

The Forms of Dissonance Experienced by U.S. University Agriculture Students During a Study Abroad to Nicaragua

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Abstract

In spring 2018, nine agriculture students from Louisiana State University traveled to Nicaragua for a study abroad course. During this experience, students explored agricultural industries and engaged in cultural tours as well as in a service-learning project. Evidence has demonstrated that such experiences can transform students' intercultural sensitivity, global knowledge, and views on agriculture. To facilitate such an experience, however, requires educators to design experiences that challenge students' existing values and worldviews – a concept known as dissonance. Mezirow theorized that when individuals reflect critically on dissonance, it spurs a transformational learning (TL) process. However, knowledge of the types of dissonance that initiate TL in study abroad programs is insufficient. This study, therefore, sought to understand the multiple ways that students experienced dissonance during a study abroad course. Through our analysis, four forms of dissonance emerged: (1) environmental, (2) sociocultural, (3) intellectual, and (4) personal. When viewed through the lens of TL theory, the forms of dissonance appeared to shape and influence how students experienced TL as well as their resulting perspective changes. As a consequence, this study provided important insights into how study abroad courses could be designed and delivered to better encourage the maturation of students' perspectives on global issues and problems.

Keywords: agriculture students; dissonance; study abroad; transformational learning

Introduction and Literature Review

As capital, labor, and culture become more globally integrated, it is critical to engage individuals in cross-cultural activities (Myers, 2010). One popular approach that U.S. universities have employed to facilitate such experiences are through study abroad courses (McCleod & Wainright, 2009). Study abroad has been defined as a form of experiential learning in which students gain academic knowledge while also experiencing personal and cultural development in an international context (Bringle, Hatcher, & Jones, 2011). Over the past two decades, study abroad courses have experienced significant growth and diversification (Bringle et al. 2011). Programs range from one week to an entire academic year and can include trips (a) booked through external providers, (b) arranged by university faculty, or (c) through university exchange agreements. Service-learning opportunities that combine

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aspects of study abroad, volunteerism, and academic learning have also grown in popularity over the past two decades (Kiely, 2004; Strange & Gibson, 2017).

The Institute of International Education (IIE) (2018) reported European destinations have remained top choices among U.S. students, although countries such as China, Greece, and newly accessible Cuba are growing in popularity. In accord, the number of students participating in study abroad courses has increased over the past few decades (Strange & Gibson, 2017). For example, in the 2015-2016 academic year, 325,339 university students earned academic credit for completing a study abroad course (IIE, 2018), a more than 50% increase from the 2000-2001 academic year (Klebnikov, 2015). Participating students represented a range of academic backgrounds, with the top field of study reported as science, technology, engineering, and mathematics (STEM) majors. Nevertheless, students from social science fields, such as agricultural and extension education, represented an emerging market of potential growth for institutions of higher education (IIE, 2018).

In the context of agriculture, researchers have examined students' perspectives on the benefits, motivations, and deterrents of participating in international learning opportunities (Bunch, Blackburn, Danjean, Stair, & Blanchard, 2015; Danjean, Bunch, & Blackburn, 2015; Estes, Hansen, & Edgar, 2016; Rackoski, Robinson, Edwards, & Baker, 2018). As a consequence, evidence exists that students often choose to engage in international opportunities because they perceive it will advance their career and employability skills (Briers, Shinn, & Nguyn, 2010; Harder et al., 2015). Students have also reported they were intrinsically motivated to enroll in study abroad courses; however, their forecasted beliefs about the *value* and *cost* of the associated experience also influenced their decision (Rackoski et al., 2018). Therefore, practitioners of study abroad are tasked with facilitating high-impact experiences that deliver the outcomes desired by students (Estes et al., 2016).

Theorists and practitioners agree study abroad courses can be used to achieve outcomes beyond academic learning (Bell, Gibson, Tarrant, Perry, & Stoner, 2014; Kiely, 2004, 2005; Zhai & Scheer, 2002). However, little guidance has been provided to describe the best practices that encourage students to achieve such outcomes. For example, existing evidence on study abroad has demonstrated these programs can transform students' intercultural sensitivity, global knowledge, and views on agriculture (Roberts & Edwards, 2016; Strange & Gibson, 2017). Further, students have also reported improved: (a) personal growth, (b) intercultural competence, and (c) educational and professional outlooks (Briers et al., 2010; Dwyer & Peters, 2004; Lewis & Niesenbaum, 2005; Paige, Fry, Stallman, Josic, & Jon, 2009). However, a deficiency exists currently in regard to providing practitioners of study abroad with the pedagogical acumen needed to facilitate students' acquisition of knowledge and skills across learning domains. Nevertheless, the most commonly reported instructional technique used to promote the achievement of the aforementioned outcomes is to engage students in a critical reflection on their experiences (Kiely, 2004, 2005; Lamm et al., 2011).

