

DEVELOPMENT OF INTERCULTURAL COMPETENCE THROUGH EMBEDDED COURSE CURRICULUM

by

Jacey Lynn Wickenhauser

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THE PURDUE UNIVERSITY GRADUATE SCHOOL
STATEMENT OF COMMITTEE APPROVAL

Dr. Elizabeth Karcher, Chair

Department of Animal Sciences

Dr. Elizabeth Flaherty

Department of Forestry and Natural Resources

Dr. Paul Ebner

Department of Animal Sciences

Approved by:

Dr. Zoltan Machaty

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ABSTRACT

In today's global environment, agricultural students need the skills to thrive among a workforce made up of individuals with diverse experiences and perspectives. One promising way to prepare students is through the development of intercultural competence (IC). This thesis addresses several different methods of developing IC in undergraduate students. Chapter 2 addresses incorporation of intercultural interventions into a short-term study abroad program coupled with and a follow-up semester-long on-campus companion course to specifically target empathy development. The study found that overall students did not increase significantly on the IDI, but did show positive growth in empathy development throughout the semester. Chapter 3 describes differences in IC of students completing intercultural learning (ICL) assignments throughout a face-to-face introductory animal agriculture course compared with students not completing ICL assignments. The intervention group showed significant increase according to the IDI and increased on average 9.46 points. In addition, the intervention group increased significantly more than the control group (87.54 ± 2.09 vs. 94.76 ± 1.67) ($p < 0.004$; $df=1$; $f=13.23$).

Studies described in Chapter 4 build on those of methods followed a similar approach to the methods discussed in Chapter 3 but examine the impact of including reflection based ICL assignments using global animal agriculture as a medium. Notably, the course also occurred in an emergency remote learning setting during the COVID-19 pandemic. Results from the study discussed in Chapter 4 showed that the intervention group increased significantly more than the control group (86.75 ± 2.11 vs. 95.29 ± 2.35 ; $p < 0.004$). In addition, the intervention group also showed positive results in developing the specific skill of empathy throughout the semester.

The last study discussed in this thesis (Chapter 5) details the process of creating and validating a scale to specifically measure the competence levels in level of undergraduates'

essential skills in undergraduates. Cronbach's alpha was reported for each skillset that was being evaluated and deemed acceptable.

Each of the studies discussed was designed to fill gaps in the literature regarding skill development in animal science undergraduate students. The development of such skills, and IC in particular, is necessary for all students whether they pursue careers with as possible the opportunity to develop these skills, not just those who participate in international elements. As such, developing validate means to provide students opportunities to hone such skills is necessary to student future success. Toward this end, the studies described here seek to measure the efficacy embedding intercultural learning into undergraduate agricultural curriculum at providing such opportunities.

CHAPTER 1. LITERATURE REVIEW

1.1 Introduction

Students pursuing careers in agriculture and food product require a much different skillset than what would have been expected just 20 years ago. Traditionally, agriculture was viewed as a hands-on industry where students went to college to learn highly technical skills related to farming or animal husbandry. The last few decades have brought a shift in that school of thought. Agricultural industries now need students with skills in areas such as communication, leadership, teamwork, the ability to work across culture, and other skills that recently were seen as less important for success in agriculture careers (Goecker et al., 2015). In turn, professionals in academia and industry alike are aiming to provide students opportunities to develop these skills while in university. There is growing interest in fostering the development of intercultural competence in students in effort to facilitate their success in globalized markets and industries. The research presented in this thesis describes different methods of teaching intercultural competence their efficacy in preparing students for a global and diverse workforce. The results can be used as models to develop intercultural competence in undergraduate students not only in agriculture, but well-beyond.

1.2 The Globalization of Agriculture

The establishment of the United Nations in 1945 marked the beginning of a new era in the modern, global world. The beginnings of the United Nations brought with it the start of a combined global effort to increase economic and political stability with the hope to better the lives of people around the world (Whigam & Acker, 2003). Many may recognize these efforts as “globalization”, as - the increasing interdependence of economies became more interdependent on each other for

trade coupled with an overall increase of global interconnectedness in people, business, and government (Robinson, 2018; Kolb, 2019). Globalization has impacted virtually every industry in the world today, including agricultural industries. Whigam and Acker (2003) expressed that globalization in agriculture was and is necessary to solve global food security and environmental concerns. Because of this, students in colleges of agriculture need to be prepared to think from perspectives different from their own and work seamlessly across culturally diverse groups.

As the world population continues to increase, it becomes a challenge to produce enough food in sustainable, modern agricultural practices (Amundson et. al., 2015). However, producing enough food is not the only challenge. Additional challenge exists in ensuring that under-resourced populations have access to this food (FAO, 2020). Considering the population of hungry and malnourished people across the world, agriculture needs a workforce that has the appropriate experience and education to take on these complex issues. This expansion requires agricultural students to possess a variety of different skills. This therefore creates diverse job opportunities in agriculture that the industry needs globally-competent graduates to fill. Between 2015 and 2020, only 61% of the available jobs in agriculture, food, natural resources, and the environment will be filled by agricultural graduates, with the remaining jobs going unfilled or to students of different disciplines (Goecker, 2015).

It is likely that if agriculture graduates begin careers in the U.S., they will be working across cultures from around the world at some point due to the increase of multi-national corporations (Scott, 2015). Agriculture employers are recognizing this and are working to create environments full of diverse experiences and perspectives to ensure they have a team that will be comfortable working across cultures (AgCareers.com, 2018). Therefore, it is imperative that universities and colleges of agriculture equip their students with these important skills. Employers

agree that there is a need for agriculture graduates skilled in working well with others with different backgrounds or experiences (Crawford et al, 2011).

The question then becomes, are graduates from colleges of agriculture prepared for this type of work environment? It is well established that employers are looking for specific skills in recent graduates (Crawford et al., 2011; Morgan, 2012; Crawford & Fink, 2020.). Some of these skills, such as self-management, leadership, communication, working in teams, and problem-solving are regularly highlighted by employers (Crawford et al., 2011; Morgan, 2012). However, these are also the skills often cited as lacking in new graduates (Crawford & Fink, 2020). Compounding this issue, students may be even less capable of effectively utilizing these skills in unfamiliar environments different than those with which they are familiar. Colleges of agriculture have begun preparing their students for these essential skills, combined with an awareness of the ever-increasing globalization. As a result, student involvement in study abroad as well as on-campus intercultural learning experiences has increased substantially.

1.3 Intercultural Competence

1.3.1 What is intercultural competence?

There is no general consensus on the definition of intercultural competence. Intercultural competence itself can take on a variety names, such as cultural communicative competence, cultural competence, globally minded, among others and it is difficult to find a concrete definition that is rooted in the literature (Deardorff, 2011). However, one study by Deardorff (2006) was the first paper to document a consensus for a definition of intercultural competence. Deardorff (2006) reported that there are elements of intercultural competence that scholars and administrators agreed on and that it is possible to assess degrees of intercultural competence. Items within the dimensions

of intercultural competence can be broken down into more measurable aspects, but an overall definition for intercultural competence is “effective and appropriate behavior and communication in intercultural situations.” (Deardorff, 2011).

To have a more complete view of intercultural competence, some groups have offered definitions from a heuristic viewpoint (Spitzberg and Changnon, 2009). By looking at the conceptualization of both the terms *intercultural* and *competence* separately we can better understand how the two work together. When models of intercultural competence are given, they often account for items like adjustment, assimilation, and adaptation, all of which are often equated with competence. *Adjustment* refers to a normalization process and how well one can overcome “culture shock”. *Assimilation* represents how well someone becomes similar to the host culture. *Adaptation* showing how well someone can change their ways or mannerisms to mimic the host culture’s ways and mannerisms (Spitzberg and Changnon, 2009). Therefore, while competence can vary depending on the context, it is important to consider all conceptualizations of the word to account for the levels of cross-cultural interactions in an effective and appropriate way (Spitzberg and Changnon, 2009). When discussing the definition of *intercultural*, we must first look at culture, which is an evolving theoretical term that describes things such as shared attitudes, beliefs, customs, and behavioral patterns among groups of individuals. Thus, when we combine these terms into intercultural competence, a more complete definition becomes “the appropriate and effective management of interaction between people who, to some degree or another, represent different or divergent affective, cognitive, and behavioral orientations to the world” (Spitzberg and Changnon, 2009). For the purpose of this thesis, intercultural competence will be described using this definition from Spitzberg and Changon (2009).

Deardorff (2006) reported that administrators preferred a more general definition of intercultural competence, and often institutions developed their own working definitions. However, several institutional definitions showed similarities in what was included. The four most common elements were: awareness, valuing and understanding of cultural differences, experiencing other cultures, and self-awareness of one's own culture (Deardorff, 2006). Intercultural scholars identified additional aspects of the definition which included personal attributes such as curiosity, openness, respect for others, and cultural knowledge about oneself and others. Other specific skills, such as the ability to analyze, relate, observe, listen, and cognitive skills emerged as well. While there was still variance among scholars, it was determined that a single component is not enough to assess intercultural competence (Deardorff, 2006).

As mentioned in the Process Model of Intercultural Competence (Deardorff, 2006; 2009), it is perhaps more important to develop intercultural skills opposed to only intercultural knowledge. This model states that intercultural competence is a developmental process. Critical thinking skills are necessary to acquire intercultural skills and attitudes such as curiosity and openness are the base that people must start with to build any further intercultural skill (Deardorff, 2006). This may vary some, but the one thing that many intercultural specialists agree on is that the ability to understand different worldviews is an important consideration when discussing intercultural competence (Deardorff, 2009).

Using this knowledge and following the definition of intercultural competence proposed by Bennett (2008) as “a set of cognitive, affective, and behavioral skills and characteristics that support effective and appropriate interaction in a variety of cultural contexts”, the American Association of College and Universities (AAC&U) developed the Intercultural Knowledge and Competence (IKC) VALUE Rubric that outlines key skills, knowledge, and attitudes associated

with intercultural competence. The levels represented on the IKC VALUE Rubric are guided in part by both Deardorff's (2006) work on intercultural competence and Bennett's Developmental Model of Intercultural Sensitivity (AAC&U, 2009). This rubric contains six key components of intercultural competence (cultural self-awareness, knowledge of worldview frameworks, empathy, verbal and nonverbal communication, openness, and curiosity) and addresses the level a person operates for each one (AAC&U, 2009).

1.3.2 Assessing Intercultural Competence

Bennett was first credited with the development of the Developmental Model of Intercultural Sensitivity (DMIS), which provided a way to explain how people interacted and engaged with different cultures. The DMIS as a theory functions as a continuum that ranges from ethnocentrism to ethnorelativism (Bennett, 2014). Ethnocentrism is the idea that experiences of one's own culture are at the center of reality while ethnorelativism is when one's experience with different cultures are relative to individual contexts (Bennett, 2014). The Intercultural Development Inventory (IDI) was created based on the DMIS model as a cross-culturally validated assessment that measures levels of intercultural competence (IDI, 2020). Information gained from the IDI provides each individual a numerical value of 55 to 145 that can be used to place the person along a continuum called the Intercultural Development Continuum (IDC; Hammer, 2011). The IDC identifies specific stages to describe an individual's or a group's orientation along the continuum. Five stages are identified and range from a monocultural mindset (*denial* and *polarization*) to a more intercultural mindset (*acceptance* and *adaptation*) with a bridge between the two in the middle (*minimization*; IDI, 2020). Each of these stages have unique qualities with definitions from Hammer (2012).

- Denial is an orientation in which individuals do not recognize cultural differences and often show a lack of interest in interacting with or learning about other cultural groups. Those with an orientation of denial often have limited interaction with other cultures so operate with basic stereotypes and generalization of other cultures.
- Polarization is an orientation that can often takes on a more judgmental mindset where individuals recognize cultural difference but then view those differences as “us” versus “them”. Polarization can either take on the form of defense (my culture is superior) or reversal (their culture is better).
- Minimization is an orientation that serves as a bridge from monocultural mindset to intercultural mindsets. Those in minimization often recognize differences but choose to put them aside and instead focus on the similarities across cultures.
- Acceptance is an orientation where individuals can recognize and appreciate cultural differences. Individuals in this orientation tend to feel curious about different cultures and understand different cultural patterns or behaviors.
- Adaptation is an orientation in which individuals can recognize and appreciate cultural difference, and they are able to adapt their own cultural perspectives. This means that those in adaptation are able to bridge across cultural differences and change their own behavior in culturally appropriate ways.

When individuals complete the IDI, they are given both a numerical score and the stage they fall within on the IDC. In addition to these two pieces of information, each person is also given an Intercultural Development Plan (IDP). This IDP serves as a guide to help individuals better understand their orientation on the IDI and provide reflection questions and suggestions for

activities they can complete to help them grow in their level of intercultural competence (IDI, 2020).

While the IDI serves as a way to quantitatively measure intercultural competence, the IKC VALUE Rubric provides a measure to assess intercultural competence qualitatively. The rubric outlines six key components that scholars agree are important to intercultural competence (AAC&U, 2009). Each of these components are placed in a rubric where they can be ranked on either a level 1 (benchmark), a level 2 or 3 (milestones) or a level 4 (capstone). Of these six components, two are knowledge (knowledge of cultural world-view frameworks and cultural self-awareness), two are skills (empathy and verbal and non-verbal communication) and two are attitudes (curiosity and openness). All of the following definitions are describing each component at its capstone level (level 4) (AAC&U, 2009).

- Cultural self-awareness: the ability of an individual to articulate insights about their own culture including their rules and biases
- Knowledge of cultural worldview frameworks: the ability of an individual to exhibit a sophisticated understanding about the complex elements in other cultures.
- Empathy: ability of an individual to interpret an intercultural experience from a perspective outside of their own and act supportive in a way that recognizes the feelings of other cultural groups.
- Verbal and non-verbal communication: ability of an individual to show an understanding of cultural differences about communication and ability to negotiate an understanding based on those differences.
- Curiosity: an individual seeks answers to complex questions about other cultures and can answer those questions in a way that reflects other cultural perspectives.

