonformal/extension education, (c) in-service training, and (d) mass-media (p. 377). This study will specifically examine the formal/mainstream aspects of human capacity development in the agriculture sector for those preparing to enter the workforce.

### Purpose and Objective

An evaluation of the formal agricultural education system in Trinidad and Tobago was conducted in order to establish a baseline of knowledge that will allow agricultural educators, agricultural producers, and government officials to gauge the status and effectiveness of the formal agricultural education system. This study will assist agricultural stakeholders in assessing the current state of human capacity building in agriculture education and will serve as a foundational study to improve human capacity building efforts in Trinidad and Tobago. A single objective guided this study: describe the systems of formal agricultural education currently established in Trinidad and Tobago.

## Methodology

### Subjectivity Statement

A subjectivity statement was provided in order to understand the relationship the researchers have with the data and the phenomenon being studied (Glesne, 1999). There were nine researchers involved in this study from three different universities: (a) three agricultural education doctoral students (R1, R2, R3), (b) two agricultural education master's students (R4, R5), (c) one agricultural leadership master's student (R6), (d) one agricultural leadership undergraduate student (R7), (e) one assistant professor of agricultural education (R8), and (f) one associate professor of agricultural education (R9). Six of the researchers have between two and ten years of experience teaching agricultural courses at the middle school and secondary school levels in the United States (R1, R2, R3, R5, R8, and R9). In addition, seven of the researchers have experience teaching at the collegiate level (R1, R2, R3, R4, R5, R8, and R9). The researchers have varying levels of international travel experience, which ranges from extensive international travel experience for some of the researchers and the first time traveling internationally for other researchers.

### Epistemological and Theoretical Perspective

The epistemology represents “the theory of knowledge embedded in the theoretical perspective and thereby in the methodology” (Crotty, 2003, p. 3). Constructionism was used as the *epistemology* for this study because it allows the participants to construct their own knowledge and give meaning to the phenomenon (Crotty, 2003). A theoretical perspective can be described as “the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria” (Crotty, 2003, p. 3). In agreement with Koro-Ljungberg, Yendol-Hoppey, Smith, and Hayes (2009), constructivism was the *theoretical perspective* selected for this study. Constructivism aided the researchers in focusing on the individual experiences of the participant's in regards to agricultural education.

### Design of the Study

A qualitative methodology was used for this study, because this approach allowed the researchers to conduct research in a natural setting and investigate the participants meaning of the phenomenon (Creswell, 1997). According to Denzin and Lincoln (1994):

Qualitative research is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means that qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them. (p. 2)

This study used a generic or basic methodological approach due to its defining characteristics. The basic or generic approach allowed the researchers to identify, describe, and interpret the findings through the use of reoccurring patterns and themes (Merriam, 1998).

The participants were selected through purposeful sampling, because this method allowed the researchers to gain a greater understanding of the phenomenon (Merriam, 1998). In order to be selected for participation in this study, the participants had to be involved in agriculture through the educational system or the agricultural industry. A portion of the participants were selected prior to face to face meetings organized by representatives from the University of the West Indies. Additional participants were selected to participate in the study through their attendance and involvement in meetings that were hosted while the researchers were in Trinidad and Tobago. Participants at the *non-prestigious* secondary school included: (a) administrators, (b) teachers, and (c) students. Professors and students at postsecondary levels from UWI, UTT,

and ECIAF were also included in this study. Extension agents, government officials, and small farmers also participated in this study.

Data were collected from the participants through the use of semi-structured interviews and participant observation. Each of the nine-member research team identified one aspect of agricultural education of which to focus *a priori*, much like a rapid rural appraisal technique (Narayanasamy, 2009). Although each team member primarily focused on one aspect, all team members were included in ongoing discussions throughout the data collection and analysis process. The foci included curricula (R9), facilities (R1), pedagogical approaches (R3), teacher education (R8), agricultural organizations (R4), student/instructor relationships (R7), connections between the schools and communities (R6), globalization of the curricula (R2), and entry into agricultural careers (R5).