The use of reflection in study abroad courses can serve several purposes, "from improving technical proficiency, through growth as a professional, to changing a whole society" (Procee, 2006, p. 238). When facilitating student reflection, Roberts and Edwards (2016) argued practitioners should encourage students to engage in individual reflective processes that allow them to construct their unique understandings. An emerging strategy to encourage critical reflection in higher education is through the use of smartphone applications (Pew Research Center, 2018). Smartphone applications provide a platform to capture video and audio recordings, which allow students to engage in individual, thought-provoking introspection. Smartphone applications can also provide opportunities to offer timelier, honest feedback to students. Such feedback is especially critical in study abroad courses in which time is often limited (Bringle et al., 2011).

Through the use of reflective exercises during study abroad courses, students often begin to more deeply ponder experiences that challenge their existing values and worldviews (Roberts & Edwards, 2016). The disparity between an individual's experiences and their existing assumptions is a concept known as *dissonance* (Kiely, 2004). Dissonance can arise in study abroad courses through a plethora of activities, processes, and interactions (Kiely, 2004). For example, as students begin to come to terms with complex social, cultural, and economic differences in their new surroundings, tensions can often emerge. Although student apprehension is often perceived as negative, Mezirow (2000) argued that dissonance could be used to encourage a change in a learner's perspective. To achieve this, Mezirow (2000) explained that dissonance should be followed by critical reflection. As a result of engaging learners in a critical reflection on their dissonance, *transformational learning* (TL) can be achieved as their conceptual understanding and cultural competence becomes expanded (Kiely, 2004; Mezirow, 1991; Roberts & Edwards, 2016).

To appropriately facilitate dissonance in study abroad programs, it is critical for educators to consider students' developmental readiness (Brewer & Cunningham, 2009), or their ability to receive and process new experiences productively. For instance, some students may not have the empathy and maturity needed to understand how their unique contextual lens may frame their understanding and comprehension of their experiences (Kiely, 2005). Therefore, special consideration should be placed on fostering students developmental readiness before they reach the course's destination (Brewer & Cunningham, 2009). As an illustration, Brewer and Cunningham (2009) recommended that students be required to attend cultural workshops and presentations before departure. These experiences can equip students with an intercultural toolkit and instill them with a sense of place-based knowledge of the course's destination (Brewer & Cunningham, 2009). Another strategy for promoting students' continued developmental readiness during study abroad courses is through technology, such as cellular phones, to capture students' visceral and emotional interpretations of their experiences.

Today, more than 95% of U.S. citizens own a cell phone, with 77% reporting they use a smartphone (Pew Research Center, 2018). Because of this widespread accessibility, smartphone use in university courses has emerged as an attractive option for educators to incorporate technology into their existing instructional practices. Currently, evidence exists on the importance of reflection on study abroad courses (Kiely, 2004, 2005); however, little work has been done to analyze the role of using smartphone technology to facilitate critical reflection, especially when examining students' dissonance. As a result, a dearth of knowledge exists in regard to understanding the multiple ways that agriculture students articulate the *dissonance* they experience during a study abroad course through the use of smartphone technology.

Theoretical Framework

To theoretically ground this inquiry, we used Mezirow's (1978, 1991, 2000) transformational learning theory (TLT). TLT conjectures that significant learning in an individual's life occurs as they make meaning of new knowledge, and as a result, alter their perspective on an issue, topic, or concept (Mezirow, 2000). Therefore, TLT represents a developmental process by which individuals "mov[e] toward more developmentally progressive meaning perspectives" (Mezirow, 1991, p. 192). Mezirow (1991) theorized that TL occurs through 10-phases that transpire after a critical incident, called a disorienting dilemma, serves as a catalyst. He further opined these instances could spark learners to "reassess taken-for-granted assumptions, values, beliefs, and lifestyle habits and, in some cases, completely alter their lives" (Mezirow, 2000, p. 24).