- Openness: an individual wants to interact with culturally different others, while suspending judgment and valuing those interactions

1.3.3 Methods of Teaching Intercultural Competence

Historically, universities have used international programming, like study abroad, as a way to develop undergraduate intercultural competence (Vande Berg & Paige, 2009). However, there are challenges to relying on international experiences to increase intercultural competence today. Popularity of short-term study abroad has increased among U.S. undergraduates in recent years, providing more students with the opportunity to develop these intercultural skills but still, only around 10% of undergraduates will participate in an international experience during their academic career (USA Study Abroad, 2018; NAFSA, 2020). At the time of writing, the global COVID-19 pandemic has further limited opportunity for students to travel internationally. These challenges amplify the need to incorporate intercultural learning into on-campus platforms so that more students have the access to practice and develop these skills.

With the increase in students going on short-term study abroad trips, an increase in globally competent students would be expected, but that is not necessarily the case. Although there are many skills students can develop from study abroad programs, going abroad does not automatically equate to an increase in intercultural skills (Deardorff, 2009; Behrnd & Porzelt, 2012; Rice et al., 2014). There are inconsistent results in the literature on the impact short-term study abroad has on intercultural competence, but a general agreement can be found around the benefit of including deliberate intercultural interventions in study abroad programs. In recent years, several studies have reported various ways to increase intercultural competency through both international and on-campus programming (Feng, 2016; Krishnan et al., 2017; Snodgrass et al., 2018).

Using on-campus course in a college of agriculture focused on communicating across cultures as a platform, Snodgrass et al. (2018) examined the impact of a flipped design course that used student-centered teaching and a variety of different teaching methods on observed changes documented in intercultural competence. Throughout the semester-long course, students participated in lecture discussions and hands-on activities with their peers. In addition to the on-campus portion, participants completed guided service-learning projects that were designed to help students learn about diversity. All of these pedagogy methods were designed to help students develop intercultural competence. At the end of the course, IDI results from students enrolled in the course indicated significant development of intercultural competence (Snodgrass et al., 2018).

A similar study reported growth in intercultural competence in students completing both in- and out-of-classroom experiences designed to promote intercultural development (Feng, 2016). This study specifically focused on reflective and critical thinking skills and researcher-implemented interactive activities to allow students to practice those skills several times throughout the course. Following these reflective interventions, students improved in areas such as interpersonal communication, understanding cross-cultural contexts, open-mindedness, and awareness of their surroundings. The results from this study and from Snodgrass et al. (2018) suggest that deliberate reflective activities can promote intercultural competence in on-campus courses.

Several studies have examined the impact of study abroad on intercultural competence with and without intentional interventions. Programs without intentional interventions often results in less intercultural growth among undergraduates compared to those that included interventions (Fabregas-Janeiro et al., 2011; Nguyen, 2017). This suggests that opportunities exist to integrate deliberate reflections and activities in study abroad programs to promote intercultural competence.

Krishnan et al. (2017) observed changes in intercultural competence among students who completed a short-term study abroad program in addition to an on-campus course before the international experience. Students completing the on-campus intercultural interventions and the study abroad portion showed significantly more growth on the IDI than those students who participated in the international experience but did not complete the intercultural interventions during pre- or post- departure (Krishnan et al., 2017). In another study, Grant & Karcher (2019) reported significant growth in intercultural competence among students completing a short-term study abroad as a part of a semester-long course. Students completed assignments and reflections designed to increase certain intercultural skills such as cultural self-awareness and awareness of others and on average such students increased over 13 points on the IDI (Grant & Karcher, 2019). Each of these examples show that study abroad can be used as a tool to develop student intercultural competence, but specific interventions before or during the international experience may be needed.

1.4 The Overlap of Essential Skills and Intercultural Skills

1.4.1 Gap in Literature

Many comparisons can be drawn between intercultural and essential skills, but there is a gap in literature when it comes to documenting any correlation between the two if such a correlation exists. Both essential and intercultural skills are important for agriculture graduates to succeed in their careers. Specifically, there is also a gap in literature surrounding empathy development in colleges of agriculture. The majority of literature focusing on empathy is in the medical field, but empathy is also an important skill for students planning careers in the agricultural industry as it is a global industry that will require students to work with diverse groups of people.

Universities are recognizing the importance of integrating intercultural learning into their courses and if a correlation between essential and intercultural skills can be seen documented, between both skillsets, this may provide further support as to why it is necessary to integrate into undergraduate curricula.

1.4.2 Essential Skills

Recently, a consensus among agriculture employers demonstrated a gap in several skills employers believe are important compared with priorities of agriculture graduates regularly define gaps in skills important to employers and skills developed and prioritized by universities and their students. Crawford and Fink (2020) reported that colleges and universities are taking steps to decrease this skill gap and have made progress on several skills. However, there are still a few skills absent in recent graduates entering into the workforce. These skills are considered growth areas and employers, alumni, faculty, and students are in agreement on the fact that there is a significant gap in graduates' preparedness with these skills. These growth areas include skills related to: communication, decision making and problem solving, self-management, teamwork, professionalism, experiences and leadership. (Crawford & Fink, 2020). Both a 2011 study (Crawford et al.) and a 2020 study (Crawford & Fink) focused on an essential job skills report that graduates are lacking in several clusters of essential job skills and need these skills to be equipped to work in a diverse workplace. Previous studies specific to the agriculture industry supported the claim that there are specific essential skills that agricultural graduates should have to be effective in the workplace (Morgan & Rucker, 2013; Easterly et al., 2017).

When discussing the importance of essential skills, it is also important to recognize the connection they have to intercultural skills. As mentioned previously, the IKC VALUE Rubric provides a set of skills, attitudes, and knowledge that can be used to assess intercultural

competency (AAC&U, 2009). This rubric identifies key areas of intercultural competence and, through their definitions, several similarities can be seen with essential skills. Communication, for example, is seen as a necessary skill and may influence student's ability to utilize other intercultural skills (AAC&U, 2009). The rubric highlights verbal and non-verbal communication skills similar to others that described communication as an essential skill (Crawford & Fink, 2020). Communication is the only specific skill that is listed in both areas (essential and intercultural skills) but when evaluating the constructs and definitions, other similarities are apparent.

Two attitudes listed on the IKC VALUE Rubric are curiosity and openness. Both of these attitudes focus around having an open mind to other perspectives and being curious about other cultures (AAC&U, 2009). These attitudes can influence a variety of a person's essential skills such as teamwork, professionalism, and leadership. All three of those cluster skill areas require a person to be able to work with those different than them, respond in a professional manner, and lead a team of diverse people if their job calls for it. This is just one other example of how intercultural skills and essential skills are related and why it may be necessary to focus on specific skills as well. Observing intercultural skills broadly is important to determine a person's level of intercultural competence, but it is also important to identify and develop specific intercultural skills. Doing this allows specific aspects of intercultural competence to be targeted which can provide more opportunity to highlight specific skills that employers want in their employees.

1.4.3 Empathy

One of the specific skills that can be targeted for ?? is empathy. Empathy is described an intercultural skill, but it also has potential to be useful in the development of essential skills. Having an increased level of empathy could make someone a better team player if they are willing to see things from more than one perspective and help with their communication skills in terms of

listening to others and communicating professionally. According to the IKC VALUE Rubric, empathy is described as the ability to view the experiences of others from more than one worldview and to recognize different cultural perspectives in a supporting way (AAC&U, 2009). For the purpose of this thesis, we will use the IKC rubric as our method of assessing empathy qualitatively.

Empathy is a specific skill that can be developed with targeted, deliberate interventions in a classroom setting (Batt-Rawden et al., 2013; Levett-Jones et. al., 2019). Empathy can be developed using experiential learning methods such as role playing and reflective writing (Lee et al., 2018). However, much of what is known about developing empathy is found in the medical field where empathy is considered a key aspect for practicing medicine. In a systematic review of teaching empathy to medical students, a general consensus was found surrounding the importance of using experiential interventions and reporting long-term data to track the effectiveness of the interventions. There are several different interventions that led to an increase of empathy in medical students including, creative arts, writing, role-playing, interviews, and interprofessional skills trainings, showing that empathy can be developed using a variety of methods (Batt-Rawden et al., 2013).

So why is it important to consider empathy in the field of agriculture? As previously stated, agriculture is becoming increasingly globalized, which most workforces are composed of very diverse perspectives (Whigam & Acker, 2003; Robinson, 2018). Furthermore, Hendricks and Drysdale (2015) describe empathy as necessary in agriculture because the majority of the world's poor work in agriculture. Agriculture plays a key role in the livelihoods of so many that face food security and hunger and agricultural students should be able to empathize with those issues as they enter a globalized agriculture industry (Hendricks & Drysdale, 2015), work with people from different cultures throughout their careers, and navigate perspectives different from their own.

1.5 Conclusion

With the global nature of today's agricultural industry, graduates from colleges of agriculture must possess a variety of intercultural and essential job skills. This thesis addresses methods and results observed when implementing intercultural activities into an introductory animal agriculture course and a short-term study abroad program followed by a semester long, on-campus course focused on international agriculture topics (Produzionii Animali: Exploring Animal Production in Italy). Each study used a variety of intercultural interventions with a focus on overall intercultural competence development and the specific intercultural skill of empathy. By developing intercultural competence, it is also a possibility to increase student's essential job skills. Therefore, I created a scale to measure student's self-reported level of essential skills as a first step in future research to search for correlations between intercultural and essential skills. Based upon skills that agricultural employers want in their new hires and intercultural competence development presented in this literature review, these studies seek to add support to existing literature about adding intercultural competence teaching strategies into already established agricultural course curriculum.

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CHAPTER 2. CULTIVATING EMPATHY: DEVELOPING STUDENT INTERCULTURAL SKILLS IN AN INTERNATIONALLY FOCUSED ANIMAL SCIENCE COURSE

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J. Wickenhauser and E.L. Karcher

2.1 Abstract

A diversifying agricultural workforce has increased the need for college graduates who have the skills necessary to thrive in a global industry. Employers are searching for graduates with developed intercultural competence, including empathy, to work successfully within a diverse workforce. Study abroad programming is one strategy to promote development of these skills. Our study explored and described the growth of student intercultural competence and empathy development before and after participation in a combined learning community-study abroad program. In July 2019, 9 students completed a short-term program to study animal production in Italy with a follow-up 16-week on-campus course. Students participated in written reflective activities throughout the program. The Intercultural Development Inventory and Intercultural Knowledge and Competence VALUE rubric were used to measure general intercultural growth and empathy development. Although, there were no changes in overall group intercultural development, the majority of students ($n=5$; 55.6%), progressed meaningfully on the Intercultural Development Continuum. Qualitative analysis of written responses to empathy prompts revealed an increase in students' demonstration of empathy as the semester progressed. Our results support the use of deliberate intercultural interventions in international programming to impact development of both student intercultural competence and empathy.

Keywords: agriculture, empathy, intercultural competence, learning community, study abroad

2.2 Introduction

There is a growing demand for college graduates with expertise in agriculture, food, and natural resources (Goecker et al., 2015). As agriculture continues to be globalized by practices such as foreign trade (Smith et al., 2010), an increasingly diverse agriculture workforce is expected. The U.S. livestock sector is expected to continue grow in coming years and an increase in foreign trade is expected in the livestock sector as well (USDA, 2020). This highlights the need for animal science students to possess the skills to navigate global settings even if they stay in a domestic based job throughout their career. Employers recognize this and are specifically recruiting candidates with diverse experiences and perspectives to build a more globally minded workplace (Agcareers.com, 2018). Therefore, college graduates need to possess skills to thrive in this type of environment. Employers in the agricultural industries identified communication, self-management, and teamwork as critical essential skills needed to be successful in the workplace (Crawford et. al., 2011). However, undergraduate agricultural programs have often focused on technical skill development and not on development of these interpersonal skills (Crawford et al., 2011; Morgan, 2012). This discrepancy in training highlights the need for incorporating essential skill development in undergraduate curriculum.

The development of essential skills is closely related with the development of intercultural skills. This includes cultural self-awareness, knowledge of worldview frameworks, empathy, verbal and nonverbal communication, curiosity, and openness (AAC&U, 2009). These skills align with clusters of essential skills identified by employers as critical for employee success (Crawford et al., 2011). For example, the ability to communicate and work successfully on a team are two skills sought after by employers. The ability to communicate includes the capacity to listen effectively, communicate accurately and concisely, and ask relevant questions, while teamwork includes being a productive member of a team and being aware and sensitive to diversity

(Crawford et. al., 2011). As students are provided with opportunities to develop intercultural competence, such as better knowledge of worldview frameworks, their appreciation for other points of view is expected to grow and will increase students' abilities to navigate teamwork and conflicts. Therefore, incorporating activities to develop intercultural competence in agricultural undergraduate curricula is one opportunity to develop future workers who are ready to navigate diverse work settings.

International experiences, such as study abroad programming, are opportunities for universities to prepare students for a diverse workplace and can also foster the development of intercultural competence. Study abroad has become more popular in recent years with the number of U.S. undergraduates participating increasing by 2.7% in the 2017-2018 academic year (NAFSA, 2017; USA Study Abroad, 2018). Although study abroad provides the opportunity for undergraduates to develop a number of skills, participation does not automatically equate to increased intercultural development (Behrnd & Porzelt, 2012; Rice et al., 2014). Hansen (2010) discovered that there was no difference in global thinking among undergraduates who studied abroad with no embedded intercultural learning, students who completed a semester long multicultural class, or students who completed neither. In a study by Fabregas-Janeiro et al. (2011), there was no significant change in intercultural competence between students who participated in a short-term faculty-led study abroad and students who completed a semester-long intercultural course.

However, the introduction of targeted intercultural learning experiences within a program has been linked to increased gains in intercultural competence development. Nguyen (2017) included student reflection journals, connections with local residents, and exploration of new areas of the culture into a study abroad program and reported increases in intercultural competency. A

short-term study abroad program resulted in greater student intercultural competence development compared with students who did not receive any intercultural interventions (Krishnan et al., 2017). These studies support the need to provide students with deliberate intercultural activities and reflections in order to maximize the benefits of the international experience.