Approximately a five question interview guide was developed for each focal area. However, researchers had the flexibility to alter the questions as needed (Merriam, 1998). Researcher documented the semi-structured interviews by taking hand written notes during the interview process. In addition to the interviews, researchers had the opportunity to observe agricultural classes, facilitates, and small farms. Observational notes were taken in order to “maximize the researcher’s ability to grasp motives, beliefs, concerns, and interests” (Dooley, 2007, p. 36). All handwritten notes were later expanded upon and transcribed by the researcher who collected the data.

The qualitative data analysis method used for this study was the constant comparative method because the method allowed the researchers to analyze the data and compare the data to the themes that emerged within each one of the categories. (Creswell, 1997). Glaser’s (1969) four stages of the constant comparative method were used: “ (1) comparing incidents applicable to each category, (2) integrating categories and their properties, (3) delimiting the theory, and (d) writing the theory” (p. 220). Each researcher read through their transcripts twice before extracting themes from the data. Meaningful words or phrases were underlined in an effort to keep data in the original context. The underlined segments of data were then compared to one another and the segments of data that exhibited commonalties were color coded and categorized into themes. Once the themes were identified, each researcher substantiated the themes with the data that were collected.

In order to ensure “that the findings of the study represent the respondents and their context,” the researchers adhered to a rigorous set of standards in an effort to establish trustworthiness (Dooley, 2007, p. 38). Credibility was established through the use of prolonged engagement, persistent observation, triangulation, peer debriefing, and member checking (Lincoln & Guba, 1985). The researchers spent 10 days in Trinidad and Tobago interviewing the participants and making observations. The prolonged researcher experience allowed the researchers to develop rapport with the participants and to observe the participants over an extended period of time (Dooley, 2007). Triangulation was achieved by using multiple researchers and participants who represent different aspects of the education and agriculture sectors, as well as two data collection methods (Lincoln & Guba, 1985). Even though the researchers focused on different aspects of agricultural education, discussions between the researchers helped to solidify or dilute the participant’s statements. Additionally, the multiple data collection methods allowed the researchers to determine if the participant’s statements and viewpoints were consistent within the multiple data collection methods. The researchers participated in peer debriefing by having conversations with trained researchers who were not a part of this research investigation. Peer debriefing allowed the researchers “to test working hypotheses and find alternative explanations” (Dooley, 2007, p. 38). In addition, member checking was conducted in order to ensure that interpretations of the data were what the participant intended to convey (Lincoln & Guba, 1985). During the interviews, the researchers restated the participant’s responses in order to make sure that the response was interpreted accurately. Upon completion of the data collection process, preliminary findings of the study

were shared with the participants through a presentation. The presentation was conducted in Trinidad at the University of the West Indies and the findings were reported on a PowerPoint presentation supplemented by an oral presentation. At the end of the presentation the participants had the opportunity to voice their opinions and concerns regarding the interpretation of the findings.

Additionally, the transferability of the study was enhanced by reporting the findings through the use of detailed data and thick description (Erlandson, Harris, Skipper, & Allen, 1993; Lincoln & Guba, 1985; Merriam, 1988). Dependability and confirmability were addressed by the use of an audit trail, which allowed researchers to document methodological decisions and to trace the data back to its raw state (Dooley, 2007).

## Findings

The following foci guided the organization of the findings: curricula, facilities, pedagogical approaches, teacher education, agricultural organizations, student/instructor relationships, connections between the schools and communities, globalization of the curricula, and entry into agricultural careers.

### Curricula

Two themes emerged from the curricula category: *primary and secondary schools* and *postsecondary schools*.

**Primary and secondary schools.** The curriculum taught in the primary and secondary schools was governed by a rigorous set of standards that included standardized examination that spans the Caribbean region (R8, R9). These standards are administered by the Caribbean Examinations Council (R9). The curricula focused on more practical aspects of agricultural production and included required hands-on projects (R1, R2, R8, R9). Teachers had a curriculum guide that served as the syllabus for the courses they taught and were encouraged to make slight adjustments to the curricula to address local variations in agriculture (R9). Teachers did express a concern over a recent development in which all Form 1 students (approximately 8th grade) would be required to take a common introductory vocational course, instead of a course in agriculture (R8, R9). One teacher thought this might be an advantage as some agriculture teachers were teaching these introductory courses and could recruit more students in to agriculture courses (R9).