Existing literature on study abroad courses have noted their ability to initiate a transformation of students' perspectives (Roberts & Edwards, 2016; Strange & Gibson, 2017). To facilitate such transformations, however, requires designing experiences that introduce students to a disorienting

dilemma, or *dissonance* (Kiely, 2004; Roberts & Edwards, 2016). Kiely (2004, 2005) argued the level of dissonance that students encounter during study abroad courses influences the transformative process they may undergo. Therefore, he distinguished between low-intensity and high-intensity dissonance. Low-intensity dissonance occurs when individuals begin to *cope* with their new surroundings, and it is less likely to initiate TL. For instance, students who notice differences in regard to their country's customs, traditions, and practices may be experiencing low-intensity dissonance.

On the other hand, high-intensity dissonance spurs students to re-examine their views and make sense of new knowledge and experiences that do not fit within their existing frames of reference. As a result, high-intensity dissonance often yields a transformation in an individual's perspective. For example, clashes among students' understanding of class, race, social status, and human welfare may catalyze high-intensity dissonance. Kiely (2005) explained that high-intensity dissonance might also trigger a sense of disequilibrium, which is theorized to lead to more effective TL for individuals (Brewer & Cunningham, 2009).

Despite these theoretical advancements, however, knowledge of the dissonance that most profoundly initiates TL in study abroad courses remain insufficient, especially in the context of agricultural education. In particular, more understanding is needed to explain the circumstances, processes, and conditions that foreground the dissonance that students might experience. To more intimately investigate dissonance in this study, therefore, students were required to reflect daily on their experiences during a study abroad course.

Background and Setting

The study abroad course under investigation occurred in Nicaragua in spring 2018. Nicaragua is endearingly known as the *Farm of Central America*, and its economy is heavily dependent on the agricultural industry. For instance, 31% of the population is employed in agriculture, and it is estimated that as many as 70% of Nicaraguans engage in subsistence farming practices (World Bank, 2018; World Food Programme, 2018). Tourism in Nicaragua has demonstrated positive growth in recent years, most notably in coastal regions such as Bluefields and the Emerald Coast, and in more established cities in the western half of the country, such as Granada and Managua (The Economic Times, 2018). Although the country, historically plagued by civil war, has made enormous improvements following the end of the Contra War in 1990, myriad social, cultural, and economic issues persist. These include an average highest-grade completion average of 6.5 and poverty figures remaining over 56% (European Commission of International Cooperation and Development, 2018; United Nations Development Programme, 2014). Given the complexity of this context, Nicaragua provided poignant experiences that encouraged students' TL learning.

For example, during the course, students had the opportunity to explore various agricultural sectors including facilities of cattle, coffee, rice, and tobacco producers. Students also observed the production, processing, and management practices of multiple agricultural products. In addition to these educational experiences, students also engaged in cultural and recreational excursions to gain a more complete perspective of Nicaragua. To encourage TL, each student was required to submit daily video reflections using the smartphone application ReCap®. Using this technology, students were asked to reflect on: (a) what they learned, (b) what was different from what they previously experienced, (c) what was similar, and (d) if anything from the day caused them to experience discomfort. Upon completion of the program, students also completed a portfolio by which they reflected further on their experiences through the submission of photos and written statements. Finally, students shared their experiences through a presentation to faculty and peers to help them continue to make sense of how their worldviews shifted as a result of the study abroad course. Therefore, the course's design influenced the purpose of this study.

Purpose, Research Question, and Significance of the Study

This study's purpose was to understand the multiple ways dissonance emerged during a study abroad course. Using this purpose, we developed the following guiding research question: *In what ways did Louisiana State University agriculture students experience dissonance during a one-week study abroad course to Nicaragua?* Because of the importance of dissonance to catalyzing students' achievement of key learning outcomes in study abroad courses (Kiely, 2004; Roberts & Edwards, 2016), the findings from this investigation could be used to help promote the acquisition of skills needed for university agriculture students to thrive in today's workforce (Harder et al., 2015). As a result, this investigation supported the American Association for Agricultural Education's (AAAE's) Research Priority 3: *Sufficient Scientific and Professional Workforce that Addresses the Challenges of the 21st Century* (Stripling and Ricketts, 2016).