In addition to general intercultural development, it is also possible to develop specific skills, like empathy, with international activities within an undergraduate curriculum (Batt-Rawden et al., 2013; Levett-Jones et. al., 2019). At a capstone level of intercultural skill, empathy is described as the ability to view the experiences of others from more than one worldview and to recognize different cultural perspectives in a supporting way (AAC&U, 2009). This level of empathy aligns closely with the essential skill description of teamwork, which includes positive and encouraging attitude and awareness and sensitivity to diversity (Crawford et al., 2011). Developing empathy in undergraduate curricula is essential to increasing awareness and support for others, both characteristics sought after by employers. The importance of developing empathy is found frequently in the medical literature, where empathy is considered an important key aspect in practicing medicine (Batt-Rawden et al., 2013). Experiential interventions, including role-play and reflective writing, are linked to improved empathy in undergraduate nursing students (Bas-Sarmiento et al., 2017; Lee et al., 2018).

Similar to our study, Lee et al (2018) sought to develop empathy in second-year undergraduate students in a classroom setting by implementing a 16-week teaching program with nursing students based on experiential learning. Students in the course who received classroom-based role play, self-reflection, situated learning, and acting, experienced greater development of empathy compared with peers in the course who did not receive these activities (Lee et al., 2018).

This further supports the use of several reflections, and experiential activities we used in the present study to target the development of empathy.

2.3 Purpose and Objectives

Based on the importance of developing intercultural skills in international programming, the goal of our study was to explore and describe intercultural competence and empathy development before and after participation in an animal science combined learning community and study abroad program. Our paper discusses the results of measuring students' empathy development during a short-term international experience and participation in a semester long learning community course. Combining two high impact practices, study abroad and a learning community, provides students multiple opportunities to develop intercultural competence and prepares them for careers in a diverse workforce.

2.4 Methods

2.4.1 Course Information

A combined learning community and study abroad course was created for a large Midwestern land-grant university. Nine undergraduate students enrolled in a 10-day study abroad trip to Italy to study animal production in July 2019 and a follow-up 16-week, on-campus course in the fall of 2019. The participants were all second-year agriculture students. The on-campus portion of the program met once a week for 50 minutes and included lectures from agriculture professionals about their international experiences and projects. Intercultural learning assignments, designed to develop student intercultural competence and empathy, were embedded throughout the program (Table 2.1). During the semester, students also completed service projects,

professional development activities, and social activities outside of the class. The Institutional Review Board at Purdue University approved all methods (IRB-2019-13).

Table 2.1 Description of the course activities and week administered to nine students enrolled in a 10-day study abroad program and 16-week on-campus learning community course focused on international agriculture.

Assignment	Week	Activity
1	1	IDI Debrief #1 (based on IDP)
2	3	"Who I am" Poem
3	6	Alpha/Beta Assignment
4	8	IDI Debrief #2 (based on IDP)
5	11	Visit a Culturally Different Business
6	13	Danger of a Single Story
7	15	IDI Debrief #3 (based on IDP)

2.4.2 Student Demographics

All nine students enrolled in the course were second year students in the college of agriculture.

2.4.3 Intercultural Competence Assessment

Overall, intercultural competence was assessed using the Intercultural Development Inventory (IDI). The IDI is a 50-item online questionnaire that is validated to assess intercultural competence in our undergraduate student population (Hammer, 2011). The quantified results of the IDI are a measure of intercultural sensitivity and are reported as numbers on the Intercultural Development Continuum (IDC). The numbers correspond to an individual or group's Developmental Orientation (DO). The DO signifies the objective stage from which the participant

operates when encountering cultural difference and is associated with one of the 5 developmental stages on the IDC: *denial* (55-70), *polarization* (71-85), *minimization* (86-115), *acceptance* (116-130), and *adaptation* (131-145) (Hammer, 2012).

Throughout the program, students completed the IDI three times: one-week prior to international travel (T1), and weeks 1 (T2) and 15 (T3) of the companion course during the Fall semester. We selected three time points for IDI assessment in order to distinguish development immediately following the international experience and development during the on-campus course. Time point selections were consistent with others who used the IDI pre and post intervention to measure student change throughout the program (Sandell & Tupy, 2015; Krishnan et al., 2017; Snodgrass et al., 2018). With our present study including an international course and on-campus course we selected three time points to see the effect of both courses.

2.4.4 Intercultural Interventions

Intercultural assignments were selected based on the group's average stage of intercultural development, *minimization*, and assignments that specifically promoted empathy development (HubICL, 2020). During the international component of the course, students completed guided reflections, discussions, and daily debrief sessions (Table 2.1). For the semester-long class, students completed four intercultural activities followed by related reflective written assignments, as it has been found that engaging in reflective activities is important for IC growth and can deepen the impact of the material on student learning (Wilbur, 2016). Weekly class discussions were combined with the out-of-class assignments to maximize opportunities for the students to reflect. All written reflections were returned within one week of the submission date and students were provided individual comments.

In addition to the intercultural assignments, each student completed an Intercultural Development Plan (IDP) that was included with the results of each IDI. Students received their IDP after completion of the IDI at timepoint T1. Using the IDP as a guide, we created three reflective assignments and assigned each one at weeks 1, 8, or 14 of the semester. The IDP and associated assignments provided students with opportunities to reflect and develop intercultural competence throughout the semester. The first assignment of the fall semester challenged students to use their individualized IDP to formulate two goals they could complete by the end of the semester. Students then followed up on their progress with guided reflection assignments in the middle and end of the semester.

2.4.5 Empathy Assessment

Empathy development was assessed by using students' written reflection assignments throughout the semester. These assignments were given approximately every two weeks allowing us to view the progression of empathy throughout the course. Six of the seven written assignments throughout the semester were used to evaluate empathy development. The second IDP Debrief plan assignment (week 8) was not used in the assessment because this assignment was focused more on student self-reported progression towards their own personal IDP goals and did not include specific prompts related to empathy. Each assignment included three to four prompts for students to reflect and respond to and one prompt was chosen from each of the six assignments to assess empathy. The six prompts chosen to be evaluated for empathy were selected because they were designed to stimulate students to reflect on their own experiences and encourage students to consider cultural differences from more than just their own perspective (Table 2.2).

Deductive coding was selected because this method is a narrower approach than inductive coding and allowed us to identify established theoretical frameworks that already exist in literature

(Linneberg & Korsgaard, 2019). Magnitude coding allows the addition of a supplemental code to show intensity, frequency, or different levels of the already coded item (Miles et. al., 2014; Weston et. al., 2001). We used the Intercultural Knowledge and Competence (IKC) VALUE Rubric (AAC&U, 2009) to code student responses from each of the prompts into one of four levels, ranging from benchmark to capstone level. By utilizing deductive coding in addition to magnitude coding, we were able to place students in categories based off of the different benchmark levels (1-4) given on the IKC VALUE Rubric (Miles et al., 2014; Weston et al., 2001).

Table 2.2 *Description of the prompts students responded to in six written reflective assignments.*

Assignment	Prompt #	Prompt
1	1	In your own words, describe the meaning of empathy. Describe a time you were empathetic to someone who was different from you.
2	2	What insights or conclusions come to mind about your overall experience with people who are culturally different from you?
3	3	What do you think culture is and how does it affect a person's behavior?
5	4	Describe what took place and how you felt during the negotiation with the other culture (in reference to the Alpha/Beta assignment completed in class).
6	5	Select one quote from the speech and share a reflection as to why this quote resonated with you (in reference to a TED Talk about single stories).
7	7	How can this new information change your perception, interpretations, judgements, reactions, and/or behaviors in the future?

2.4.6 Statistical Analysis

Data on the group's intercultural competence, collected from the IDI, was analyzed using IBM SPSS Version 26. Paired t-tests were conducted to look for group differences in means from IDI results from T1 to T3. Means and standard error were analyzed and statistical significance was declared at $p > 0.05$.

2.5 Results

2.5.1 Group and Individual Developmental Orientation

There was limited progression of the group DO across the three time points (91.03, 93.72, and 96.87 at T1, T2, and T3, respectively). At T1, 78.0% (n=7) of students were in *minimization* and 22.0% (n=2) were in *denial*. This shifted at T2 with 56% (n=5) being in *minimization*, 22.0% (n=2) regressing to *polarization*, 11.0% (n=1) remaining in *denial* and 11.0% (n=1) progressing to *acceptance*. By T3, the majority of the group remained in *minimization* (56.0%), with 22.0% progressing to *acceptance*, 11.0% staying in *denial*, and 11.0% regressing to *polarization*. While there were individual changes observed in students throughout the course, the group largely remained in *minimization* at T1, T2, and T3.

In addition to group-level changes, we also evaluated individual development. Of the nine students, 55.6% (n=5) progressed meaningfully (moved forward more 7 points or more) (Hammer, 2020) in their DO from T1 to T3 (Table 2.3). Three students (33.3%) remained neutral, while 11.1% (n=1) decreased meaningfully. Two of the nine students that progressed between T1 and T3, progressed over 14 points. This is twice the amount identified as meaningful by the IDI (2020).

Of the program participants, 44.4% moved to a new stage on the IDC between T1 and T3. Two students (n=22.2%) moved from *minimization* into *acceptance*. These students transitioned

from a monocultural to an intercultural mindset where instead of minimizing differences, they were able to appreciate those differences (Hammer, 2012). As mentioned, it is possible to regress on the IDC. One student (n = 11.1%) regressed from *minimization* to *polarization* between T1 and T3. (Table 2.3).

Table 2.3 *Percentages of the 9 undergraduate participants composing each development stage on the Intercultural Development Continuum from pre (T1) to post (T3) program.*

Stage	T1 (%)	n	T3 (%)	n
Denial	22.2	2	11.1	1
Polarization	0.0	0	11.1	1
Minimization	77.8	7	55.6	5
Acceptance	0	0	22.2	2
Adaptation	0.0	0	0.0	0

2.5.2 Empathy Development

During the first week of the semester, 44.5% (n=4) of students provided responses to written reflective prompts that aligned with level 1 on the Empathy on the IKC VALUE rubric (AAC&U, 2009) (Table 2.4). At this benchmark level, students often only view the experience of other's through their own points of view. Four students (44.5%) aligned with a level 2 the first week, providing responses that aligned with their ability to identify components of different cultural perspectives, but still responding according to their own worldview. As the semester continued, a transition was observed as students' written responses to prompts indicated empathy development. Although only 11.0% (n=1) of students started the semester at a level 3, 44.5% (n=4) completed the last assignment with statements that indicated they were recognizing intellectual and cultural difference and responding in a worldview different than their own. No student on our program provided a written response that was indicative of a level 4.

Selected representative quotes are presented underneath each level of empathy development related to student written reflections in response to multiple prompts provided throughout the program. These quotes provide examples of student progressions across the three levels of empathy observed in our study.

Level 1. At this level students often use “me” statements and even though they try to connect emotionally or view someone else’s experience, they relate it back to themselves and how they would feel or how they could help. Students in level 1 often times assume they know and understand the feelings of others.

Thankfully I have never been faced with the same discrimination as my friend had experienced. However, I could only imagine how horrible it is to be judged on something so irrelevant and that makes no difference on what kind of person one is.

Who you grow up with changes and shapes how you react to things and your behavior. People of the same culture tend to stick together because it’s what is familiar to them and comfortable.

It was hard for me to understand why they couldn’t see the way our points and values made more sense logically and in the business profession compared to their preference to following cultural family values.

Level 2. Students in level 2 can recognize when someone culturally different than them is reacting in a certain way due to those differences, but they still use frequent “me” statements and revert back to how they can help or assuming they understand how the other person feels.

I empathize with him because I understand the stress of the work environment and the feeling of not always being understood. I always take care to be polite to him and let him take his time so he doesn’t feel stressed as often. Even though he comes from a dissimilar culture, I don’t think he should feel any differently or be treated separate of my other coworkers.

A lot of times it seems that the differences stem from variations in geographical location, resources available, or the history coming from others who lived in that same area. It is easier for me to realize that the cultures and ethnicities people possess are typically something they cannot help, as many times they were born into their beliefs. Even if they do choose to possess certain differences, everyone deserves to be happy, and incorrectly judging others based on their choices of happiness is something that should not be tolerated.

Walking around campus where it is diverse with people of all different race, religion, and background, you realize how little it is embraced. We still have our cliques. You notice that the white, black, Asian, they all stay within their groups. It is true that international students have little American friends and rather lean towards other international students. I found this was because of the little we have in common; they find it hard to approach us. I can agree if the roles were reversed, I'd try to find familiarity or stick to myself.

Level 3. Students expressing a level 3 in our program often showed that they could recognize these differences and were using fewer “me” statements in their responses. Their responses demonstrated that they understood why some of these differences were there and showed progress in recognizing their own biases when it comes to culture.

A time I was empathetic to someone who was different from me was when I processed and really understood the fear that one of my African American friends had towards police. It really hadn't occurred to me the level of fear that she faced on a daily basis until I sat down and spoke to her about it...Once she explained it, I was really able to understand and put myself in those situations she had been in with police to realize the fear.

Being comfortable in your own culture can allow you to appreciate and better understand other cultures with an open mind. It is important to be able to recognize that people come from different cultural backgrounds and knowing this can change how people act towards people who are different from them.

This resonated with me because of single stories and it can cause people to see others just as one way and not see them as anything else. Stories can cause stereotypes and labels that can be true, false, or even hurtful. It made me reflect on my life and the stereotypes I have of other people and how that makes me perceive

them differently. I need to look at the full picture of someone and not base people off of a single story.

