

ACTIVE LEARNING: THE IMPACT ON STUDENTS PARTICIPATING IN AN EXTENDED FIELD TRIP TO PUERTO RICO

Thomas H. Bruening, Associate Professor

Josue Lopez, Consultant

David F. McCormick, Consultant

The Pennsylvania State University

David R. Dominguez

University of Texas

Abstract

Students in the Penn State course entitled Problem Solving in Tropical Agriculture (INTAG 481) participated in an extended field trip to Puerto Rico. They were interviewed prior to boarding the plane about their expectations and what they had learned at the inception of the semester. The students were randomly selected for interviews. The interviews suggest that students perceived the field trip to Puerto Rico to be a significant and valuable learning experience that could not have been duplicated in the classroom. This direct, hands-on involvement and meaningful exposure to a "real world" situation provided a learning experience students recognized as being both valuable and unattainable within the confines of the classroom. Their learning experience included not only learning the content material but also applying what they learned, developing sensitivity to another culture, and growing personally and professionally.

Introduction

Learning by doing is not a new innovation in education, however, emphasis on active learning is becoming recognized as an important teaching and learning concept for undergraduate education. In fact, according to several authors, the research benefits for active learning in college classrooms is so compelling that it cannot be ignored by college professors (Anderson & Adams, 1992; Chickering & Gamson, 1987; Johnson, Johnson, & Smith, 1991). "Students are simply more likely to internalize, understand, and remember material learned through active engagement in the learning process" (Bonwell & Sutherland, 1996, p. 3).

Traditional apprenticeships of centuries past focused on the apprentice learning from the master through observation, direct instruction, and by directly performing the craft under the master's supervision. The apprentice was actively engaged in learning. But perhaps in this highly technology-engrossed society, higher education curricula designers and developers of

teaching strategies need to rethink the value of active student learning. Participation in learning is a concrete experience that can yield many benefits for higher education (Boud, Cohen, & Walker, 1993).

Educators have seen a re-emergence of interest in experience-based learning in the last 20 years. During this period, much has been written that explores the design, implementation, and benefits of experience-based learning (Boud et al., 1993; Dewey, 1938; Kolb, 1984; Kraft & Kielsmeier, 1995; Svinicki & Dixon, 1994). Discovery learning activities, hands-on learning labs, student-centered in-class and outdoor activities, and field trips are examples of experience-based learning strategies that are used from elementary through higher education. These experience-based activities in the curricula not only provide potentially engaging methods of learning, but they provide opportunities for putting that knowledge into practice. The purpose behind field trips and tours has usually focused on three key elements: (1) concrete observation of phenomena in their natural environment, (2) exposure to people and ideas in their own domain, and (3) the

concept that education and application take place beyond the confines of the "four walls" of the school (Kahler, Morgan, Homes, & Bundy, 1985).

In Figure 1, a modified model originally developed by Bonwell and Eison (1991) is

presented as a framework for this study. This model represents the student activity level and the personal risk students may perceive of their involvement in educational activities.

Lower risk	Students are active with lower level of personal risk Demonstrations, self-assessment, field trips, brainstorming, tests, practicums, projects, laboratory & lecture with discussion.	Students are active with a higher level of personal risk Role playing, presentations, unstructured, dramatization, debate, cooperative learning, & small group presentations.	Higher risk
	Students are inactive with lower level of personal risk Lecture for an hour, show a film for an hour, large group discussion (voluntary participation), & unstructured text-based reading.	Students are inactive with higher level of personal risk Guest speaker of unknown quality, satellite distance education without proctor, random Internet-based reading, unstructured correspondence & chat rooms without monitor.	
Inactive			

Figure 1. A classification model of instructional strategies according to students' risk.

Note. Adapted from Bonwell, C.C & Eison, J. A. (1991).

In this model, students are most inactive when they observe passively or are asked to have limited performance in learning activities. When students are asked to do something they become more active and engaged in their learning. Higher risk factors are associated in this model with personal performance and unstructured monitoring of educational activities.

As noted by Dewey (1938), an experience consists of the interaction between the individual, his or her surroundings, and the situation itself. "An experience extracts previous experiences and then modifies future experiences as a result" (p. 35). In other words, experience-based learning encompasses the learner's personal involvement in a specific experience, typically followed by conscious reflection on that experience. From this, the learner draws logical conclusions, some of which are based on information from others' experiences. The learner, then, can use these conclusions and additional information

from his or her experience to guide their future decisions and actions (Kolb, 1984; Svinicki & Dixon, 1994).

Active experience-based education, though, is more than simply having several student-centered activities in the lesson plan. Experiences can also lead the learner astray (Dewey, 1938):

"The belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative ... some experiences are mis-educative ... Any experience is mis-educative that has the effect of arresting or distorting the growth of further experience ... Everything depends upon the quality of the experience which is had" (p. 25).