Methodology

We approached this study using a constructionism epistemological position (Crotty, 1998). When using constructionism, researchers seek to understand individuals' lived experiences by describing how they made meaning (Crotty, 1998). Using this worldview, we grounded the investigation in Stake's (1995) instrumental case study approach. The purpose of using this approach was to gain an understanding of a particular issue or phenomena (Stake, 1995) through the interpretation of data. For instance, in the study's design, we positioned this investigation to explore the role of dissonance in shaping students' TL by analyzing the following sources of data: (a) the lead researcher's observations and field notes as a participant observer, and (b) video reflections that were completed during the study abroad course. As with many qualitative research designs, the focus of the analysis was on interpretation. Stake (1995) argued that in case studies, researchers:

. . . emphasize placing an interpreter in the field to observe the workings of the case, one who records objectively what is happening but simultaneously examines its meaning and redirects observation to refine or substantiate those meanings. (pp. 8-9)

Therefore, through the interpretation and analysis of a single, bounded case, the focus is to substantiate processes that may be transferred to other contexts, not to assert generalizability (Grandy, 2010; Stake, 1995). For this investigation, we bounded the case by the *unit of analysis* (the study abroad course) and *time* (a one-week experience in spring 2018). Because we emphasized the interpretation of findings, it is essential to address the biases and experiences we held when analyzing the data.

Reflexivity

This study's lead researcher was a graduate student and accompanied students during the study abroad course as a teaching assistant. Therefore, he was able to immerse himself as a participant observer (Patton, 2002), which allowed him to gain a more complete understanding of the data. During the course, he was exposed to similar situations and experiences, forms of dissonance, and internal processes as participants. As a result, he perceived that he also engaged in TL. A second researcher served as the primary instructor of the study abroad course and was responsible for planning and coordinating all of the course's activities and assignments. The other two researchers were faculty at Louisiana State University and have a background in international education, including study abroad courses. These experiences had a profound influence on our interpretation of the data and how we perceived that students experienced dissonance. We address how sources of data were identified and collected in this investigation next.

Data Sources and Collection

After Institutional Review Board (IRB) approval, students were informed of the nature of the study and were asked to sign an electronic disclosure agreement before participation. To investigate this phenomenon, we then analyzed their daily video reflections captured using the smartphone application ReCap®. In total, 52 daily video reflections, by nine ($N = 9$) students, were submitted throughout the program. To achieve a purposeful sample for interpretation (Patton, 2002), however, we selected students ($n = 5$) who submitted a minimum of eight reflections, yielding a total of 44. The reason we limited our analysis to five participants is that some students experienced issues with obtaining a consistent and reliable Wi-Fi connection during the program, resulting in fewer total reflections. Because we perceived we could not gain a holistic understanding of the dissonance experienced by students that did not submit at least eight reflections, we chose to disregard four students from our analysis. After achieving this purposeful sample, we then transcribed the reflections verbatim. Participant transcripts were then made anonymous and were assigned numerical values for reference during analysis.

Data Analysis

To analyze the data, we employed Corbin's and Strauss' (2015) constant comparative method by using three coding procedures: (1) open, (2) axial, and (3) theoretical (Corbin & Strauss, 2015). Open coding was initially conducted on transcripts, with the goal of developing as many unique, substantial codes as possible. We achieved open coding by using Saldaña's (2016) *descriptive, In Vivo*, and *emotion* coding techniques. Beginning with a detailed round of descriptive coding, data were interpreted by the authors, leading to the creation of 333 unique open codes. Following the descriptive phase of open coding, the lead researcher documented findings and procedures using detailed process-oriented memo writing (Saldaña, 2016).

InVivo coding was then employed to capture the sentiments expressed by participants using their own words, as well as to corroborate the authenticity and accuracy of the descriptive codes (Saldaña, 2016). Finally, we employed emotion coding, as the final phase of open-coding. Emotion coding was particularly appropriate for this study because emotions are a central element of students' experiences (Saldaña, 2016). Therefore, emotion coding allowed the researchers to more accurately understand the feelings and sentiments of participants and identify the most transformative moments of dissonance. During the trip, students reported emotions ranging from *mild surprise* to *discomfort* and *inspiration*. Therefore, emotion coding was critical to the open-coding phase because it provided more understanding of students' experiences.