Table 2.4 *Progression of empathy development of the nine undergraduate student participants responding to prompts with written reflections. The level of empathy was determined by coding the number of student responses that aligned with one of four levels using the AAC&U IKC VALUE Rubric.*

Prompt	% of level 1 empathy	% of level 2 empathy	% of level 3 empathy	% of level 4 empathy
1	44.5	44.5	11.0	0.0
2	44.5	33.3	22.2	0.0
3	11.1	77.8	11.1	0.0
4	33.3	55.6	11.1	0.0
5	22.2	44.5	33.3	0.0
6	11	44.5	44.5	0.0

2.6 Discussion

The development of intercultural competence in undergraduates is important as it allows students the opportunity to begin to think using a more global mindset and provides them the opportunity to practice essential skills employers seek. The majority of undergraduate students operate in *polarization* or *minimization* on the IDC (Sandell & Tupy, 2015; Snodgrass et al., 2018). This was observed in our study with 77.8% of students experiencing *minimization* at the start of the program. Students in this range often function in a monocultural mindset or are beginning to transition into the early stages of an intercultural mindset. Although the majority of students in our course remained in minimization, two students transitioned during the program from *minimization* to *acceptance* and one student from *denial* to *minimization*. These results provide further support to the claim that intentional opportunities, similar to the one offered in our course, are needed in

college curricula for students to practice and develop the intercultural skills they will need to be successful in a future workforce (Snodgrass et al., 2018; Wiersma-Mosley, 2019)

Study abroad programming creates experiences for students to experience cultures different than their own. Intercultural competence can be developed during these programs, but simply participating in the international experience does not always equate to intercultural growth (Behrnd & Porzelt, 2012). However, implementing intentional intercultural activities in study abroad programming can have a positive impact on student intercultural growth (Krishnan et al., 2017; Nguyen, 2017).

Intercultural competence includes a range of different skills, knowledge, and attitudes including: cultural self-awareness, knowledge of worldview frameworks, empathy, verbal and non-verbal communication, curiosity, and openness (AACU&U, 2009). These skills are directly related to interpersonal essential skills, which are highly sought after by employees in the agriculture industries. Some of these essential skills include, but are not limited to, communication, critical-thinking, teamwork, problem solving, and leadership (Crawford et al., 2011; Easterly et al., 2017). While communication is the only skill explicitly listed in both intercultural and essential skills, there is an overlap between several of these skills. Empathy, for example, as an intercultural skill that provides students the ability to understand cultural differences and react in appropriate and supportive ways. Development of this skill also has the potential to foster leadership ability in our students by allowing them to appreciate differences seen between people. Teamwork is also impacted by empathy development because it provides students the skills to interact and understand those on the team that are different than themselves. The importance of undergraduates developing these skills are highlighted in studies by Morgan and Rucker (2013) and Easterly et al.

(2017), where both reported that communication skills and the ability to work in a team were found to be needed competencies for working in the agricultural industries.

While our course included a short-term study abroad at the beginning of the program, students continued to work on development of intercultural competence, specifically empathy, throughout the semester-long course that followed the international experience. Students in our study also participated in activities, such as classroom-based role play and self-reflection. We were able to document increased development of empathy in our students as they progressed through the semester's activities and experiences. Our study and Lee et al. (2018), demonstrate the importance of including deliberate activities to develop student empathy skills

The medical field is one discipline that places a high importance on the development of empathy in undergraduate students interested in future medical careers (Batt-Rawden et al., 2013; Fleming et al., 2015; Bas-Sarmiento et al., 2017; Levett-Jones et al., 2019). Many in this area of study consider empathy as an essential skill for those in jobs related to the medical profession (Batt-Rawden et al., 2013). We are beginning to observe the same trend in the agricultural field and a desire for our graduates to express empathy and other essential skills (Crawford et al., 2011, Easterly et al., 2017). We must begin to consider innovative ways to engage our undergraduate student body and provide them the support needed to develop these skills. Our study approached this need by combining an international study abroad experience and an on-campus, semester long, learning community course.

2.7 Limitations

Our study utilized a convenient sample of undergraduate students enrolled in a study abroad and semester long course. The results of our small case study, where students self-selected to take the course, could not be generalized to larger populations but provide a framework for

future studies to build on. Duration and location of programming can also impact student intercultural development. Although intercultural competence was focused on during the entire program, students traveled abroad internationally for only ten days. Additionally, location, content of the program, and embedded activities of the international experience may all be factors that could impact intercultural development.

2.8 Summary

Our study utilized a small convenient sample of nine students enrolled in a short-term study abroad experience and on-campus course. We evaluated the effectiveness of a combined study abroad and learning community course on student intercultural competence and empathy development. Deliberate intercultural interventions were provided throughout the program. Although no overall group intercultural competence was observed, 55.6% of students in the program progressed meaningfully on the IDC. Using the IKC VALUE rubric, we were able to demonstrate the development of empathy in our program participants. Empathy is a critical skill that can increase agricultural graduates' success in the workforce. This is one of the first reported studies in animal science to specifically evaluate the development of empathy in undergraduate animal science students. Results from our study provide further evidence that specific components of intercultural competence, such as empathy, can be intentionally developed in undergraduate curricula.

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CHAPTER 3. DEVELOPING STUDENT INTERCULTURAL COMPETENCE IN AN INTRODUCTORY STEM-BASED COURSE

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Jacey Wickenhauser and Elizabeth L. Karcher

3.1 Abstract

The agricultural workforce is increasingly diverse. Therefore, it is essential that graduates possess the skills to excel in a global setting. Employers seek students with developed intercultural competence (IC) and the ability to work in diverse environments. Study abroad programming is one strategy to develop IC in students, but a majority of university students do not participate in international programs. In light of these limitations, potential exists to embed IC development in on-campus curriculum. Our objective was to measure student IC development after their completion of a 16-wk STEM-based, on-campus introductory course with embedded intercultural activities. In Fall 2019, 168 students enrolled in the course and were assigned to intervention (n=104) or control (n=64) groups based on their randomly selected laboratory period (n=5). Students in the intervention group received five intercultural learning assignments throughout the semester, while students in the control group received five unrelated assignments. The Intercultural Development Inventory was administered to all students during weeks 2 and 15 (response rate = 93%). Students in the intervention group showed increased intercultural development compared with students in the control group ($p < .0004$). Implementing targeted intercultural activities into STEM-based courses may be one method to develop students' intercultural competencies and improve their ability to thrive in a diverse workplace.

Keywords: intercultural learning, undergraduates, IDI, STEM, agriculture

3.2 Introduction

World economies and cultures are becoming increasingly interdependent of each other due to an increase in international trade of things like technology and other goods and services (Kolb, 2019). The term to describe this trend is globalization, and it is becoming increasingly prominent in agricultural industries (Robinson, 2018). An example of this trend is the number of hired farm workers involved in US agricultural production. Hired labor accounts for 43% of the expenses for greenhouse and nurseries and 39% of expenses in fruit and vegetable production. Much of this hired labor comes from foreign-born people primarily from Mexico and Central America that work in essentially every agricultural occupation. There is around 1.15 million hired farm workers in the US agriculture industry today with only 65% of that population being US citizens (USDA ERS, 2020). From this alone we see that even if undergraduate students work in the US agriculture industry their entire lives, it is likely they will be interacting with people of different cultures and backgrounds.

Due to trends like this, agricultural employers seek to recruit a workforce full of diverse perspectives and experiences (AgCareers, 2018). This trend has resulted in the need for college graduates from agricultural programs to have the skills necessary to navigate and work in diverse, cross-culture environments. These skills, such as self-management, leadership, communication, working in teams, and problem-solving, are highly desired by agricultural employers (Crawford et al., 2011; Morgan, 2012). However, these are also the skills often cited as lacking in new graduates (Crawford et al., 2011). Compounding this issue, students may be even less capable in effectively utilizing these skills in environments different than those they are familiar with. As a result, many colleges of agriculture throughout the United States now include development of intercultural competence (IC) as a learning outcome in undergraduate curricula.

IC is the ability of a person to react appropriately and effectively communicate in intercultural situations (Deardorff, 2009). Examples of IC skills include cultural self-awareness, empathy, verbal and nonverbal communication, curiosity, and openness. Educators have sought various methods to utilize undergraduate curricular opportunities to foster development of these skills. International programming, such as study abroad, has become increasingly popular among undergraduates in recent years (USA Study Abroad, 2018). There is a direct link between study abroad programming and deliberate intercultural intervention in the development of undergraduate IC (Behrnd and Porzelt, 2012; Krishnan et al, 2017) However, despite being popular, only approximately 11% of the U.S. undergraduate population participate in study abroad programs (Redden, 2019). Moreover, study abroad is not an option for many students due to lack of desire, costs, and domestic obligations (Deviney et. al., 2014)

Embedding intercultural learning into on-campus undergraduate curricula provides the potential opportunity for all students to benefit from intercultural activities. Providing these intercultural learning opportunities in on-campus course curriculum allows more students to have access to the educational and professional benefits gained through international programming, without students having to go abroad or complete large amounts of extra work outside of the classroom. Feng (2016) implemented personal intercultural development interventions in the curriculum of an international management course and observed increases in student IC as measured using the Intercultural Effectiveness Scale. Snodgrass et al. (2018) explored IC of undergraduates and found significant increases in IC in students who participated in guided on-campus service-learning activities throughout the semester compared with students who did not participate in such programs.

It is well established that employers are looking for specific essential skills in college graduates (Crawford et al., 2011; Morgan, 2012). Several of these skills, such as communication, are recognized as essential and influence the student's ability to utilize intercultural skills (AAC&U, 2009). The overlap of similar constructs emphasizes the need to develop IC in all undergraduates, not just those with the resources or desires to study abroad. By integrating intercultural learning interventions into undergraduate courses, more students will have opportunities to practice and develop the essential skills employers want. Therefore, the objective of this study is to determine student IC development after completion of a 16-wk STEM-based introductory course with targeted intercultural activities.

3.3 Materials and Methods

3.3.1 Course Information

This study was deemed exempt by the Purdue University Institutional Review Board (IRB-2019-10). Targeted interventions (Table 3.1) were embedded in an introductory STEM course at a large midwestern land-grant university with the objective of developing student IC. The class, an introductory course on animal agriculture, took place in Fall 2019 with 168 undergraduate students. Classes were held over a 16-week semester with two 50-minute lectures per week and one 1-hour and 50-minute laboratory. Students were assigned to an intervention (n=104) or control (n=64) group based on their randomly selected laboratory period. Due to the size of the class, students were assigned to one of five laboratory sections with up to 35 students per sections. Students in three of the laboratory sections (intervention group) participated in five reflective intercultural learning assignments throughout the semester, while the students in the two remaining labs (control groups) participated in five animal science-themed reflective assignments that did

not contain an IC focus. During weeks 3, 5, 8, 11, and 14 of the semester, students in the intervention groups participated in 15 minutes of guided discussions and then were assigned an out-of-classroom task complimented with an associated written reflection (Table 3.1). During the same weeks, students in the control groups were given assignments to read a recent news article related to animal agriculture (not IC-related) and complete guided written reflective questions. All students were given one week to complete assignments and received their assignment grades and written feedback back within a week.

Table 3.1 *Description of the activities and week administered for students in the intercultural intervention and control groups.*

Week	Intercultural Intervention	Control
3	Group IDI Debrief and Reflection Assignment	Article Reflection
5	“Who I am” poem and class discussion	Article Reflection
8	Visit to an Ethnic Market Assignment	Article Reflection
11	6 Differences and related reflection assignment	Article Reflection
14	Second IDI debrief assignment	Article Reflection

3.3.2 Student Demographics

The majority of students in the class (n=135; 80.4%) were animal science majors with 19.6% of students majoring in an area other than animal science (n=33). Students were 81.5% female (n=137) and 18.5% male (n=31). The majority of students were classified as first-year students (n=113; 67.2%) followed by second-year students (n=45; 26.8%), third-year students (n=7; 4.2%), and fourth-year students (n=3; 1.8%).

3.3.3 Instrumentation

Intercultural competence was assessed using the Intercultural Development Inventory (IDI), which students completed during weeks 2 and 15 of the semester (IDI, 2020). The IDI is a 50-item online questionnaire designed to assess intercultural competence. It has been validated for use with our student population and has strong content and construct validity across different cultural groups (Hammer, 2011). Numerical results from an individual's IDI are expressed as a stage on the Intercultural Development Continuum (IDC). The IDC includes stages of monocultural mindsets (denial, polarization, and minimization) and stages of intercultural mindsets (acceptance and adaptation), and then places students in one of the stages based upon their results (Hammer, 2012). Only data from students completing the pre- and post-IDI was included in the analysis (n=157; 93.5% completion rate).

3.3.4 Intercultural Assignments

In order to promote maximum intercultural development in the intervention groups, assignments in this study were designed to target the stages of polarization and minimization on the IDC. Several assignments were selected from Purdue University's Intercultural Learning Hub (HubICL, 2020), and were selected to encourage development of self-awareness, knowledge of world-view frameworks, curiosity, and openness.

At the completion of the IDI, students in the intervention group received an Intercultural Development Plan (IDP). The IDP is individualized for each student and serves as a guide to support IC development (Hammer, 2012). Students did not complete the entirety of the IDP, but were given access to it so they could have a better explanation of where they fell on the IDC, and to help them formulate two goals of how they could work to increase their IC outside of class. Students were instructed to formulate very specific and measurable goals that could be completed

by the end of the semester. Some suggestions given to students were to attend an event focused on a culture they were not familiar with, watch a movie reflective of a different culture, or to prepare and eat a meal with a friend or colleague from another culture other than their own that is representative of the friend's culture. In the last assignment of the semester, students completed written reflections on how whether or not they met their goals, barriers they faced when completing the activities, and what they enjoyed or did not enjoy about their selected activities.

3.3.5 Statistical Analysis

The data analysis for this paper was generated using SAS© software (SAS Institute Inc., 2002-2012). The GLM procedure was used with the model including the differences between the intervention and control group's pre- and post-IDI scores. Experimental units included all students in the intervention groups and all students in the control groups. The GLM procedure was also used with the model including the intervention and control group's post IDI scores. Means and standard error of the data were reported. Statistical significance was declared for both models at $p < 0.05$.

3.4 Results

3.4.1 Group Intercultural Development

At the start of the course, there were no differences in the IDI results between students in the control and intervention groups (87.46 ± 2.05 vs. 85.30 ± 1.43). At the completion of the semester, significant differences were observed between the control and intervention group means (87.54 ± 2.09 vs. 94.76 ± 1.67) ($p < .008$; $df=1$; $f=7.29$) (Figure 3.1). The overall progression of IC growth was also greater in the intervention group compared with the control ($p < 0.004$; $df=1$; $f=13.23$). On average, students receiving intercultural intervention increased 9.46 ± 1.72 points on

the IDC, while students in the control groups responded with an almost negligible increase (0.074 ± 1.79). As a group, both the intervention and control groups remained in minimization throughout the semester, indicating the majority of students were still functioning in a monocultural mindset.

