Abstract

Agricultural education undergraduate students lack knowledge and experience with international issues. Although “out-of-country” experiences can improve understanding, they may be too expensive and time consuming for many undergraduates. The use of online simulations can be an effective alternative for providing an authentic international experience. Cognitive gains were documented, but what about a change in attitudes, beliefs, and values (the affective domain of learning)? As a part of a unit on international agricultural development, students were asked to view a simulation called, “Five Minutes in a Developing Country.” In the simulation, students assumed the role of a banana farmer in Peru with a family of four. Upon completion of the simulation, learners were asked to write a one-page reflection paper to describe their reaction to this experience. Content analysis techniques were used by the researchers to analyze students’ affective learning levels: receiving, responding, valuing, organization, and characterization. Through the use of reflective writing the researchers were able to recognize and determine that students did express affective learning at all levels of the original affective taxonomy.
Introduction

Colleges of agriculture are not equipping learners for their role in a global society. Wingenbach, et al. (2003) discovered that agricultural education undergraduate students knew very little about agricultural policies, products, peoples, and cultures and suggested that “out-of-country” learning experiences be used to increase agricultural student’s knowledge. These “out-of-country” experiences are often expensive and limited. A recent study found that an online simulation provided to on-campus learners was effective in providing an authentic international experience (Boyd, Felton, & Dooley, 2004).

Agricultural educators and Extension personnel may be familiar with the three domains of learning: 1) cognitive (Bloom & Krathwohl, 1956), 2) affective (Krathwohl, Bloom, & Masia, 1964), and 3) psychomotor (Harrow, 1972). When teaching international content, the instructional and assessment strategies are typically focused on the cognitive domain of learning because of the difficulty in measuring gains in the affective domain. Very few studies explore the benefits of teaching to the affective domain.

The affective domain includes feelings, values, motivations, and attitudes. There are five major categories: receiving, responding, valuing, organizing, and characterizing (Krathwohl, Bloom, & Masia, 1964). Short writing assignments serve as an appropriate assessment tool to measure changes in attitude (Huba & Freed, 2000). Writing supports learning through the whole-brain processing of doing, depicting, and symbolizing (Emig, 1988). When a learner reflects upon their thoughts and emotions as a result of an instructional sequence, then the nature of the learning process helps the learner to construct meaning from information and experiences. Would reflection and writing about a virtual experience provide evidence of an affective change?

Theoretical Framework

The International Initiative Program through the American Council on Education conducted a national study on experience, attitudes, and knowledge about international education (ACE, 2004). The results indicated that Americans are interested in what happens beyond U.S. borders. There was a belief that international skills and competencies would better prepare individuals to work with diverse cultures and provide a competitive advantage in the workplace. There was support for courses that included an international dimension (ACE, 2004).

Higher education institutions have also surveyed undergraduate student attitudes toward international issues and the value of diversity. Students often agree that they should be required to take a course that focuses on cultural perspectives (Hyer & Collins, 2000). There is a belief that international and multicultural competence is an attitude and skill that employers are seeking. An appreciation of other cultures can be gained through classroom experiences (Hyer & Collins, 2000).

When we think about beliefs and attitudes, we are in a less trodden path called the affective domain of learning. Researchers studying human behavior recognize the need to consider both cognitive and affective dimensions of learning, and their interrelationships (McKeachie, 1976; McLeod, 1991; Vygotsky, 1962). Perhaps the first step on this path is to operationally define these terms. “Affect” is often described with words such as feelings, emotions, motivations, attitudes, and beliefs. Studies have noted relationships exist between
moods and information storage and retrieval (Bower, 1981). There is evidence that affect can directly influence cognition.

Attitudes can be described as “a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence upon the individual’s response to all objects and situations with which it is related” (Allport, 1935, p. 810). Attitude theory contends that the expression of attitude is a social phenomenon and fits within the social constructivist paradigm of learning (McLeod, 1991).

Beliefs can be defined as “judgments of the credibility of conceptualization” (McLeod, 1991, p. 7). Values on the other hand are representations of either positive or negative notions (McLeod, 1991; Rokeach, 1986). Motivation can denote internal states that drive us in a particular direction (McLeod, 1991). Within attribution (motivational) theory, Dweck proposes a framework made up of beliefs and values (1989).

The Taxonomy of the Affective Domain was first developed by Krathwohl, Bloom, and Masia in 1964. This original taxonomy had five levels: 1) receiving when the learner is aware and attending the instructional event; 2) responding when the learner reacts to the instructional event or content; 3) valuing when the learner demonstrates a voluntary commitment to the instructional event or content; 4) organization when the learner demonstrates internalization of a value system; and 5) characterization when the learner consistently acts within the value system. These authors had more difficulty with the terminology and ordering in the affective domain, suggesting that a hierarchical approach may not be appropriate (McLeod, 1991). It was suggested that the affective domain was more dynamic and can best be understood across two dimensions: intensity and stability. “Motivational phenomena would, under this classification system, be considered separately—not as affective states, but as combinatory phenomena that link affect and cognition” (McLeod, 1991, p. 11).