**Postsecondary schools.** The research team interviewed instructors and students from three distinct types of postsecondary schools and observed unique features at each. First, UTT is a comprehensive state-run university with campuses throughout the country (R8, R9). The team visited the education branch of UTT and interacted with the agricultural teacher education program. The curriculum at this program was very similar to a US-based teacher education program (R9). Interestingly, the UTT agricultural teacher education program had adopted the mission from the National FFA Organization's Official FFA Manual (2013) "Premier leadership, personal growth, and career success" (p.6) as their mission (R3, R4, R9). Secondly, ECIAF is a postsecondary technical school that recently began offering baccalaureate degrees in biotechnology (R9). ECIAF is widely recognized around the Caribbean as a premier place to gain technical skills in agriculture (R1, R2, R8, R9). Many of the extension personnel interviewed had attended ECIAF (R4, R9). The curriculum at ECIAF was technical in nature and very hands-on (R1, R2, R4, R8, R9). Thirdly, UWI is a multi-national university with campuses in four nations (R9). The campus in Trinidad and Tobago was founded as the agricultural campus (R9). The Faculty of Agriculture (equivalent to a college in the US) had been merged into a Faculty of Science and Agriculture (R9). Lecturers at UWI felt that this diluted the emphasis on agriculture and was an impediment to their work (R9). They were excited because a proposal had been submitted to separate the agriculture departments back into a Faculty of Food

and Agriculture (R9). Students at UWI and ECIAF, as well as alumni from the two programs viewed UWI as being *theoretical* and ECIAF as being *practical* (R1, R8, R9).

## Facilities

One theme emerged from the facilities category: *Laboratories*.

**Laboratories.** Laboratories are utilized at every level of agricultural education in Trinidad and Tobago. In the primary school settings, laboratories differed based on location, but many former students remembered their primary teachers using garden plots (R1). One primary teacher at an urban school expressed that he had created tire gardens around the school because he felt that it was important for students to experience growing plants and there not enough space to have a traditional garden plot (R1). Secondary schools were required to have an external lab that included a garden plot of varying size and broilers or rabbits (R1, R9). However, many UWI students, farmers, and community members who were former students in the secondary programs did not remember using an outside laboratory (R1). At ECIAF, the research team discovered outstanding outdoor and biotechnology laboratories, both of which are integrated into the students' degree programs (R1, R8, R9). At UTT, there were no laboratories evident, although students sometimes completed special projects such as a landscape feature (R1, R8, R9). While at UWI, the research team was able to view several laboratory facilities (R1, R8, R9) and discovered that UWI students complete a six-week course at ECIAF in order to gain hands-on experience in the laboratory facilities (R1). The use of laboratory facilities varied widely between schools and school levels (R1, R8, R9).

## Pedagogical Approaches

Upon data analysis, three themes emerged from the pedagogical approaches data: problem-based learning, project-based learning, and teacher-centered instruction.

**Problem-based learning.** Problem-based and hands-on learning approaches are popular in secondary schools, particularly with groups of students (R5). The research team found that *collaborative learning* was used in the Chaguanas Secondary School agriculture classroom, but primarily for in-class work (R1, R5, R9). However, very few students had *individual* problem-based learning experiences unless it was for their end of series practical exam (R5). According to the agricultural teacher at Chaguanas Secondary School, when the individual experiences were completed, the students were expected to keep records and learn independence (R5). Other members of the research team reported that agricultural education at the secondary level tended to take a hands-on approach or learn by doing approach instead of a lecture-based learning approach (R1, R2). Conversely, another member of the team found that students would still like more hands-on work and better explanations of applications outside of the classroom (R4).

**Project-based learning.** The research team found that project-based learning, such as cumulative projects, were popular at the postsecondary levels (R3, R5). Both UTT and UWI used cumulative projects during which students were expected to present their work to an audience that was invited to observe student presentations (R1, R5, R9). Researchers also noted that at the postsecondary level the use of one-day field trips were common, and during the date collection period, some researchers witnessed a one-day field trip (R1, R3, R6).