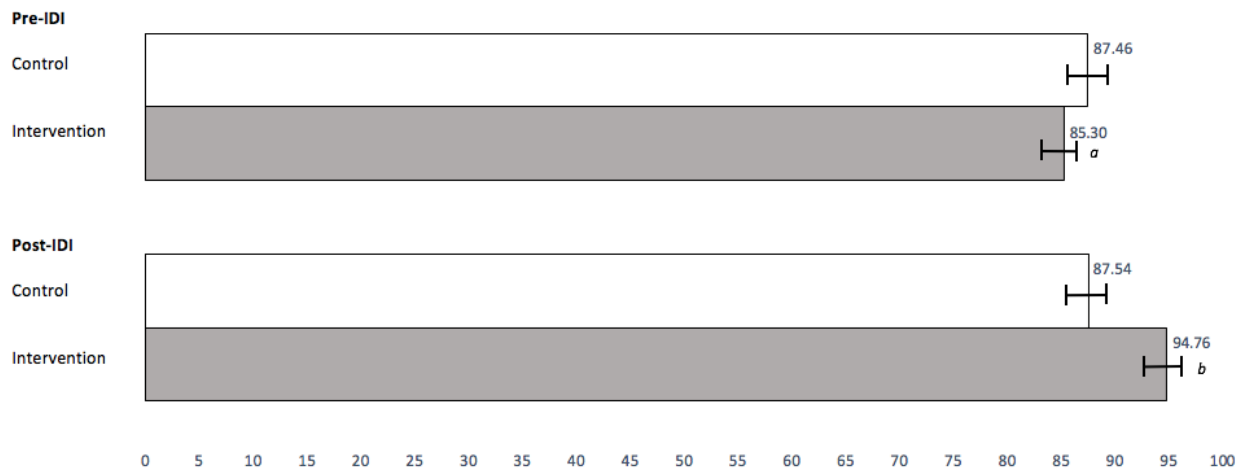


Figure 3.1 *Pre- and post-Intercultural Development Inventory scores for students enrolled in a 16-week introductory animal science course with deliberate intercultural assignments (intervention group; n= 96 students) vs. students participating in the same course, but with no intercultural interventions (control group; n= 62 students) groups. Superscripts indicate statistical significance at $p <$*

3.4.2 Group Movement Between IDC Stages

While it is important to evaluate IC growth within groups, it is also advantageous to consider individual changes along the IDC continuum. At the beginning of the semester, there was a similar percentage of students in both groups operating in denial (18.75% vs. 17.74% for the intervention vs. control group, respectively; Table 3.2). At the end of the semester, there was a shift in these numbers with 11.29% of students in the control group operating in denial compared with 5.20% of students in the intervention group. The decreased percentage of students from the intervention group in denial illustrates that students developed the skillset during the semester to acknowledge and see cultural differences. We did note a large increase (20.84%) in the number of

students in the intervention group moving from polarization to minimization from the beginning to end of the semester. Students in minimization most likely are able to see differences in cultures and are able to suspend judgement in their views of these differences. Our results support that many students in the intervention groups progressed on the IDC, while students in the control group may be as likely to regress as they are to progress (Table 3.2). Together, observing progression and regression of students across the continuum provides a more holistic view and understanding of the differences observed between the control and intervention groups.

Table 3.2 *Percentage of students in each stage of the Intercultural Development Continuum, pre and post intercultural interventions, and the percent change between pre and post interventions.*

	Intervention (n=96)			Control (n=62)		
STAGE	Pre (%)	Post (%)	Change (%)	Pre	Post	Change (%)
Denial	18.75	5.20	(-)13.55	17.74	11.29	(-)6.45
Polarization	38.54	23.96	(-)14.58	27.42	40.32	(+)12.90
Minimization	39.58	60.42	(+)20.84	50.00	45.16	(-)4.84
Acceptance	3.13	10.42	(+)7.29	4.84	1.60	(-)3.24
Adaptation	0.00	0.00	No change	0.00	1.60	(+)1.60

3.5 Discussion

Intercultural competence of undergraduate students can be developed through intentional interventions both inside and outside the classroom. While these interventions can occur in traditional study abroad programming (Krishnan et al., 2017; Nguyen 2017), it may be possible to introduce effective intercultural interventions on the student's home campus (Feng, 2016;

Senyshyn, 2018; Snodgrass et al., 2018). International programming is a popular option to expose students to intercultural learning. Because only 10.9% of undergraduates in the United States will study abroad during their degree program (Redden, 2019), an opportunity exists to develop strategies to expose students to intercultural learning in the on-campus setting.

A four-stage model for intercultural development in the traditional classroom was proposed by Feng (2016). The model focused on reflective development and consisted of the following stages: awareness, experience, reflection and assessment. While the present study did not follow this model exactly, elements of it can be seen throughout the study. The students in our study began the semester completing intercultural learning activities that helped them target their own cultural self-awareness. Throughout the semester students were able to participate in a variety of intercultural experiences through in-class and out-of-class activities, with guided written and oral reflection, as well as having the IDI serve as the assessment piece.

Similar to our present study, Snodgrass and colleagues (2018) sought to increase undergraduate's intercultural sensitivity in a large midwestern college of agriculture. Students participated in a course with flipped design, with multiple requirements for students to participate in service-learning experiences throughout the semester. Students participating in the course showed significant growth in IC based on pre and post semester IDI assessment (Snodgrass et al., 2018). Our present study used similar strategies to implement intercultural learning the classroom. Our focus was not specifically on service-learning experiences, but by implementing targeted intercultural interventions that included assignments both inside and outside the classroom, we also observed growth in student IC, and at levels greater than seen in students not participating in the international aspect of the class. While it is clear that IC can be developed through various

instructional strategies, it is apparent that these strategies and assignments must be intentionally integrated throughout the course or program.

By increasing students' intercultural skills, we aim to allow students opportunities to enhance many of the essential skills, often cited by employers as lacking in graduates, to better prepare them for success in the agricultural workforce. In 2011, the Association of Public and Land-grant Universities conducted a comparative analysis of desired essential skills, or soft-skills, sought by agricultural industry employers. Seven clusters of these skills were identified and included: communication, decision making/problem solving, self-management, teamwork, professionalism, experiences, and leadership skills (Crawford et al., 2011). More recently, agricultural industry leaders ranked dependability, critical thinking skills, strategic planning, and communication as competencies graduates need upon entering the workforce (Easterly et al., 2017). Many of the intercultural skills listed on the AAC&U Intercultural Knowledge and Competence VALUE rubric (AAC&U, 2009) align with these essential skills including communication and the knowledge of worldview frameworks. Providing students with a better understanding of different worldview frameworks may increase their teamwork skills, as well as improve communication with culturally diverse people. Therefore, the need for enhanced interpersonal skills further highlights the necessity to embed intercultural learning opportunities in on-campus curricula.

3.6 Limitations and Future Considerations

While our results provide evidence that IC can be developed in the classroom with intentional intervention, our study is not without limitations. Our population was limited to undergraduate students at one land-grant, midwestern university with the majority of students identifying with the animal sciences major (80.4%). Further studies are needed to apply these findings to larger university populations. A limitation specific to the use of the IDI is that students

did not complete the entirety of the IDP or receive an individual debrief session with their IDP's. We recognize this did not give students the full level of learning that can come with completing those steps. Another limitation is that we do not know which culture every student identifies with most. For example, it is possible that students raised in an urban setting could respond to the interventions differently than a student raised in a rural setting. An important consideration to note is that the majority of our participants were first-year students ($n = 67.2\%$), which demonstrates an opportunity to begin implementing intercultural interventions early in academic programs. However, we know that freshmen often experience significant growth in areas like intercultural maturity by just being in a new setting like college, which could account for some of the growth seen in this study.

Future plans include embedding intercultural learning into assignments relating to the theme of the overall course. For example, one way to do this would be using real-world animal science scenarios to embed intercultural learning in an authentic context that relates to course material and student interest.

3.7 Summary

Our long-term goal is to develop a model for integrating intercultural learning in STEM-based introductory courses. In our present study, students showed significant growth in IC when deliberate intercultural learning assignments were embedded in their regular course activities. Integrating intercultural competence in classroom curricula provides a promising alternative to relying on off-campus international experiences to develop intercultural competencies.

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CHAPTER 4. REMOTE LEARNING AND INTERCULTURAL COMPETENCE: FOSTERING STUDENT SKILL DEVELOPMENT DURING A GLOBAL PANDEMIC

A version of this chapter has been submitted for review.

J. Wickenhauser^{1*}, A. Rosenkrans¹, P. Ebner¹, E.A. Flaherty², and E.L. Karcher¹

4.1 Abstract

For many instructors, 2020 brought a need to adjust teaching strategies for remote learning due to the COVID-19 pandemic. In Fall 2020, we transitioned an Introduction to Animal Agriculture course from face-to-face to a remote format. The change presented challenges in implementing engaging teaching pedagogies to create an online student-centered learning environment. Even in an online format, it is necessary to develop student intercultural competence (IC) as the agricultural industry is becoming increasingly globalized. Therefore, the objective of the study was to measure changes in student IC before and after participating in the remote course with intercultural learning (ICL) assignments embedded into animal science topics. Students (n=161) were assigned to an intervention (n=93) or control (n=68) group based on their randomly selected laboratory period. Students in the intervention group received five ICL assignments focused on global animal agriculture while students in the control group received five unrelated assignments. A pre- and post-course Intercultural Development Inventory was administered to all students (response rate=88.2%). Students in the intervention group had a greater increase in IC compared with the students in the control group ($p<0.01$). Our results, although limited to one course, suggest that IC may be developed in students by embedding ICL assignments into course curriculum.

Keywords: agriculture, animal science, intercultural learning, remote learning

4.2 Introduction

In 2020, the COVID-19 pandemic brought many challenges to universities around the United States. As the virus swept across the nation, impacting essentially every industry, universities were forced to evaluate how to continue providing exemplary education to students while following restrictions to keep employees and students safe. For many universities, this involved quickly transitioning all in-person classes to an online format for some period of time (Sahu, 2020). Switching to a remote learning platform, especially when the transition occurs under emergency situations, raises a variety of challenges such as an educator's ability to navigate the technology, students who may not have reliable computer access, and the need to find a way to teach laboratory courses online (Sahu, 2020). This transition may also present limitations in implementing engaging teaching pedagogies to create an online student-centered learning environment.

Graduating agricultural students will continue to work with others from different cultures around the world (Scott, 2015). Globally, industries are becoming interdependent on each other due to an increase of trade in goods and services as well as technology (Kolb, 2019). Employers are increasingly seeking college graduates that are prepared to work in a global industry and have the skills to work with others of diverse background (Agcareers.com, 2018). Therefore, it is critical that those studying agriculture in college are provided opportunities to learn how to thrive in a global setting

Intercultural competence (IC) is the ability of a person to react appropriately and effectively communicate in intercultural situations (Deardorff, 2009). Development of IC can be learned and developed throughout a lifetime. As a way to prepare undergraduate students for the increasingly diverse agricultural workforce, universities have been using various methods of teaching intercultural skills. IC can be developed in a classroom setting with intentional interventions and

during international programming, like study abroad, with targeted intercultural learning (ICL) interventions (Krishnan et al, 2017; Nguyen, 2017; Snodgrass et al., 2018). In addition to developing IC as a whole, specific skills can also be targeted, such as, cultural self-awareness, knowledge of worldview frameworks, verbal and nonverbal communication empathy, curiosity, and openness (AAC&U, 2009). Empathy, for example, can be learned and developed with international activities within an undergraduate curriculum (Batt-Rawden et al., 2013; Levett-Jones et. al., 2019). At a capstone level of intercultural skill, empathy is described as the ability to view the experiences of others from more than one worldview and to recognize different cultural perspectives in a supporting way (AAC&U, 2009). The specific skill of empathy will be necessary for students entering a global workforce as they will need to be able to respect and understand different ideas and ways of doing things than they may be used to.

During COVID-19, many universities switched to remote, online learning (Gamage et al., 2020). The removal of face-to-face interaction created new challenges for students and teachers alike. Fortunately, online learning has become more popular in recent years as universities attempt to make courses more readily available for students (Palvia et al., 2018). Because of the growing popularity of these online learning options, research has been conducted on remote learning methods and its effects on a variety of student learning outcomes. It has been found that engaging students online requires adding opportunities to engage critical thinking skills and facilitating a sense of belonging between peers (Stavredes & Herder, 2020). Knowing this, the present study used engaging methods of teaching intercultural competence so it could still be incorporated into an online course.

Developing student IC in remote learning has been an often-neglected point of research, but is an important skillset to develop in students, especially in remote learning environments. In a

study by Iseminger et al. (2020), the level of student IC development between students in a face-to-face diversity course were compared with those of students in an equivalent online course. Students in the online course not only demonstrated increases in IC, but they did so more than students in the face-to-face course. The results of this study could be due to several outside factors including, student interest, students in the online portion could have been exposed to other activities that were not controlled, or the students in the face-face course could have had more negative experiences than those in the online course. This study provides encouraging results that even in a remote learning environment, students are still able to practice their IC skills.

Developing IC in an online format is critical and can be done using different methods. Implementing reflection-based assignments are one way to foster this development of IC and empathy in course curriculum. Reflecting allows students to deepen the impact of what they are learning (Wilbur, 2016). Feng (2016) recorded an overall increase in IC in undergraduates when utilizing reflection assignments in addition to personal intercultural interventions throughout a semester long course. Results from a previous study we conducted also showed an increase in undergraduate IC when intentional reflective assignments were given to undergraduates (Wickenhauser & Karcher, 2021). Lee (2018) used classroom activities combining self-reflections to target the development of empathy in students and found that implementing these specific activities did show an increase in students' level of empathy.

Intercultural competence and specific skills like empathy are necessary for students to develop. Opportunities to practice and grow these skills need to be incorporated into undergraduate curriculum, even in remote learning environments. Therefore, the objective of this study is to observe student IC and empathy development before and after completing a series of reflection based ICL assignments focused on animal science topics in a remote learning environment.