Next, we engaged in the second level of analysis called axial coding (Corbin & Strauss, 2015). Axial coding allowed us to move from the initial phase of open-coding data and reduce the data into distinct categories to enhance the meaning of the phenomenon (Saldaña, 2016). The axial coding phase resulted in the emergence of 13 broad categories. The categories developed during axial coding were then used to facilitate the third level of analysis, called theoretical coding, by which we examined the axial codes using Mezirow's (1991) TLT. The theoretical coding phase helped us make sense of the dissonance experienced by students and also assisted us with further reducing the data. Through the process of continuous analysis and reduction, four themes emerged. The themes represented the forms of dissonance experienced by students as they participated in the study abroad course. Before offering our interpretation of the findings, however, we must address how we upheld standards for qualitative quality in this investigation.

Standards for Qualitative Quality

Lincoln's and Guba's (1985) standards for rigor – dependability, confirmability, credibility, and transferability – were embedded in its design to ensure qualitative quality. We achieved dependability through a consistent external audit of data analysis procedures from members of the research team (Lincoln & Guba, 1985). Meanwhile, confirmability was ensured through systematic and detailed process memo writing by the researchers (Lincoln & Guba, 1985). The lead author, as a participant observer during the study abroad program, also developed a reflexivity journal in tandem with process memos to reduce the bias of researcher effects during the construction of knowledge. Providing a thick description of the research methods and subsequent findings ensured *transferability* (Lincoln & Guba, 1985). Finally, we emphasized credibility by engaging with the phenomena and conducting persistent observations of the research participants. Our role in this study also enabled researchers to gain increased trust with program participants (Lincoln & Guba, 1985), which resulted in more honest reflections. Through ensuring qualitative quality, we gained confidence in the study's emergent findings.

Findings

Based on our analysis, four themes emerged that represent the forms of dissonance – (1) *environmental*, (2) *sociocultural*, (3) *personal*, and (4) *intellectual* – experienced by participants during their study abroad course in Nicaragua. When viewed through the lens of Mezirow's (2000) TLT, the themes demonstrate how Louisiana State University students underwent actionable perspective changes as a result each form of dissonance. To initiate this process, however, students first encountered a disorienting dilemma (Mezirow, 2000), i.e., a new culture, customs, societal norms, and understandings throughout their time in Nicaragua. It should be noted, that participants experienced each form of dissonance at varying levels and at different points throughout the study abroad. A description, with supporting evidence, is provided in Table 1 to help distinguish among each form of dissonance. Then, themes are narratively presented and incorporated into a visual representation at the report's conclusion.

Table 1

A Description of the Forms of Dissonance Identified in this Study

Theme	Description	Example
Environmental	A comparison of geographic and physical environment differences.	Examination of disparities in “climate” and “geography.”
Sociocultural	Considerations of variances in regard to cultural norms and values.	Examining “power,” “privilege,” and “position” in new ways.
Intellectual	Questioning assumptions and the nature of various problems.	Noticing changes in “agricultural practices” such as production practices for “beef cattle” and “controlling pests.”

Table 1

A Description of the Forms of Dissonance Identified in this Study Continued...

Personal	Reexamination of beliefs about self-concept, privilege, and lifestyle.	Recognition of privilege through “technology” and “cellphone dependency.”
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Theme 1: Environmental Dissonance

Upon arrival in Nicaragua, students immediately began to notice *environmental* differences. These discrepancies challenged students' views on concepts such as *sustainability* and agriculture, resulting in some students feeling uncomfortable. One student shared: “I kind of felt a little uncomfortable when I saw all the trash on the side of the road. I was like, “Oh, no, people, please pick up the trash.” It kind of made me sad. . . .” (Participant #1). Other participants explained they were surprised by differences in “climate” and “geography” and the resulting agricultural practices employed by farmers. To illustrate, one student remarked: “I mean we can't grow tobacco everywhere in the US, we don't have mountains everywhere, we don't have the climate they do, and it's not always hot” (Participant #2).