When examining secondary agricultural education programs, the research team found that project-based learning was used as a summative assessment tool (R3, R9). Students were required to individually complete two projects, one with rabbits or chickens and the second with planting and harvesting a crop (R3). It was noted by researcher 3 that a final report was completed that included an introduction, budget, actual income and expenditures, and an analysis of the project outcomes to demonstrate a student's ability to think critically and synthesize their learning to the *Ministry of Education*.

**Teacher-centered instruction.** Problem-based learning and project-based learning were used; however, evidence from across the various levels (secondary and postsecondary) suggested a predominance of teacher-centered techniques (R8). Researcher 8 had firsthand knowledge regarding the use of teacher-centered approaches from observing classes at UWI and the Kendall Farm School. Additionally, students interviewed at ECIAF and the Kendall Farm School agreed that lectures with note taking were the most common type of class (R8). Researcher 7 interviewed one UWI employee who attributed forming strong connections with the students to an interactive teaching style. The UWI employee believed that interactive teaching helps students feel more comfortable and connected to their teachers, but noted few instructors utilize active learning strategies (R7).

### Teacher Education

Two themes emerged from the teacher education category: *teacher preparation* and *preservice teacher concerns*.

**Teacher preparation.** Overall, a majority of participants felt that secondary agriculture teachers were well prepared to teach (R1, R8). In terms of job placement, the participants reported that after completing the teacher preparation program, many agriculture teachers were forced to wait a year or more before being placed into government schools, creating a barrier in choosing teaching as a career (R2, R4, R8). Researchers also discovered that many agriculture teachers had a farm or a second job (R1, R2, R5, R8, R9) because of the delay in securing a teaching position and to supplement their teaching income (R8, R9).

Additionally, researchers noted that very few of the university-level lecturers and instructors had any pedagogical training (R8, R9). Teaching assistants at UWI also reported little support to develop their teaching abilities (R1, R9). The teacher educators at UTT similarly had no preparation in pedagogy and none had been secondary or primary school agriculture teachers (R1, R8, R9). However, they all had previous agricultural industry experience. Lecturers at UWI reported struggles with teaching larger classes, as Trinidad and Tobago had recently implemented a policy that allowed many more students to enroll at the university (R9).

**Preservice teacher concerns.** Despite several sources saying that they felt their agriculture teachers were prepared to teach, the preservice teachers had concerns (R1, R3, R5, R8). During discussions with preservice teachers at UTT, Researcher 8 discovered that preservice teachers felt that they were unable to form necessary relationships with their students during student teaching due to the short time (6 weeks) spent student teaching. The preservice teachers at UTT also had mixed feelings about their pedagogical readiness and had concerns about the professionalism of cooperating teachers (R5, R8).

### Agricultural Organizations

Three themes emerged from the agricultural organizations data: *primary and secondary schools*, *postsecondary schools*, and *teacher associations*.

**Primary and secondary schools.** Trinidad and Tobago has a school-based 4-H program (R4, R9), however unlike the US, 4-H in Trinidad and Tobago is a nongovernmental organization (NGO), funded by trustees and grants (R4). To that end, it is important to note that Tobago operates as a separate state and residents sometimes feel disconnected from the national government that is based in Trinidad (R2, R8, R9). The Trinidad and Tobago National 4-H leader commented that 4-H is “bigger in Tobago because the money moves very quickly compared to Trinidad, where it gets tied up in bureaucracy and paperwork” (R4). The Trinidad and Tobago National 4-H association is working to establish 4-H in the primary schools (R4). A secondary teacher reported that 4-H had been in the secondary schools at one time, but that 4-H never really took hold (R9). Another teacher said that they tried to have a 4-H program, but the



program is on hold because the lead teacher is on leave (R4). The students at the same school were unaware of 4-H (R4). An agriculture teacher from a primary school said that he does not have a 4-H program at his school because he wants “to involve the whole school in agriculture” and when he was in 4-H “it is too bureaucratic and dictated by the government” (R4). The teacher educators at UTT indicated that they did encourage their preservice teachers to use 4-H in their programs (R4, R8, R9).