If student learning experiences are negative or restrictive, this factor can reduce future positive learning experiences. They can also produce a lack of sensitivity or even decrease students' desire to learn. Equally important, miseducative experiences are typically isolated and unconnected with what the student has done or will do—the exact opposite of what a meaningful experience should be.

In other words, the key to using active experience-based education is having meaningful, high-quality, student-centered educational experiences that connect with the students' prior experiences. The educational value of an experience lies in what the learner takes from it. Examining the learners' perception of an experience is a necessary component of determining the value and effectiveness of an experience-based activity. The underlying belief was that if coursework and the multifaceted student learning activities were properly designed, these factors could foster a high level of active learning within students.

Objectives and Purpose

The purpose of this research was to examine the benefits and impact of an experience-based learning activity from the students' point of view. The objectives of the study were to:

1. Determine the cultural gains, international understanding, and personal development value of the international field trip for students' participating in a course that features multiple active learning components.
2. Draw pedagogical implications from students regarding the use of active learning approaches practiced in the course.

Course Background

Prior to traveling to Puerto Rico, students enrolled in the Penn State international agriculture course titled: *Problem Solving in Tropical Agriculture*. This is an international agriculture capstone course where students gain a working knowledge of basic elements of Participatory Rural Appraisal (PRA)

processes (World Resources Institute, 1990). Most of the students in this course take this three-credit course to complete their international agriculture minor degree requirements.

Prior to the mid-semester travel, each student worked in small cooperative learning groups (3-4 students) to develop background information regarding: (1) Community/government and education, (2) Soil science/agronomy/horticulture, (3) Animal science (domesticated livestock, wildlife), and (4) Community development.

Each student worked in a small group to research technical background information about Puerto Rico, its culture, and agriculture. The students did library research to find answers; they participated with group discussions, developed written assignments, and reacted to readings. These assignments were developed to stimulate learning by transferring responsibility for learning from the instructor to the student. Further, it is believed that multisensory learning enhances the educational process by employing a variety of senses through which students learn more effectively (Boud et al. 1993). Through various forms of information sensing, each individual can be stimulated to retain knowledge (Heinich, Molenda, Russell, & Smaldino, 1996).

Learning In Country

According to Kraft and Kielsmeier (1995), the school experience should resemble the real world as much as possible. Theoretically students should learn how to work and solve problems together, because that is how adults really live and work. The instruction and teaching and learning activities for the course was developed using the PRA method of needs identification. This method of needs identification is used extensively throughout the world to help individuals prioritize the most pressing development problems (Chambers, 1989). While in Puerto Rico, students engaged in a number of learning activities to extend their work initiated in class. They simulated a PRA, worked with government agency professionals, collected data, interacted with local people, and experienced cultural differences. While in Puerto Rico, the students:

- Explored contextual information
- Explored biodiversity of natural systems
- Collected spatial, demographic, and historical data
- Discovered cultural nuances
- Engaged in Participatory Rural Assessment
- Worked with local agricultural; agency professionals
- Interacted with local people, farmers, and citizens

These experiences all fall within three active learning sections of Dale's *Cone of Experience* (1946). The students participated in direct purposeful and contrived experiences, as well as demonstrations, study trip, exhibits, and visual and verbal symbols. Each aspect of the in country Puerto Rico learning activities incorporated one or more of these experiences into an active learning opportunity for students in the class. Dale (1946) argued that abstract symbols and ideas, if built on direct-purposeful experiences, would be more easily understood and retained by the learner.

Learning Processes

Students were involved with a number of learning activities to stimulate their active learning in this course. Students learned by way of lecture, field-based data collection, development of their own knowledge of Puerto Rico, and personal interaction with local farmers prior to the field trip. This last step was to orient students to the information-gathering portion of the course.

Students in cooperative learning groups wrote about Puerto Rico after they collected information from the library, university professors, popular press articles, the course learning packet, and sources of information from the Internet. According to Heinich et al, (1996), combining visual and auditory presentations in class provides teachers with tools to engage students powerfully in the learning process.

After returning to Penn State, the students:

- Analyzed collected information
- Developed a videotape presentation
- Wrote a final report

- Gave a presentation to faculty
- Developed a WWW site
- Developed a PowerPoint presentation

After completing the PRA in Puerto Rico, students again worked in groups to share their experience and to further reinforce their learning by teaching others. These levels incorporate interviews, collection of data, video presentation, written presentation, verbal presentations and electronic presentation utilizing PowerPoint software.