Others, however, were surprised to learn that in Nicaragua, because of a more relatively stable climate, allowed for three individual rice harvests, in contrast to two throughout most of the U.S. Students also noted the similarities between the countries, especially among weather and climate, these views even extended into recreational opportunities presented on the trip. For example, after visiting the Masaya Volcano and other significant cultural sites, Participant #5 explained: “Nicaragua is really different from Louisiana... It's just kind of hot, and there's a lot of like mountains, and hills, and volcanoes even.” These forms of environmental dissonance served as a key foundation as students began to notice conflicts in regard to society and culture between the U.S. and Nicaragua.

Theme 2: Sociocultural Dissonance

As students were immersed in Nicaraguan life, *sociocultural* factors encouraged them to question their existing assumptions. For example, they articulated differences in the country's customs, traditions, and other norms. One student shared, “. . . I was just a little taken aback by just how much poverty there is [in Nicaragua]” (Participant #4). Observing such differences also appeared to help students understand power, privilege, and position in new ways. As an illustration, one student shared, “[In Nicaragua] . . . there is still this huge gap between men and women... it's something [I had] to adjust to” (Participant #1). These discrepancies among societal norms and values were highly evident to students. Nevertheless, they were able to view and understand cultural and societal progress, especially for women and other minorities, occurring in Nicaragua.

For instance, in our fieldnotes, we noted that in the initial hours of the students' arrival, one student was surprised to observe numerous statues honoring noteworthy Nicaraguan women throughout the airport terminal. Thereafter, the student provided a thought-provoking video reflection in which she revealed: “I really appreciated seeing that, it makes me think about what I have in the United States, and what women have fought for, for years, in order for us to get, and I think that's really important” (Participant #5). As students more deeply reflected on the meaning of their sociocultural dissonance throughout the study abroad course, they also began to articulate significant intellectual growth as well.

Theme 3: Intellectual Dissonance

Throughout the program, many students experienced incongruences among knowledge previously regarded as universal. For example, many program participants noted the differences among standard agricultural practices found in Nicaragua, when compared to those of the United States. This was especially true in regard to common livestock practices. Participant #5 explained: "I learned a lot ... like that they raise beef cattle much differently than we do in the United States. Like they don't castrate them, all kinds of stuff."

Such discrepancies in students' understandings of the differences in production practices between Nicaragua and the U.S. illuminate critical intellectual shifts that students' experienced. In another circumstance, after being informed of a rice farm's management of local hawk populations for pest control, Participant #2 commented: "I thought it was really cool seeing the ways they tried to control pests, without using pesticides." Events such as these were frequent and numerous throughout the trip, and the challenge to students' existing *personal* assumptions became more evident.

Theme 4: Personal Dissonance

The final theme reflected the *personal* forms of dissonance experienced by students. Personal dissonance referred to the conflicts that students encountered in regard to their lifestyle, self-concept, and direction for the future. For instance, one student explained that through her experience in Nicaragua she began to reexamine her relationship with technology. She explained: "I'm really noticing. . . how dependent I am on my phone. I am constantly checking it, even though I know that I don't have a connection, It's kind of hard to get used to. . ." (Participant #4). Students also began to recognize their privilege more fully and reconsider their life course. One student solemnly remarked: "It makes me think about my own life, and about how privileged I really am to grow up and not have to worry about not having food or things like that" (Participant #4). The impacts of reflecting on these personal disparities were some of the most powerful reported during the program. One student shared: "I don't know, this trip really has given me a lot of food for thought, and a lot of direction in planning where I think I need to be going [in the future]" (Participant #3).

Conclusions

This investigation sought to understand the multiple ways that [State] University agriculture students experienced dissonance during a study abroad course to Nicaragua. To accomplish this, we used Mezirow's (1991) TLT to interpret the types of dissonance that most profoundly encouraged a perspective transformation, or worldview shift, for students as a result of their experiences in Nicaragua. Through the interpretation of the data, four forms of dissonance emerged: (1) *environmental*, (2) *sociocultural*, (3) *intellectual*, and (4) *personal*. As such, participants in this study experienced a range of *low* and *high* intensity dissonance (Kiely, 2004). We conclude that each form of dissonance presaged participants' transformative shifts. Further, findings also offered new dimensions for Mezirow's (1991, 2000) TLT by more evocatively identifying and describing the forms of dissonance that transpired after participants experienced a disorienting dilemma, i.e., the study abroad experience. And as a result, underwent a *perspective change* on global issues and problems in agriculture (see Figure 1).