**Postsecondary schools.** The research team identified two student organizations at the postsecondary level. The *Agribusiness Society* (ABS) of Trinidad and Tobago was largely a student-run organization at UWI, with membership being predominantly postgraduate students from the Department of Agricultural Economics and Extension (R1, R4, R9). Many members maintain membership in ABS after graduation including at least two secondary agriculture teachers, one UWI lecturer, and one person that works with the Ministry of Agriculture (R4). The other student organization was the *Agriculture Entrepreneurs* at the UTT Agricultural Education program (R4). This organization was formed for networking to share ideas and lesson plans (R4). However, when a few of the student leaders within the organization graduated, the organization had “fallen by the wayside” (R4).

**Teacher associations.** When asked about a professional association for agriculture teachers, the UTT teacher educators indicated that there is such an association, but the association had not met for over three years (R1, R4, R9). None of the agriculture teachers interviewed mentioned such an association (R1, R9). The UTT teacher educators also expressed that there is very little interaction between the agriculture teachers and extension agents (R2).

### Student-Instructor Interaction

Two themes emerged from the student-instructor data: *student-instructor relations* and *common forms of communication*.

**Student-instructor relations.** The UWI students had a formal relationship with their lecturers (R1, R7). Their relationships are based on respect and a leadership hierarchy can be seen. One UWI undergraduate student said, “professors are seen as teachers, not as mentors. We have very little interaction with them outside of the classroom” (R7). Another UWI undergraduate student indicated that students feel comfortable going to a lecturer’s office hours for questions regarding the class, but students would not go to the office hours just to say hello or have a casual conversation with the lecturer (R1, R7). One UWI employee expressed that a lecturer’s teaching style can make or break a relationship with the students. Openness with students makes for a stronger relationship (R7). The employee went on to say “students come into my office all of the time. I try to make them feel comfortable” (R7). This employee expressed that most lectures do not have strong relationships with their students (R7). In contrast, the UTT students and the ECIAF students seemed to have stronger relationships with their lecturers (R1, R7). The UTT students said that the lecturers in the agricultural education program want to have relationships with their students (R7). They are always there to answer students’ questions (R1, R7). The UTT students did express that not all departments at UTT are as close to their students (R7). The UTT students believed that interactive classes helped build relationships with their lecturers (R7).

**Common forms of communication.** In terms of communication between students and instructors, one researcher noted that every lecturer interviewed said that their students have their cell phone numbers (R7). One instructor said, “How open am I with my students? They have my cell phone number” (R7). Although lecturers are willing to contact students through phone and office hours, students are still opting for email (R7). Email was the most common form of communication between students and lecturers. One student said that “most students prefer to email because it’s not as intimidating as seeing a professor face-to-face” (R7). Facebook was reported as an emerging form of social media communication among Trinidadian students (R7).

Students are utilizing Facebook within the classroom by creating pages for classes and group projects to stay updated and exchange information. Facebook was also used by students to communicate with teaching assistants to ask questions about their class (R7). Student participants indicated that they had not reached out to lecturers on Facebook and were unaware if the lecturers even have Facebook (R7).

### Connections between the Schools and Communities

Researchers examined the connection between the different education levels and the community and found two themes: *educational institution interaction* and *education-community connections*.

**Educational institution interaction.** Based on the observations of the research team, it appeared that though each postsecondary program (UWI, UTT, and ECIAF) was strong on its own, there was little transfer of information between the institutions (R1, R6, R8, R9). Based on her observations, researcher 6 concluded, that each program whether at UWI, UTT or ECIAF had strong programs, but lacked the effort of sharing the information with one another. A lecturer at UWI indicated that he did interact with one of the UTT teacher educators, but only because of a prior personal relationship (R9). This same lecturer also shared that there were a few lecturers that taught at UTT and UWI. There were several instructors at ECIAF that had connections to UWI, often as current or former students (R9). It was commonplace for someone to attend ECIAF for a postsecondary technical degree and then transfer to UWI for baccalaureate and postgraduate education (R9).