Methods

The research methodology used to collect and analyze the data was qualitative. The approach used to conduct the research was a single-case study design using intact groups. According to Stake (2000) a concentrated inquiry of a specific phenomenon constitutes a case study. The same research protocol was used over the duration of the study to increase reliability (Yin, 1994). Yin also indicated that the real-life context of a case is useful in deriving a holistic understanding of a particular system. To maintain the validity of the study, multiple years of evidence were collected from the course participants (Mulenga, 2001).

The Pennsylvania State University course, "Problem Solving in Tropical Agriculture (INTAG 481)," that included an extended (10-day) field trip to Puerto Rico was the real-life context for case study inquiry. The extended field trip was designed to provide students with direct experience in conducting the PRA process and to provide them with experience working with agriculture professionals in a culture different from their own. Several teaching professionals (2-4 per year) assisted the course but one key professor was consistently with the course for all three teaching semesters. While the curricula were modified slightly to meet the conditions and needs for each unique group of students (the experiences and background of the students for each course), the course was primarily the same content each year. However, there was a slight modification in

the spring of 2000; there was more emphasis placed on rural development and less on production agriculture.

The PRA process is a step-by-step procedure that is conducted by a multi-disciplinary team (in this case students and teachers) with community residents and local agency personnel (World Resources Institute, 1990). One goal of a PRA is to collect information rapidly from rural communities so that this information can help local groups quickly identify, then help them solve their own problems. The students' overall goal in Puerto Rico was to initiate and facilitate a modified nominal group process and lead the discussion between local farmers and the local agency personnel. The purpose of a nominal group process is to rank issues of local concern. The objectives of the course were to determine the needs of both the farmers and agency personnel regarding the options for sustainable rural development (INTAG 481 course materials). In preparation for the PRA in Puerto Rico, students practiced the data collection techniques with farmer interviews in Centre County, Pennsylvania, near the University Park campus of Penn State.

Thirteen students in 1996, 14 in 1998 and eight in 2000 were registered for the course and the field trip to Puerto Rico. Following eight weeks of campus-based instruction, the group of students and professors traveled to Puerto Rico for the 10-day field trip. There, they visited local extension offices, toured several farms, and conducted the PRA process with a select group of local farmers and agricultural professionals.

Interviews were conducted with 15 students (six from the class of 1996, five from the 1998 class, and four from the group of students in 2000). The students were randomly selected and they were interviewed just prior to traveling to Puerto Rico and one-week after returning. Each of the interviews lasted approximately 30 minutes. Despite the small sample size, the research team determined that with randomization--bias would not be a threat and no real benefit would result from interviewing all students.

Results and Discussion

The purpose of the pre and post-experience interviews was to explore the students' expectations of the international experience, their perceptions about interacting in the new culture, and their perceptions regarding the educational value of the experience. These questions also attempted to discern the knowledge gained in the course and self-revelation of student attitudes toward international concepts. Pedagogically it was hypothesized that it would be beneficial to analyze this information and to discuss the value of the international experiences as a vehicle in helping students become more active learners.

Pre-experience Responses

Pre-trip interviews were conducted to develop base-line information regarding the students' previous international experiences, perceptions about the upcoming international experience, and expectations students had about learning more about another culture. While it is obvious that Puerto Rico is part of the U.S., it is also clear that traveling and working there constitutes a cultural experience that many U.S. students would contend exceeds English-based international experiences. When asked about their previous international experiences, some of the students had traveled to Spain, Jamaica, and Costa Rica and one had lived in Italy. A few students had traveled across the border to Canada or Mexico, but most of the students had very limited international experience. For some it was their first plane ride and for most it was their first travel experience outside the continental United States.

Students were asked the reasons for taking the course. The most frequent response was that the course was a requirement for the minor in International Agriculture. For other students it was the opportunity to experience "real world agriculture."

Students expressed several expectations, which related to their desire for a "real world experience." Of primary importance to the instructors at the beginning of the

course was the direct application of what students were learning in the classroom and their ability to apply this knowledge directly in the “field.” This was also important to students as they had “practiced” the PRA technique on farmers in Pennsylvania and they also knew they would need to conduct the PRA in Puerto Rico. Additionally, students expected to learn more about land use, natural resources, agriculture, rural development, cross cultural communication, and the Puerto Rican people themselves.

When the students were asked to explain cultural learning expectations and cultural differences, students enthusiastically responded to the challenge. One student commented, “Culture is something to be enjoyed by both sides.” Regarding preparedness, students felt they were prepared for the trip but as a whole expressed some uncertainty about the actual application of the PRA.

In general students were excited and were looking forward to the experience. The positive outlook toward the experience and the enthusiastic attitude set a firm foundation for a meaningful and educative experience.

Post-experience Responses

The post-experience interviews were conducted with the same students who participated in the pre-experience interviews. These interviews were conducted one-on-one within one week after returning from Puerto Rico. The week delay was used to allow students the opportunity to assimilate and reflect on their experiences.