4.3 Materials and Methods

4.3.1 Course Information

Targeted reflection interventions were embedded in an introductory level online animal science course with the objective of developing students IC. This course took place in the fall semester of 2020 with 161 undergraduate students enrolled. Traditionally, the class was taught face-to-face. However, in 2020, the class was conducted in a remote learning environment due to COVID-19. Students met synchronously twice a week with one meeting being a 50-minute lecture and the other a 1-hour laboratory discussion period. All synchronous meetings occurred via WebEx. Students were randomly placed in one of five laboratory sections. Additionally, students completed asynchronous online modules at the start of each week that presented course material. Modules were administered via Storyline 360 and included a number of interactive elements to engage students. The majority of students in this course were first-year students (N=97; 60.2%). The remaining students consisted of second-year students (N=46; 28.6%), third-year (N=13; 8.1%), and fourth-year (N=5; 3.1%). A large percentage of the students in this course were Animal Sciences majors (N=110; 68.3%) with the minority of students in a different major (N=51; 31.7%).

Students were assigned to either an intervention group (N= 93) or a control group (N= 68) based on the laboratory section in which they were enrolled. The intervention group included students in three laboratory sections while the control group included students from the remaining two sections. Students in the intervention group completed five targeted reflection assignments throughout the semester designed to develop their IC, while the control group completed five reflection assignments not related to IC development (Table 4.1). Each group was given one week to complete their respective assignment and received feedback within the next week. At the beginning of the semester, during a synchronous class session, all students enrolled in the course

participated in a lecture given by an industry professional that focused on the importance of learning the skills necessary to work with diverse groups of people. This lecture assisted in providing students with the “so what factor” of why they should be aware of their intercultural competence and the connection to workplace success. The goal was also to provide relevancy to students in the intervention group as they completed ICL reflections. All methods were reviewed by the Institutional Review Board at Purdue University and deemed exempt.

Table 4.1 *Description of the activities and week administered for students in the intercultural intervention and control groups.*

Week	Intercultural Intervention	Control
5	First IDP Reflection Assignment	Article Reflection
7	The Global Role of Dairy Production Reflection Assignment	Article Reflection
9	The Global Role of Aquaculture Reflection Assignment	Article Reflection
11	The Global Role of Chicken Production Reflection Assignment	Article Reflection
13	Second IDP Reflection Assignment	Article Reflection

4.3.2 Intercultural Competence Instrumentation

Student’s IC was assessed using the Intercultural Development Inventory (IDI, 2020), which students in both the intervention and control groups completed at week 3 (N=158; 98.1%) and week 14 of the semester (N=144; 89.4%). The IDI is 50-item online questionnaire that assess individual levels of IC. The IDI is a widely used tool across cultures and has been validated to use with our population of undergraduate students (Hammer, 2011). When an individual takes the IDI, their results are scored on a scale between 55 and 155 that then places them on a continuum called

the Intercultural Development Continuum (IDC). Along with providing a numerical value, the IDC also identifies different stages of IC that ranges from monocultural to intercultural mindsets. These stages in order on the IDC are *denial*, *polarization*, *minimization*, *acceptance*, and *adaptation* (Hammer, 2012).

4.3.3 Intercultural Interventions

As mentioned previously, students in the intervention group completed a variety of assignments throughout the semester designed to develop their IC (Table 4.1). Once completing the IDI, students in the intervention group received their individual Intercultural Development Plan (IDP) which provides examples and strategies for the student to further develop their IC. In addition to receiving their IDP, all students in the intervention group were given a group IDI debrief by a qualified IDI administrator. For their first ICL assignments, students were asked to reflect on their IDP and use examples given in it to formulate two goals they would work on outside of class to develop their own IC throughout the semester. The last ICL assignment of the semester then asked students to recall their goals set during the first assignment, reflect on progress they had made in completing them, and identify any barriers in doing so.

The middle three assignments were focused on different topics related to the global role of animal agriculture. The first week of the laboratory discussion focused on the global role of animal agriculture to set the stage for these assignments. In addition to that, each week that students had an ICL assignment due it was discussed during their laboratory section. These weekly group discussions were facilitated to build a sense of belonging and trust between students, their peers, and instructors.

These three reflections were designed to give students an in-depth overview of a specific area of animal agriculture in different cultures, specifically in developing countries. Each of the

three assignments followed a similar pattern. Students would be asked to read through general information about the topic and respond to three-four reflection questions. They then watched a short video showing a more personal view of the topic in a developing country and responded to two-three reflection questions about the video. These assignments focused on animal science topics in a global context as a way to help students think from a different culture's perspective, and in turn, develop an increased IC. Each assignment included guided reflection prompts to encourage students to recall what they learned, found interesting, and provided an opportunity to express how the assignment helped them to think differently.

4.3.4 Empathy Instrumentation

In addition to overall IC, development of student empathy was assessed using qualitative coding methods (Miles et al., 2014). As previously stated, students in the intervention group completed five ICL assignments throughout the semester. Four of the assignments contained one open prompt that was included to encourage demonstration of empathy. The first and fourth prompts were evaluated to track student progress throughout the semester, and only students who completed all four prompts were evaluated (N=61; 65.6% response rate; Table 4.2).

The prompts were then evaluated by one trained reviewer using the AAC&U Intercultural Knowledge and Competence (IKC) VALUE Rubric. The rubric is an instrument which targets six specific intercultural skills, knowledges, and attitudes, including empathy. The rubric was used as a guide to identify the developmental level of empathy students were functioning in based on their reflective responses, as the rubric provides levels ranging from 1 (benchmark) to 4 (capstone) (AAC&U, 2009). Deductive coding was chosen as it is a narrower approach than inductive coding and allows the identification of previously established theoretical frameworks found in literature (Linneberg & Korsgaard, 2019). In addition, magnitude coding was included as it allows specific

numbers or levels to be assigned to coded data as a way to organize the data (Miles et. al., 2014; Weston et. al., 2001). Because the IKC VALUE Rubric ranges from levels 1-4, this process of deductive coding in addition to magnitude coding allowed us to place students in a specific level of empathy which we could evaluate from the beginning to end of the semester.

Table 4.2 *Description of the ICL Assignments that included empathy prompts, with the empathy students responded to listed.*

Week	ICL Assignment	Empathy Prompt
5	First IDP Reflection Assignment	<i>Explain what you think empathy is and describe a time when you showed empathy to someone, or when someone showed you empathy.</i>
7	The Global Role of Dairy Production Reflection Assignment	<i>What is your reaction to this short video showing the process to send milk to the market in East Africa?</i>
9	The Global Role of Aquaculture Reflection Assignment	<i>What are your general thoughts, reactions, or feelings after watching this video? Please provide 2-3 specific things you noticed.</i>
11	The Global Role of Chicken Production Reflection Assignment	<i>What are two things that you found surprising or interesting from this video and why?</i>

4.3.5 Statistical Analysis

Quantitative Analysis

The data analysis for this paper was generated using SPSS. Normally distributed paired T-tests were conducted to evaluate differences between the intervention groups -pre and -post IDI

scores ($p < .05$) as well as the control group -pre and -post IDI scores ($p > .05$) The GLM procedure was conducted to measure differences in change in the intervention and control group. This model included the differences between the intervention and control group's -pre and -post IDI scores. Experimental units included all students in the intervention groups and all students in the control groups. Means and standard error of the data were reported. Significance declared at $p < .05$

Qualitative Analysis

Empathy development was analyzed qualitatively using deductive coding methods in accordance with the AAC&U IKC VALUE Rubric (AAC&U, 2009). Magnitude coding was implemented to align with the rubric as it ranges from benchmark (level 1) to capstone (level 4). Student responses were analyzed using this rubric scale of 1-4.

In addition to analyzing empathy, an end of the semester focus group was conducted by a graduate teaching assistant in the course with a sample of 6 students in the intervention group. This focus group lasted approximately 1 hour and consisted of 4 questions about student's experiences with, and their perspectives of the ICL assignments. Questions included:

1. *Did the reflections help you see things from another perspective you hadn't thought about before? Provide examples of how. If not, why not? What could be done differently?*
2. *Did you see value with completing the intercultural learning assignments in this course? Why or why not?*
3. *Did you enjoy learning about global animal science topics? Would you enjoy learning about other topics similar to the three reflections this semester? Why or why not? (dairy, aquaculture, and poultry)*
4. *What did you think about the format of these reflections? (read through a website, watch a short video, answer reflective questions). What would you have done differently?*

The goal of this focus group was to gain student insight on their level of interest in learning about animal science topics and if they saw the value in completing the ICL activities. The focus group took place at the end of the semester so students could give honest reflection and answer the questions without fear of it affecting their grade in any way. Throughout the semester, the teaching assistant leading the focus group had an opportunity to establish relationships with the students which allowed students to feel more comfortable participating in the focus group. This group was conducted via Zoom and recorded so the teaching assistant could listen to the students during the session and be able to go back through the recording to gather more precise qualitative data. Students also filled out an open-ended questionnaire that included the same questions asked during the focus group so they could also share their thoughts in written form. Data from both the recorded session and written questionnaires were analyzed using inductive coding to gather themes and quotes from students.

4.4 Results

4.4.1 Group Intercultural Development

After students completed the first IDI at week 3, no difference was observed between the control group and intervention group's mean IDI results (87.75 ± 1.97 vs. 87.28 ± 1.43 ; $p > 0.05$). As a group, students were operating in *minimization* (N=77; 47.8%). This indicated that the majority of students could often recognize cultural differences but minimize those differences and focus more on similarities between the cultural groups. Because students were in *minimization*, questions in the assignments were created to facilitate deeper thinking of cultural differences and encourage students to view those differences as important for cultures.

At week 14, after the intervention group had completed a series of ICL assignments, there were significant differences observed between control and intervention group IDI results (86.75 ± 2.11 vs. 95.29 ± 2.35 ; $p < 0.004$) (Fig.4.1). The progression of growth was also more significant in the intervention group than the control group ($p < 0.029$; $df=1$; $f=9.17$). On average, the intervention group increased 5.77 ± 1.52 points on the IDI while the control group saw miniscule change, decreasing an average of 0.99 ± 1.53 points.

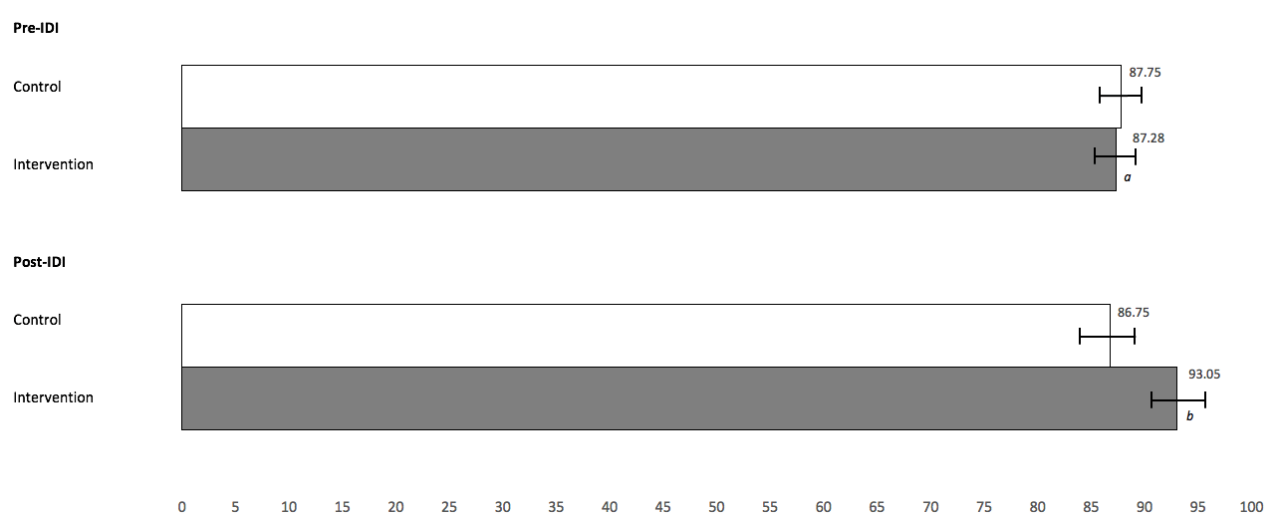


Figure 4.1 *Pre- and post- Intercultural Development Inventory scores for students completing a series of intercultural learning assignments throughout a semester long, online course (N=93) students in the same course who completed no intercultural learning assignments (N=68). Superscripts indicated statistical significance seen between the difference of the intervention group's pre- and post- scores at $p < .05$*

When discussing group change on the IDI, it is also important to consider student movement on the stages of the IDC to gain a holistic view of the group development. At the beginning of the semester, the number of students in both the intervention and control group operating in the respective stages was similar (Table 4.3). However, by the end of the semester, we observed a shift within the intervention group; fewer students were operating in *denial*, and

more students moved into the stage of *acceptance*, showing a positive development of IC. The control group, however, did not have any students in acceptance, and more students functioning in denial.

Table 4.3 *Percentage of students in each stage of the Intercultural Development Continuum, pre- and post- intercultural interventions, and the percent change between pre and post.*

	Intervention (n=84)			Control (n=58)		
STAGE	Pre (%)	Post (%)	Change (%)	Pre	Post	Change (%)
Denial	8.3	7.1	(-)1.2	8.6	18.9	(+)10.3
Polarization	36.9	32.1	(-)4.8	29.3	29.3	No Change
Minimization	52.4	47.6	(-)4.8	56.9	51.7	(-)5.2
Acceptance	2.4	11.9	(+)9.5	5.2	0.0	(-)5.2
Adaptation	0.0	1.2	(+)1.2	0.0	0.0	No Change

4.4.2 Group Empathy Development

Empathy data was analyzed only from students who completed all four of the empathy response assignments (N=61). At the beginning of the semester, 49% of students demonstrated empathy responses that were indicative of a level 1 on the AAC&U IKC VALUE Rubric. Out of the students who showed empathy on the last prompt (N=50), only 36% of students were still functioning at level 1 at the end of the semester (Fig 4.2.). When students function at a level 1 of empathy, they often only view the experiences of others through their own perspectives and respond based on their own experiences and knowledges (AAC&U, 2009). At the end of the semester, the majority of students were functioning at a level 2 of empathy (N=52.0%), meaning that students identified some cultural differences, but still responded according to their own

worldviews. While only 3.3% of students were functioning at level 3 empathy at beginning of the semester, by the end of the semester, 12.0% of students were functioning at level 3. This shows a progression of empathy throughout the semester, which adds evidence to support that empathy can be developed in students with intentional ICL assignments. However, it will likely require multiple different interventions to lead to this improvement seen in ICL.