Reflection encourages students to integrate theory with practice. Boud and Walker (1985) define reflection in this way:

Reflection in the context of learning is a generic term for those intellectual and affective activities in which individuals engage to explore their experiences in order to lead to new understandings and appreciations. (p. 19)

Reflection may include the sharing of feelings, observations, ideas, and reactions regarding a learning activity. While reflection can take many forms, reflective writing is often used to get students to delve into subject matter at a deeper level.

Hatton and Smith (1995) identified four types of reflective writing done by students. The first is descriptive writing (not reflective) where the student simply describes the events. Students may begin their reflective writing in this manner to set the stage for further discussion. Unfortunately, some students never get beyond this stage. The next type of reflection uses the student’s personal judgment in reflective description. A student might cite personal reasons for choosing a particular theory or position at this level. In dialogic reflection, students engage in conversation with themselves. The most in-depth level is critical reflection. At this level, the student provides reasons for the event in the broader social, political, or historical contexts.
Several studies have determined that writing could be used to assess students’ level of reflection (Kember, 1999; Wong, Kember, Chung, & Yan 1995). Litke (2002) also found that students in a service learning experience indicated through written reflection that they experienced changes that fall into the affective domain. Participants in their study felt a greater sense of belonging to their group and the community as a result of their activity, as well as a commitment to active citizenship.

Topics presented within an affective framework become very real and relevant in students’ lives (Rompelman, 2002). Reflection-in-action is a form of metacognition in which the student questions both the unexpected event and the knowledge-in-action that brought on the unexpected event. Surprises cause us to reflect on the cause of that surprise (Bruning, Schraw, & Ronning, 1999).

The complexity and dynamic nature of the affective domain provides some degree of difficulty in measuring change as a result of an instructional method or content delivery. Although not an exact science, the original constructs of the affective domain were used to guide this study (Krathwohl, Bloom, & Masia, 1964).

**Purpose**

The purpose of this study was to measure affective learning after viewing an asynchronously delivered simulation, reflecting (metacognition), and writing about the experience. The five major categories of the affective domain were used as the constructs for documenting the level of affective learning.

**Methods**

The data and methods used in this study were a part of a larger research project that has been previously published (Boyd, Felton, & Dooley, 2004). The respondents for this study included 83 undergraduates enrolled in an overview course. As a part of the unit on international agricultural development, students were asked to view a simulation called, “Five Minutes in a Developing Country.” The simulation was developed by international workers with Food for the Hungry International (FHI).

In the simulation, students assumed the role of a banana farmer in Peru with a family of four. This simulation asked students to make decisions that Peruvian farmers must make everyday. The activity involved a decision-making tree where at every turn there were different outcomes. At each stage of the simulation, students made a decision between two alternatives with the goal of improving the lives of the farmer’s family. Students were asked to complete the simulation several times, changing their responses each time to achieve different outcomes. Upon completion of the simulation, learners were asked to voluntarily write a one-page reflection paper to describe their reaction to this experience. Each paper was coded by a number as it was reviewed to ensure confidentiality and will appear in the narrative as a part of the audit trail to authenticate original data sources. This study was approved by the Institutional Review Board.

This study used content analysis within the qualitative research paradigm (Fraenkel & Wallen, 1999). “Content analysis is a technique that enables researchers to study human behavior in an indirect way, through an analysis of their communications” (Fraenkel & Wallen, 1999, p. 405).
Activities to increase credibility for this study included triangulation and peer-debriefing. The narrative descriptions of the data constructs and themes provided sufficient detail so interpretations and transferability decisions can be made by the reader. An audit trail including initial data analysis and compilation of units was kept with each coded writing sample to ensure dependability and confirmability (Lincoln & Guba, 1985).

The constant comparative method was used for data analysis (Lincoln & Guba, 1985, pp. 339-344). This method includes four stages: 1) comparing incidents applicable to each category, 2) integrating categories and their properties, 3) delimiting the construction, and 4) writing the construction. Each reflective paper was read and highlighted individually to determine affective domain levels in the initial stage. A peer debriefing was conducted to check the initial domain levels in stage two. Theoretical triangulation and construction of thick description and representative quote selection provided the framework for the narrative included in the findings.

Results

The affective domain consists of levels that address a learner’s interests, attitudes, values, and appreciation of a given topic or content area. Undergraduate courses that include international content would invariably contain both cognitive and affective dimensions. The interrelationships between cognitive and affective could cause a learner to further internalize the information and possibly promote a change in attitude, belief, and values that would instill a desire to improve the international condition.

_Receiving_ is the first level in the affective domain. Some verbs that describe this level include ask, choose, or view. Simply by choosing to complete this voluntary assignment, all students were at the _receiving_ level of the affective domain.