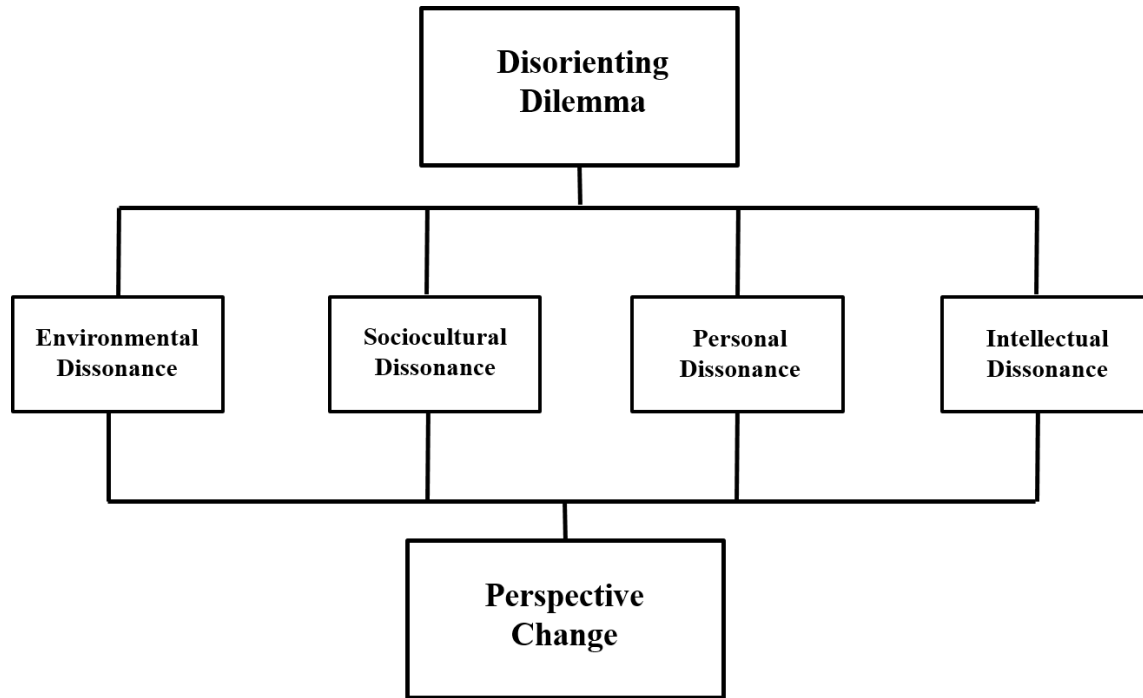


Figure 1. A visual representation of the study's theory-building advancements for Mezirow's (1978, 1991, 2000) TLT.

The findings, therefore, provide valuable insight into the ways in which study abroad courses could be modified to emphasize students' perspective transformation on global issues better. Previous research on study abroad in the context of agriculture has primarily focused on what motivates or deters students to participate (Danjean et al., 2015; Estes et al., 2006; Rackoski et al., 2018); however, less attention has been devoted to understanding how dissonance may shape students' learning outcomes. To situate the findings of this study in the literature, we next provide conclusions for each form of dissonance identified in this investigation.

The first theme, *environmental*, referred to the conflicts that students experienced in regard to their existing environmental assumptions. In particular, participants articulated they were surprised by climatic and geographical differences between Nicaragua and the U.S. and the resulting implications for production agriculture. This finding supports existing evidence (Kiely, 2004, 2005; Roberts & Edwards, 2016), but also adds dimensions to the literature by illuminating how environmental elements of students' experiences may serve as an early form of dissonance. For example, many students reported exhibiting environmental dissonance in their initial video reflections. As a consequence, we conclude that a chasm among students' understandings of climate and geography served an important early catalyst for encouraging students' global perspectives to develop and expand.

Students reported *sociocultural dissonance*, the second theme, during moments as they critically analyzed differences among cultural norms and values in the U.S., and what they observed in Nicaragua. As an illustration, students spoke about discrepancies in regard to Nicaragua's gender equality as well as variances concerning power, privilege, and position in shaping individuals' sense of agency. We conclude, therefore, that these experiences profoundly influenced shifts in students' perspectives. In the agricultural education literature, Conner and Roberts (2015) noted that cultural forces often emerge during study abroad courses; however, they explained that such aspects ". . . did not have a major impact on the participants" (p. 167). Bunch, Rampold, Cater, and Blackburn (2018)

also reported mixed results in regard to students' cultural competence development by arguing that although students articulated some growth during a study abroad experience they "did not progress fully through all competencies needed to be considered proficient. . ." (p. 130). Therefore, findings from the second theme deviate from the existing literature on study abroad courses in agricultural education.