Selected quotes from student responses to multiple prompts are indicated below each level of empathy. The quotes below were chosen to represent the different ways students could respond at each level. These student quotes provide further evidence of student progression throughout the semester and show examples of statements for each of the 3 levels of empathy observed in our study.

Level 1. At this level students often use “me” statements and may try to connect with other cultures but respond based on their own experiences and perspectives and add assumptions to what a group of people are feeling. In our responses, students often focused on what other people do not have, did not acknowledge benefits of doing things differently, and kept the assumption that what they are used to as best.

“I just thought that was amazing that he was happy and could provide for the people that he cared about... While watching this I felt happy that they were able to create a community where everyone benefits and that their living situation improved and that they are all much happier.”

“I show empathy in all of my relationships. I really try to be empathetic and put myself in their shoes to understand what they are truly going through. I try to relate something I went through with what they are going through.”

Level 2. Students in level 2 can more easily acknowledge differences and why they appear in different cultures. In our study, students at this level often recognize why things are done

differently and that they may have their own biases. However, they still make assumptions about a group of people or hold on to their point of view.

“I thought it was innovative of them to think of how to handle their situation and make it work for them. I think being used to seeing how things are done in the U.S. I don’t think about how it can be done differently to people that don’t have the same circumstances as us.”

“That thing that I found the most surprising was that the people had to teach the farmers and cooks how to properly wash their hands. I thought this was interesting because I would have never thought about how people from other places don’t know how to do things that we think of as common everyday task”

Level 3. Students expressing a level 3 show that they could recognize cultural differences and were using fewer assumptions in their responses. Student responses at level 3 show that they are beginning to value cultural differences and may be able to respond from a worldview different than their own at times.

“For some countries, like the US, farms have access to the technology to make dairy products as efficiently and quickly as possible. In places, such as East Africa, access to this technology is limited so there other ways of producing milk and selling it to the consumer. It also makes me think about that there is not a “right or wrong” way of producing dairy products, as long as it can be assured that it is healthy for consumption.”

“One thing I found interesting is that people did not eat the chicken meat or eggs produced, but rather sold the produce in order to pay for education, medical, or even buy their children other forms of food. I found this interesting because rather than just producing poultry for food, many families made the decision that education is more important and being able to make an income from raising chickens also opens up other opportunities, like paying for medical bills and buying other forms of food that may be more nutritious”

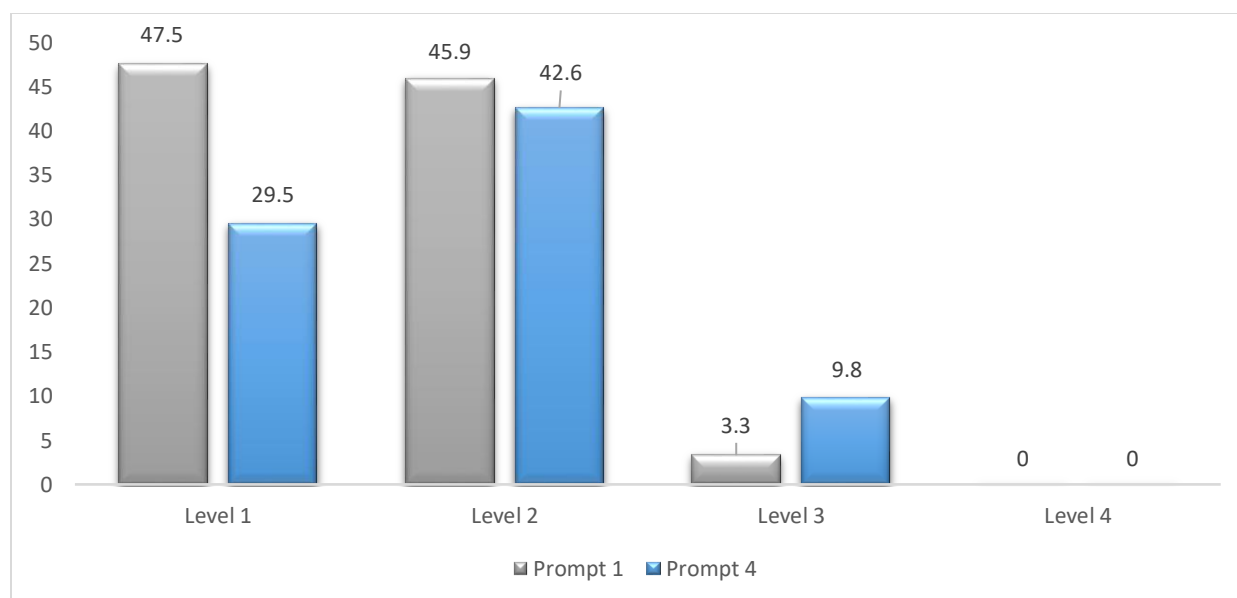


Figure 4.2 *Progression of empathy development of undergraduate student participants responding to written reflective prompts beginning with prompt 1 (beginning of the course) to prompt 4 (end of the course). 61 total students were included in analysis with 2 students showing no empathy during prompt 1 and 11 students showing no empathy at prompt 4.*

4.4.3 Focus Group Responses

Results from the focus group showed that students who completed the interventions showed positive responses from students about their experiences and perspectives. Analyzing student responses using the IKC rubric, highlighted that students both enjoyed learning about global animal science and were interested in and saw value in completing these interventions. Student responses are shown below to support this finding.

“Yes, I really enjoyed the reflection assignments and they allowed me to better understand the differences between animal science practices around the world. I had never considered the dairy industry in the US versus practices in Africa.”

“There is a lot of value in seeing how agriculture is done around the world. Industrializing and specializing isn't the only narrative and certainly shouldn't be the only goal. I am glad we got some of that context.”

“Yes, I believe more majors need to complete intercultural learning assignments. I didn't realize how much my views needed to grow and still need to develop and think that the IDI test really opened my eyes.”

“I did enjoy learning about global animal science topics. I really liked how we started by learning the global role of agriculture and the challenges we face in the future. I would enjoy learning about other topics similar to the three reflections this semester”

4.5 Discussion

The course described in this present study was forced to transition to a remote learning format due to COVID-19. Given the importance of developing IC skills in undergraduates, it was still a priority to incorporate ICL assignments despite the format change. This course utilized global animal science-based reflection assignments to build students' intercultural skills. It is necessary to create a sense of connectedness and foster critical thinking skills in students in online formats. To account for this, weekly synchronous group discussions were conducted to provide students with the ability to build relationships and further their reflection of their ICL assignments (Stavredes & Herder, 2020).

The majority of undergraduate students operate in *polarization* or *minimization* on the IDC (Sandell & Tupy, 2015; Snodgrass et al., 2018). Indeed, 54% of our students were in *minimization* and 34% were in *polarization* at the start of the course. At the end of the semester, 49% of students in the intervention group were still in *minimization*, but fewer were in *polarization* ($n=4.8\%$), and more students transitioned into *acceptance* ($n=9.5\%$). These results add support that implementing intentional interventions in course curriculum develops students' intercultural skills (Snodgrass et al., 2018; Wiersma-Mosley et al., 2020).

The number of students selecting online courses has increased steadily in the U.S. for several years, and these online options allow universities to reach more students (Paliva et al.,

2018). Compounding this, in 2020, responses to COVID-19 resulted in universities around the U.S. to rapidly transition to remote learning. Educators were forced to reassess teaching pedagogies and strategies to address teaching in online settings. As instructors for the course highlighted in this study, we also were forced to rethink how we could incorporate ICL activities in a remote format. In the online setting, it is even more critical to create engaging material that stimulates student interest and provides relevance (Khan et al., 2017). When students are interested in course material and have the opportunity to reflect on their learning experience, it leads them to deepen their understanding of the subject (Deci & Ryan, 2004; Wilbur, 2016). Feng (2016) followed a reflective development model in an on-campus course with intentional cultural interventions and saw an increase in student cultural awareness. Even in an online format, following similar steps and allowing students to reflect after each ICL assignment fostered their development of IC.

Iseminger et al. (2020) compared changes in student IC between the same diversity course conducted either face-to-face or online. Students completed guided service-learning activities throughout the semester and completed a reflective essay about their experiences at the end of the course (Iseminger et al., 2020). Similar to our present study's method of evaluating empathy, Iseminger et al. (2020) used the IKC VALUE Rubric to assess student's level of IC, and qualitative data suggested that students increased their awareness of their own cultural knowledge. In addition to this, the study observed a greater increase in cultural awareness of students in the online course compared with students who met in the face-to-face format (Iseminger et al., 2020). While our present study did not include service-learning activities, we provided targeted, reflective ICL assignments so students still had the opportunity to reflect on their experiences. Results of this

study support previous studies that IC can be developed in an online course with intentional interventions and reflective assignments can aid students in developing their own IC.

Empathy is a specific intercultural skill than can be targeted and directly developed (Lee et al., 2018; Levett-Jones et. al., 2019). Increased gains in students' empathy was observed when they completed activities targeted to increase empathy compared with students who did not complete the targeted assignments. (Lee et al., 2018). A gap in the literature exists in identifying teaching methods that increase empathy in students in online courses. Our present study addresses that gap as we observed a development of empathy in students who completed guided reflections designed to target empathy.

With the uncertain impact COVID-19 will have on future university courses, it is imperative that educators consider how to develop student intercultural skills in an online setting. This present study provides evidence that using reflective ICL assignments embedded in topics of student interest into online course curriculum may be one way to develop these intercultural skills in students. After completing a similar study that used ICL assignments unrelated to the course topics, students felt a disconnect and did not see the value in completing them (Wickenhauser and Karcher, 2021). In the fall of 2019, we utilized targeted interventions to develop student's IC in an introductory animal science course. For the 2019 study, we used targeted, reflection-based ICL activities that were separate from course curriculum. While results from that previous study showed a large increase of IC in students receiving the interventions, students did not find value or interest in the ICL activities. In the Fall of 2020 when our course transitioned ton an online learning format we still wanted to incorporate ICL into student learning. With some slight adjustments of our original methods of developing IC, we were still able to incorporate it into the course through the use of embedded assignments into the course topics.

On average, students in the 2019 intervention group increased 9.46 points on the IDI, and significantly increased more than those students in the control group. An increase of this size in an in-person class could be contributed to the fact that many students were being exposed to topics on culture for the first time. Several in class activities were conducted to allow students to interact together which is another factor contributing to this increase on the IDI. This increase prompted us to conduct this similar study in the same course in the fall of 2020. However, at the end of the 2019 study, it was found that some students had negative perceptions surrounding the targeted ICL activities. Students stated that the activities were unrelated to course material, and they struggled to comprehend their relevance. To account for this in our present study, ICL activities were designed to correlate directly with animal science curriculum, with activities focused on international animal science topics to better foster student's IC skills. At the end of the course, students felt a connection between the ICL activities and the course material, as well as found value in completing them. Information from a focus group conducted at the end of the semester, suggested that when ICL were embedded into animal science topics, students were interested in learning about them and understood their value.

Educators need to ensure that students are ready for a global workforce, regardless if students are taking in-person or online courses. Our study addressed this need by developing student empathy and intercultural competence using topics students were interested in and allowing them to reflect on their learning experiences.

4.5.1 Limitations and Future Considerations

The results from this study demonstrated a positive increase in student IC, however the study was not without limitations. This study was conducted in one introductory level course at a large Midwestern university where our sample was mainly animal science majors. More research

is needed in other courses, disciplines, and regions of the US before results can be generalized to a larger undergraduate population. Another limitation is that we did not record which culture(s) each student identifies with. We recognize that students from different cultures could respond to the interventions differently and that was not accounted for in this study.

Moving forward, we hope to continue to add methods of developing undergraduate IC by embedding activities into course curriculum. In the increasingly interconnected world, it is imperative that students have the skills to thrive in a diverse workplace setting. Embedding ICL activities into course curriculum is necessary to allow as many students as possible to practice their skills and develop their intercultural competence.

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CHAPTER 5. ESSENTIAL SKILL QUESTIONNAIRE: A SELF-REPORT MEASURE TO IDENTIFY STUDENT LEVEL OF ESSENTIAL JOB SKILLS

A version of this chapter has been submitted for publication.
J. Wickenhauser^{1*}, P. Ebner¹, E.A. Flaherty², and E.L. Karcher¹

5.1 Abstract

As agriculture industries become increasingly globalized, there is an increase of diverse ways of thinking, perspectives, and experiences in the agricultural workforce. As such, potential employers of agricultural graduates are seeking students with the behavioral competencies needed to thrive in diverse settings. There is little know about measurements that specifically measure these essential skills in agricultural undergraduate students. Therefore, we aimed to create the Essential Skill Questionnaire (ESQ) as a means to measures the development of essential skills in undergraduates. Through a comprehensive literature review, we identified five skills clusters as most often identified by employers as critical for new employees: 1) communication; 2)decision-making/problem-solving; 3) teamwork; 4) self-management; and 5) professionalism. We then created a survey-based instrument that measured essential skill development in undergraduates. The instrument was reviewed by a panel of experts familiar with fostering job skills in our undergraduate population to produce a 30 item questionnaire including reverse-coded scale items. The questionnaire was piloted with 161 undergraduate agriculture students and the results produced reliability coefficients (Cronbach's Alpha) for each of the five clusters of 0.71, 0.58, 0.60, 0.69, 0.60, respectively. The ESQ will help educators to measure existing skill levels and create or modify teaching methods to develop students' essential job skills to increase success of agriculture graduates in their future careers.