**Education-community connections.** Many community leaders reported that the universities shared little information with the farmers (R6). Additionally, negative perceptions may be hindering communication (R6). Participant R6 reported that farmers saw people from the university as unwilling to work and share, while university members saw farmers as stubborn and unwilling to listen. Researcher 4 identified a reason that farmers may be resistant to change, even if the universities were recommending the change. Many growers expressed an interest in organic, IPM, and non-GMO plants (R4), but they reported that they could not afford to lose any profits, making experimenting with varieties or techniques potentially harmful (R4). Researcher 6 did discover that times may be changing, as organizations like the Trinidad and Tobago Agricultural Business Society and community research programs at UWI, UTT, and ECIAF were still growing. The negative perceptions of farmers held by university members and of university members held by farmers is likely hindering the information sharing (R6, R9). In order for the situation to change, the two groups will need to reconcile their differences and determine how to best help farmers make technological advances without losing productivity (R6).

### Globalization of the Curriculum

The themes that emerged from the globalization of the curriculum data were as follows: *importance of international agriculture* and *teaching about international agriculture*.

**Importance of international agriculture.** International agricultural practices were found to be important to farmers in Trinidad and Tobago due to the potential for increased profits (R2). One UWI lecturer said that not only were farmers interested in international agricultural practices, but that UWI emphasizes international agriculture in the extension courses (R2). Students at UWI and UTT agreed that international issues were addressed in their coursework (R2). Despite teaching about international issues, a UTT lecturer said that the students were taught about international agriculture in order to answer questions, not teach students the material (R2). The same lecturer indicated that this was due to a negative perception of importing and international agriculture, and he feared that postsecondary students would drop out of the class if international agricultural practices were addressed (R2). Researchers 4 and 8 reported that Trinidad and

Tobago was attempting to reduce the amount of imported food and increase demand for locally grown products.

**Teaching about international agriculture.** One secondary agriculture teacher indicated that she taught about international agricultural practices, but the secondary students claimed they did not learn about international agriculture (R2). At the postsecondary level, international agriculture was usually addressed through agricultural business courses due to the potential for increasing profits (R2). Based on the data collected, Researcher 2 concluded that international agriculture was rarely infused into secondary and postsecondary agricultural education. Furthermore, the researcher concluded that international agriculture is a somewhat controversial issue in Trinidad and Tobago. Farmers expressed interest in learning about international agriculture, and agricultural business lecturers incorporated international agriculture into their classes. Despite the apparent positive attitudes of these farmers, concerns over teaching international agriculture at the secondary level led the lecturers at UTT to discourage preservice teachers from discussing it during class (R2). Additionally, preservice teachers at UTT said they would not teach about international agriculture because of a lack of resources, but did not specifically mention the resources that would make them successful (R2).

### Entry into Agricultural Careers

Researchers examined pathways into the agricultural workforce and data was categorized into themes entitled *connection to the land* and *barriers*.

**Connection to the land.** The first theme was that people entering the agricultural workforce seemed to have a connection to the land (R5, R8). Students at UWI reported that they had family members who were farmers (R5). Farmers at the farmer's market also expressed that the reason they are involved in agriculture is because of family connections (R5, R9). Other farmers indicated that they inherited the land from their fathers (R4, R5). One farmer indicated that with current land ownership and leasing policies, entering agriculture was challenging for someone without a family connection (R4, R5). Teachers of agriculture, both at the secondary and postsecondary levels also frequently grew up in an agricultural setting (R5). Additionally, for these teachers to own and operate a farm in addition to teaching was commonplace (R5, R8, R9).

**Barriers.** Despite the motivation of many of the people interviewed, the general public viewed agriculture in Trinidad and Tobago as a lower form of work (R4, R5, R8). A professor at UTT said, "the population has lost the concept of valuing agriculture" (R5). Farmers reported that finding entry-level workers was a challenge because of a "culture of doing nothing" and "lost island days" (R4, R5). One farmer indicated that the people involved in agriculture are aging and that youth are less interested in entering agriculture (R5). Students at ECIAF supported this by indicating that many of their friends were deterred from considering agriculture as a career due to the hard work (R5, R8). However, one student at UWI said that farmers might be part of the problem by not promoting their profession (R5).