The next level, _responding_, assumes active participation, attendance or reaction to the content. Action verbs such as answer, write, discuss, or perform reflect the _responding_ level. As an example, one student responded:

_This activity was also interesting because when you made one small decision it would change this family’s whole life for the next few years just on that one decision you made. Before I sent them to the city, they were doing OK on their banana farm, but afterwards, they were struggling in the city considering sending their children to beg instead of staying home to study. Another example is the man makes a simple decision to send his daughter to work and make more money for the family, which will help the family. This leads to less frequent visits from her, and the family ends up resenting him for sending her away._ (9)

It was evident in the reflective writing that all students participated at the responding level. In any classroom setting, one should expect most students to participate at these lower levels. It is much more difficult to assess students at the higher levels of the affective domain (valuing, organizing, and characterizing).

There were indicators in the students’ reflections that the higher levels of the affective domain were present. For example, _valuing_ is the worth that the learner gives to the content.
Action verbs describing this level include differentiate, propose, appreciation for, and concern for. One respondent expressed:

For most of us, the toughest decisions of a day are what to wear, where to eat, or how much to study for a test; decisions for the people like in this activity involve whether or not to send their children out to beg, whether or not to steal to provide money and a living, or whether or not to have more children so that they can help on the farm. (10)

Another student realized that, “I was able to go back and do this over and try a different route to see if there was some way to beat the scenario, but they are not able to go back” (25).

Learners at the organizing level go beyond valuing by demonstrating consistency and priority of their values. Compare, generalize, modify, relate, and synthesize are action verbs that describe this level. This student was able to put himself into the character’s situation, “But if you allow your self to be in the banana farmer’s shoes for a few minutes, forgetting that you’re sitting in a heated house on a computer, you can really see the reality of the situation” (20). Another responded:

While growing up as a child, there was very few of us that would go to bed hungry. Your parents would clothe, bathe, feed and give you shelter. In most families, children won’t start working until the age of sixteen or later. Even later in life, your parents are still there for you and would do anything for you. In these third world countries, you start working from the moment that you can walk. It’s not that your parents are being cruel, but because they had to do it to survive. (13)

Other students noted that “…other people around the world are struggling just to have enough to eat, while we throw away millions of pounds of food everyday” (29), and “Everyday is a struggle for them to live and everyday is a struggle for us to get up. We complain if we have to work a ten hour day and it’s a short day if they work a ten hour day” (25).

Characterizing is the last level of the affective domain. Questioning, demonstrating empathy, solving, and modifying behavior are actions that describe this level. The simulation caused some respondents to question their lives. One student wrote, “Why am I able to go home and have food in my kitchen that I just do not feel like eating and have the ability and the means to go to the store to get something else?” (17). Another student questions, “What would we do if we were in poverty like so many others, and not have the things that we take for granted?” (42). Other students developed empathy for the characters in the simulation. One student stated, “This exercise made me more perceptive and empathetic for those less fortunate. I’ve always been disturbed and disappointed by beggars, especially children. I have never actually considered the fact that they may have no choice” (36). Another student realizes:

Until I did this exercise, I don’t think that I realized the total severity of it (world hunger). I now see how important it would be to have a job in
international agricultural development to help people around the world that work so hard just to get by. (14)

Some students were moved to action by the activity, “This really encouraged me to get involved in any way I can even while still in school to try and alleviate this problem in our world” (5).

Conclusions

After viewing an online simulation, writing samples reflected a change of attitude that was measurable using the levels within the affective domain as the constructs for review. As a result of viewing the virtual simulation, reflecting, and writing about its impact, students expressed affective action verbs such as “feel,” “appreciate,” “motivate,” and “awareness.” They expressed feeling grateful to live in the U.S. and appreciative of the privileges and prosperity that they enjoy. Students were motivated to want to help those in developing nations. Students realized that people in third-world countries are living their entire lives barely able to afford to eat with no hope of any improvement any time in their lives. Their writing expressed an awareness of developing countries and the kinds of decisions people must make and discernment on whether others share their level of awareness. This statement is representative of what most of the students said about the simulation, “It helped me appreciate what I have in my life.”

Through the use of reflective writing the researchers were able to recognize and determine that students did express affective learning at all levels of the original affective taxonomy (Krathwohl, Bloom, & Masia, 1964). Our theoretical triangulation conferred with the original authors that the terminology and levels were difficult to specifically determine. But the researchers have no doubt that affective learning did occur. We support the notion that the hierarchies may not be the most appropriate measure of the affective domain and that further research is needed to create a measure based upon the “dynamic states of being” (McLeod, 1991).

Educational Importance/Implications/Applications

In today’s atmosphere of large classrooms and multiple choice tests, it is very difficult to assess learning in the affective domain. Piaget notes, “at no level, at no state, even in the adult, can we find a behavior or a state which is purely cognitive without affect nor a purely affective state without a cognitive element involved” (as cited in Clark & Fiske, 1982, p. 130). McKeachie emphasized the need to understand humans holistically; cognition and affect should not be separated (1976).

This research demonstrated that reflective writing was an appropriate measure for both cognitive and affective learning. Courses that include an international dimension should consider the use of reflective writing, both as an instructional tool to improve learners’ cognitive models, as well as an assessment tool to measure changes in attitudes, beliefs, values, and motivations.
References