Keywords: essential skills, agriculture, career preparedness, scale development

5.2 Introduction

In recent years the agriculture industry has seen an increase of jobs that are based in communication, business, and technology (Goecker et al., 2015). When students graduate with agriculture degrees today, they will need to possess not only the technical skills for their career but also interpersonal and intercultural skills needed for jobs in those areas. These skillsets are necessary as it is likely that recent graduates in agriculture will be working with culturally diverse groups of people even if they remain in a domestic career (Scott, 2015). Technology and globalization are creating new jobs, and the need for agriculture professionals to excel at essential skills, such as communication, leadership, working with groups and decision-making. Today, there are more available jobs in the agriculture industry than competent graduates ready to fill these jobs (Goecker et al., 2015). Hence, there is a need to recruit students who possess these essential skills, and a global mindset for the agricultural workforce.

Employers seek students with diverse experiences and perspectives. In order to thrive in this diverse environment, graduates will need to possess a strong essential skillset (AgCareers, 2018). An essential skillset includes skills such as communication leadership, decision-making, and others, and are necessary for agricultural graduates to possess, it is often cited that these are the skills most lacking in new graduates (Crawford et al., 2011; Crawford & Fink, 2020). Compounding this issue further, recent graduates may be less likely to effectively utilize these skills in an environment they are unfamiliar with.

In 2011, the Association of Public and Land-grant Universities conducted a comparative analysis of desired soft skills, or essential skills, sought by agricultural industry employers. Seven clusters of these skills were identified and included: communication, decision-making/problem-solving, self-management, teamwork, professionalism, experiences, and leadership skills (Crawford et al., 2011). In a follow-up to that initial analysis, a new study highlighting critical

growth areas for agriculture students was published in 2020. This study recaps the progress made since the initial 2011 analysis and focuses on different stakeholders' perceptions on student level of preparedness in 11 skills (Crawford & Fink, 2020). These 11 skills all fall under one cluster of skills identified in the 2011 study that include: communication, decision making/problem-solving, self-management, teamwork, and leadership. However, throughout this study there were discrepancies in the skills faculty, alum, students, and industry leaders identified as lacking in new graduates (Crawford & Fink, 2020).

It is evident that continued discussions are needed between academia and industry surrounding what specific skills agricultural graduates need and what skills they are bringing to the workforce. While there are steps that colleges of agriculture can take to develop these skills in undergraduates, a measure is needed to track student progress. Therefore, the objective of this study is to develop a self-report measure that can be used to identify student level of essential job skills.

5.3 Methods

5.3.1 Creation of the Essential Skill Questionnaire

The Essential Skill Questionnaire (ESQ) focuses on five clusters of essential skills that were identified as top skills employers want in agricultural graduates entering the workforce. These five clusters of skills include communication, decision-making and problem-solving, self-management, teamwork, and professionalism. Each skill cluster includes six questions to target different aspects of that skill. Questions were created based on research from Crawford et al., (2011) and Crawford and Fink (2020) surrounding essential skills specific to the agriculture industry. The first draft included 30 self-report Likert-scale questions that were reviewed by an expert panel of 6 people comprised of two industry professionals, three faculty members, and one PhD student. Each of the five skill clusters included six questions; three that were coded normally and three that were reverse-coded. After editing based on feedback from the panel, some questions

were adjusted for better clarity. The final ESQ can be found in Table 5.1. Once these adjustments were made, the ESQ was distributed via Qualtrics to a pilot group from one introductory animal science course where students volunteered to complete the scale (N=129; response rate=80%). Students were asked to complete the ESQ during a synchronous online meeting of a laboratory course and were not graded on whether or not they completed the ESQ

Table 5.1 *Final version of the Essential Skills Questionnaire. * indicates reverse coded items*

On a scale of 1-5 (1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree), please rate how much you agree with the following statements.
1. Communication
I struggle to keep my mind from wandering when somebody is talking to me. *
I am comfortable asking questions or asking for help when I am not clear on what I should be doing.
I am able to communicate my ideas confidently, clearly and concisely.
When somebody asks me to complete a task, I can often do it without having to ask them to repeat themselves.
If I don't fully understand what somebody just told me, I often will carry on anyway without asking them to clarify. *
People often ask me to clarify or repeat what I just explained to them. *
2. Decision Making/Problem Solving
I can easily identify problems and analyze them to come up with multiple solutions.
I can see problems that arise but struggle to come up with a solution. *
When making a decision, I think about how this will affect those around me and what consequences may arise from it.
I often make decisions without putting much thought into the long-term effects of the decision.*
When solving a problem, I often think of creative solutions that others may not.
When solving a problem, I often solve it using a common solution. *

Table 5.1 continued

3. Self-management
When I am given a task, I am able to prioritize my time to complete it in a timely manner.
When I am given a task, I know that I have to complete it at some point but am lenient on deadlines *
Working under a strict deadline and with a sense of urgency keeps me focused and motivated on my task.
I feel very anxious when I am working under strict deadlines or in a stressful situation. *
I frequently search for professional development opportunities and opportunities to increase my skill set.
I do not think professional development events are necessary to my success. *
4. Teamwork
When working as a group, I take the initiative to keep everyone involved and communicate with the entire team on a regular basis.
When I am part of a group project, I do my part, but often am not worried about telling the group what I am doing. *
I value the diversity of opinions and different ways of doing things in a team.
When I am part of a group, I am most comfortable completing activities based on my own way of doing things and find it hard to try things in a new way. *
When part of a group, I am an active member, contribute to ideas, and complete the task that is assigned to me.
When part of a group, I know that the project will get done so I don't worry if my part is not completed on time. *
5. Professionalism
When somebody critiques my work, I try to apply it to future situations.
When I am given critiques about my work, it frustrates me and makes me feel like I've failed.*
When I am given sensitive information, I am cautious to not share it with anyone else.
When somebody tells me something important, I struggle not to share it with my friends or family around me *
I am able to adjust my attitude and mannerisms to fit my surroundings.
The setting I am in does not affect how I act or talk.*

5.3.2 Statistical Analysis

SPSS was used to analyze all data for this study. Cronbach's Alpha was calculated to measure reliability between each individual skill cluster and the ESQ overall. Reliability and means are reported.

5.4 Results and Discussion

Results of the ESQ pilot in terms of reliability and means based on a Likert scale of 1-5 (1=Strongly disagree, 2=Disagree, 3=Neither agree nor disagree, 4=Agree, 5=Strongly agree) are shown in Table 5.2. Cronbach's Alpha was calculated for each individual skill cluster to assess internal consistency, and results indicated that each skill cluster had moderate inter-item reliability. This self-report scale suggested that students rate their own level of essential skills between 3.54-3.94 on average. This range indicates that students believe they possess these essential skills, but there is still room for growth. Each skill cluster (communication, decision making/problem solving, self-management, teamwork, professionalism) included six statements that students were asked to self-report on the scale of 1-5 on how strongly they agreed with the statement. Self-report measures come with potential biases such as social desirability bias or response bias (Demetriou et al., 2015). However, it provides evidence that students believe they are functioning well on level of essential skills. This may inform instructors and guide them in tailoring course activities and interventions that target the development of these skills.

Table 5.2 *Cronbach's Alpha, Means, and Standard Error of Means for each individual skill cluster. Means computed based self-report Likert scale where (1=Strongly disagree, 2=Disagree, 3=Neither agree or disagree, 4=Agree, 5=Strongly agree). Students who completed the entirety of the survey are included in analysis (N=129).*

Skill Cluster	Cronbach's alpha	Mean	SE of Mean
Communication	0.71	3.54	0.035
Decision Making/Problem Solving	0.60	3.55	0.034
Self-Management	0.60	3.54	0.091
Teamwork	0.70	3.94	0.035
Professionalism	0.62	3.88	0.033

Going forward, further qualitative data needs to be collected from volunteer focus group participants to gain insight on student thought processes while completing this questionnaire. Collecting student responses would allow us to adjust questions to increase them in clarity and user-ease for participants taking the questionnaire. With the pilot group comprised of a sample of students from one course at a single Midwestern university, more undergraduate participants should be recruited to complete the ESQ to allow for better generalizability and validity of the measure.

In both 2011 and 2020, it was found that employers have specific skills they desire in recent agriculture graduates (Crawford et al., 2011; Crawford & Fink, 2020). Students, employers, recent alumni, and faculty disagree in the skills they believed were most valuable for recent graduates to bring to the workforce (Crawford & Fink, 2020). These studies identify a disconnect between industry and academia that requires further study and conversations between the stakeholder groups. The ESQ was created to serve as a starting place to measure these essential skills in students and to facilitate more of these conversations within academia.

5.5 Summary

Based on this pilot program, the ESQ has the potential to serve as a tool to track student progress on their essential skills. This self-report measure allows students to reflect on their own skill levels and introduces them to the topic of essential skills. Being familiar with essential skills is necessary as these are skills that students will need in their future careers. The ESQ should be used as a starting place to gain insight on students' perceptions of their skill levels and to track student progress in these skills. It is our hope that this tool will encourage courses to incorporate intentional interventions into course curriculum to support students in developing this essential skill set that agricultural employers are seeking today.

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CHAPTER 6. CONCLUSIONS

Embedding intentional intercultural interventions into undergraduate course curriculum is a promising method to develop student intercultural competence (IC). Due to the continued globalization of the agriculture industry, recent graduates of colleges of agriculture will need enhanced interpersonal and intercultural skills to thrive in the workforce. Embedding intentional intercultural interventions into undergraduate course curriculum is a promising method to develop student intercultural competence (IC). . Employers in the agriculture industry seek to recruit employees who have diverse experiences and perspectives, so it is necessary that recent graduates are able to think from more than one point of view and recognize and respect perspectives other than their own. When students enter the workforce with an increased IC, it is likely they will have a stronger overall essential skillset that employers desire in the workforce today.

In the first study (Chapter 2), nine students in a combined learning community-Learning Community study abroad course completed a variety of intercultural learning assignments (ICL) during a study abroad and follow-up in-person course. This cohort of students completed the Intercultural Development Inventory (IDI) at three time points: T1) before their departure on a short-term study abroad course to Italy; T2) At the beginning of the on-campus semester long course; and T3) at the end of the on-campus semester long course. No significant change was seen as a group between timepoints on the IDI, but several students progressed into next stages on the Intercultural Development Continuum, indicating a positive growth in intercultural competence. In addition to assessing IC using the IDI, this cohort was also assessed for development of empathy according to the AAC&U IKC VALUE Rubric (AAC&U, 2009). At the beginning of the semester the majority of students were in either level 1 (N=44.5%) or level 2 (44.5%). However, by the end

of the semester we saw the majority of students in level 2 (N=44.5%) or level 3 (N=44.5%), indicating student growth in empathy development.

Chapter 3 described embedding intercultural interventions in an introductory animal science course to develop undergraduate IC. Students were placed in either an intervention group (N=104) or control group (N=64). Students in the intervention group received five stand alone intercultural learning (ICL) assignments throughout the semester that were unrelated to animal science topics. All students (N=168) completed the IDI at the beginning and end of the semester. At the beginning of the semester, both the control and intervention groups were at a similar level of IC according to the IDI (87.46 ± 2.05 vs. 85.30 ± 1.43). By the end of the semester, the intervention group showed significant growth, increasing an average of 9.46 points on the IDI, while the control group saw no significant change. While students in the intervention group did increase significantly, qualitative responses from students showed that some students in the intervention group struggled to find the relevancy of the material. These students indicated that they saw little value in completing the ICL assignment, so this issue was addressed in the next study (Chapter 4).

Knowing that IC could be increased by embedding assignments in course curriculum, a similar study to the one in Chapter 3 was conducted in the same course the following year. Chapter 4 also observed changes in student IC after completing embedding ICL assignments, but due to COVID-19, the course was conducted using a remote learning format. Students (n=161) were assigned to an intervention (n=93) or control (n=68) group based on their randomly selected laboratory period with all students completing the IDI at the beginning and end of the semester. The intervention group completed five ICL assignments throughout the semester while the control group completed five unrelated assignments. Due to student responses from the study discussed in

Chapter 3, ICL assignments were created to provide relevancy by connecting to global animal science topics instead of being stand alone in the course. Students in the intervention group showed a significant growth according to the IDI with an average increase of 5.77 points. Results from a focus group of six students at the end of the semester suggested that students saw value in completing the ICL assignments and were able to understand the connection to the course material. These results are promising as they showed that even in a remote learning format, embedding intercultural learning into course curriculum and providing relevancy to course material, is one promising way to develop undergraduate intercultural competence.

Chapter 5 builds on the previous three studies in recognition that development of IC may also lead to a development of essential job skillsets that employers want to see in recent graduates. The Essential Skill Questionnaire (ESQ) was created as a way to begin to measure the development of specific essential skills employers are seeking in agricultural graduates. Five skill clusters most often identified by employers as critical for new employees are: 1) communication; 2) decision making/problem solving; 3) teamwork; 4) self-management; and 5) professionalism (Crawford et al., 2011; Crawford and Fink, 2020). Using these five skill clusters, a survey-based instrument that measured essential skill development in undergraduates was created. The ESQ was piloted with a group of 161 undergraduate animal science students with acceptable reliability among each scale item. The ESQ could be a valuable tool for faculty and staff to use to be able to track student progress of these essential job skills desired by employers.

In summary, each study discussed throughout this thesis identified promising ways to develop undergraduate intercultural competence. Specific and intentional interventions are needed to develop student IC. In short-term study abroad programming, it is necessary to provide supplemental activities to increase levels of IC as it is not enough to simply go abroad. We

demonstrate in Chapters 3 and 4 that in a classroom setting, students can increase intercultural competence through stand-alone assignments, but are more interested in them when the assignments are connected to a topic of their interest. It is important to recognize the importance of incorporating ICL into course curriculum. Doing so provides a structured space for students to practice the skills that employers are seeking to recruit for the future agricultural workforce. Future studies should continue to incorporate these models of implementing ICL into other introductory courses. The ESQ can continue to be used as a way of specifically measuring essential skill level in students and seeking any connection between development of intercultural and essential skills.

6.1 References

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