### Conclusions and Recommendations

Based on the findings and the researchers experiences, the following overall conclusions were drawn: (a) the people in Trinidad and Tobago involved in agriculture are passionate about agriculture, but believe that the general public demeans agricultural work; (b) Trinidad and Tobago has the capacity to develop a well-trained workforce through a comprehensive agricultural education system that spans from primary education to doctoral instruction, however there was little interaction between the various educational programs; and (c) pedagogical training for agriculture educators at all levels can be improved.

In regard to the nine foci, the following conclusions were drawn: (a) curriculum taught in the primary and secondary schools was governed by a set of standards that included standardized

examination that spans the Caribbean region; (b) curriculum at postsecondary institutions varied from *technical* to *theoretical* and this was dependent on the institution; (c) laboratories were utilized at every level of agricultural education; (d) problem-based learning was popular in secondary schools, project-based learning was utilized at every level as a summative evaluation tool, and teacher-centered instruction appeared to be the most common method of instruction; (e) secondary teachers completed teacher preparation programs, but very few postsecondary instructors have pedagogical training; (f) preservice agricultural education teachers were concerned about the brevity of the student teaching experience, had mixed feelings about their pedagogical readiness, and had concerns about the professionalism of their cooperating teachers; (g) agricultural clubs/organizations were present in primary and secondary schools and postsecondary institutions; (h) student-instructor relations were stronger and more developed when the curriculum was more technical in nature; (i) there was little collaboration between postsecondary institutions; (j) farmers and university employees had negative perceptions of each other and this hampered information sharing; (k) international agricultural topics were rarely taught at secondary and postsecondary levels due to a negative perception of importing food; (l) most people entering the agricultural workforce had family ties or connections to agriculture; and (m) barriers to entering the agricultural workforce were the general public's negative perception of agriculture, the type of work required in agriculture, and cultural norms associated with work and work ethic.

To that end, the research team did notice several opportunities for enhancing the system and encourages agricultural educators in Trinidad and Tobago to consider implementing these changes. First, interaction and communication between the various educational programs can be improved, including establishing a connection with the extension programs. Second, there appears to be a need to establish a better outreach program to the general public that promotes the agricultural industry as a whole, but also careers within the industry in Trinidad and Tobago. Third, pedagogical approaches across all levels of education could be enhanced with targeted professional development that demonstrates the pedagogical approaches or teachings methods outlined in Ball and Knobloch (2005). Fourth, the use of co-curricular student organizations could be further developed to provide a mechanism for both professional and personal development. In agreement with Talbert et al. (2005), agricultural student organization should strive to provide leadership development and connect students to the agricultural community. Fifth, teacher educators should consider the validity of the preservice teachers concerns. We recommend teacher education programs examine their curriculum to determine if the length of the student teaching experience could be lengthened. Additionally, we suggest teacher educators investigate the concern of cooperating teacher professionalism. Sixth, teacher-student rapport should be strengthened in courses that tend to be theory-based. Instructors' efforts to improve teacher-student rapport should enhance the learning environment and improve student motivation (Wilson, Ryan, & Pugh, 2010).

As an exploratory study, the findings and the conclusions drawn only begin to shed light on the formal/mainstream (Rivera & Alex, 2008) component of the human capacity development system. With this in mind, additional research should be conducted to further examine each of the nine areas of agricultural education explored in this study. These investigations should provide in-depth knowledge and further understandings of the current human capacity development efforts in Trinidad and Tobago, which can be used to further improve this system. Moreover, this research should also be replicated in other developing nations to aid in their human capacity development efforts. Finally, further research should also explore Rivera and Alex's (2008) other means to provide for human resource development needs: (a) nonformal education, (b) in-service training, and (c) mass-media aspects of the system. Developing the knowledge base in each of these areas should aid Trinidad and Tobago in developing their human capital.

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