Participants noted aspects of *intellectual dissonance* when they encountered problems and solutions that were different from their previously held beliefs. Specifically, students voiced this form of dissonance as they pondered discrepancies they witnessed concerning agricultural practices, which often contrasted from the knowledge they acquired in their university coursework. We conclude that such dissonance helped students better understand the role of local knowledge and problem-solving as they negotiated meaning and matured intellectually. Currently, scant evidence exists on the role of intellectual dissonance for agricultural-focused, study abroad courses. The final theme, *personal dissonance*, reflected the contradictions that students reported concerning their self-concept, privilege, and lifestyle. For example, students began to reevaluate their relationship with technology and whether their anticipated life course charted a meaningful trajectory – a form of high-intensity dissonance (Kiely, 2004). We conclude that personal dissonance helped students reflect on their positionality during the course and how they could make changes to become better agriculturalists and global citizens.

Discussion, Implications, and Recommendations

Over the past two decades, the frequency in which university students have earned academic credit through study abroad courses has increased dramatically (IIE, 2018). During this time, the definition, parameters, and understanding of study abroad has also expanded. For example, previous research (Roberts & Edwards, 2016) has called for more attention to be placed on the design and delivery of study abroad courses to encourage the maturation of students' perspectives on a range of global issues and problems. However, little evidence has been reported on the specific types of events, forces, and experiences, i.e., *dissonance*, that presages such perspective transformations.

To address this deficiency in the knowledge base, this study identified the forms of dissonance that foregrounded the transformation of university agriculture students' perspectives during a study abroad to Nicaragua through the use of smartphone technology. Such knowledge is critical because practitioners could use this information to more purposefully address the dissonance students may experience. For example, individual and group reflective sessions, that feature the forms of dissonance identified in this study, could be embedded throughout future study abroad courses. Using this approach, students could more deeply consider connections regarding the similarities and differences between their host country and native culture, which promotes the expansion of their global mindedness (Bunch et al., 2018). We also recommend that future research more purposefully investigate the forms of dissonance to further define and expand their parameters. Because of the theoretical advancements offered as a result of this investigation, we also recommend that additional efforts be conducted to examine the utility of Mezirow's (1978, 1991, 2000) TLT for the study abroad literature. For example, future investigations should explore the degree to which university agriculture students experience the forms of dissonance identified in this investigation as they engage in varying study abroad durations, cultures, and geographic locations.

As the blurring of borders between nations steadily increases (Friedman, 2006), the production, as well as the delivery of goods and services, is also becoming more globalized. As a result, it is essential that students enter the workforce with the global competence needed to communicate and cooperate with individuals from diverse backgrounds (Friedman, 2006). Findings from this investigation suggested that students experienced discomfort as they engaged with individuals in a new culture. However, as a result of their participation, they reported a greater understanding, tolerance, and

respect for individuals from differing cultural backgrounds. More work, therefore, is needed to understand the role that study abroad courses may play in improving students' employability skills and workforce readiness in agricultural education. For example, could study abroad courses help instill preservice teachers with the dispositions they need to lead classrooms in the 21st Century and beyond? If so, study abroad course should be designed more purposefully to encourage the acquisition of such learning outcomes. We recommend future research more intimately explore the connection between study abroad experiences and the development of students' positive professional attributes.

Previous researchers have criticized short-term, study abroad courses because of their lack of potential to encourage TL (Fitzsimmons, Flanagan, & Wang, 2013; Stroud, 2010). However, many students experience financial constraints, familial resistance, or other obligations which prohibit them from participating in more in-depth experiences. Findings from this investigation demonstrated the transformative potential of a one-week experience. Moving forward, therefore, we recommend that less focus be placed on the duration of study abroad courses. Instead, practitioners should begin to place more concern on understanding the processes, such as dissonance, that shape how students make sense of their experiences. Finally, practitioners should use the findings from this study to modify the design and delivery of their study abroad courses to facilitate transformative experiences for students more systematically.

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