All students interviewed indicated the international experience was a valuable learning experience. The PRA process, Puerto Rican agriculture, people they interacted, with and the culture contributed to the learning experiences. However, students had mixed responses for the PRA and Puerto Rican agriculture. Most students commented on how effective the PRA was used to collect information and the seriousness of the farmers’ and the agents’ reception. One student commented on the PRA and stated, “I think that going through the learning activity and conducting the PRA and having it be that successful was a

big-time learning experience.” However, several students commented that “the PRA did not run as smoothly” as they expected. As a result, a few of these students felt that they learned something about the unpredictability of international work and the need to remain “flexible” while working across cultures. Flexibility in working in cross-cultural situations and internationally is a key concept that is taught within the course.

A few of the students were surprised by the advanced state of Puerto Rican agriculture. In addition, some of the students recognized the different problems Puerto Rican farmers have in obtaining agricultural credit compared to Pennsylvania farmers.

Several students indicated that the experience increased their interest in working internationally. Students also mentioned that the experience increased their awareness of the importance and need to understand the local culture when working internationally including the recognition of all the possible communication and cultural barriers that exist. As expressed by one student, “You have to deal with people on a very culturally unbiased level. You almost have to become socialized to their culture before you can understand them and their situation.” Several of the students expressed an interest in learning or relearning Spanish or another language as a result of the experience. Several students mentioned that they were impressed by how receptive, open, and friendly the Puerto Rican people were. “I learned that their culture is much friendlier than ours and their way of life is much more relaxed.” A number of the students commented on the value of their positive interaction of the Puerto Rican people. One student summed it up by saying, “We learned something from them and they learned something about us.”

When students were asked what they gained from the experience that they could not have gained from staying in the classroom, the common response centered on being able to see and experience everything first-hand. While this observation may seem obvious, students indicated that for international situations—

being able to see and experience the culture and life-conditions first-hand was invaluable. Increased understanding of the variety of problems in international agriculture, increased appreciation for culture and cultural differences, and a meaningful experience with the PRA were mentioned as benefits. One student said, "the trip to Puerto Rico provided a frame of reference; foundational information from which I can look at things that are presented in class and then look at the real situation." Another student felt that, "We could not have learned as much doing it here [at Penn State]."

Along with the opportunity to learn about agriculture and the Puerto Rican culture, several of the students mentioned that they encountered new dimensions of their own personal characteristics that previously had been unknown. For example, one student commented that, "I now realize that I can be more independent than I ever thought." And continued by saying, "the trip was valuable both as learning experience and a personal development experience." Other students commented on their personal preoccupation with time. This became increasingly evident over the stay as they learned how dependent they were to schedules and in contrast how little Puerto Ricans place on the measurement of time.

Students also commented on the realization of their respect for other people. A student stated, "I learned that I have a deep respect for other people. I mean I already knew that...it was just amplified."

Throughout the post-experience interviews the students expressed more confidence in themselves, a satisfaction of completing an interesting activity and completing their objective. This was expressed in comments such as: "I made a big step towards being confident in my career." Another student stated, "I never thought that I was an independent person whatsoever, and I am now." This confidence seemed to originate from the students' expressed sense of accomplishment of having been in a challenging and unfamiliar "real world" working situation and having returned feeling that they had accomplished

something that not only they perceived important but the "clients" also valued. These comments tend to support the idea that students benefit from international experiences in a meaningful way.

Summary and Implications

This was a limited examination of students' perceptions of an international field trip experience to Puerto Rico. Overall students indicated that the experience was important, valuable and meaningful to them and their professional and personal lives. The importance can be derived not only from the direct, hands-on work the completed simulating working professional roles, but also the value the students expressed about the immersion into the culture and enjoyment in working with the Puerto Rican people. One student noted that the experience was valuable because it was a shared experience and new friendships were formed both with fellow students and with the Puerto Ricans.

It is evident in the comments made by students that they learned much as a result of the entire experience. Most of these experiences gained in this situation are not possible to simulate in a classroom at Penn State. Being awakened by a chicken crowing outside your window, smelling the orange blossoms at the Arecibo Experiment Station, then learning the importance of citrus to Puerto Rican farmers, straining to climb the steep slopes of a plantain field, and making a positive human connection with a person unlike yourself -- all of these experiences have meaningful life-long learning benefits. These directly transferable cognitive, psychomotor, and affective activities are rich learning opportunities for the individual because they were experienced and personal. The value of this active experiential based learning is not unexpected as others have documented its value to students previously (Boud et al. 1993; Conrad & Hedin, 1995; Roland, Wagner & Weigand, 1995).

Students indicated that they were prepared for the breath of their experience. Prior to traveling students were responsible for teaching their peers about a specific aspect of the Puerto Rico (for example,

research on animal agriculture in Puerto Rico). This peer teaching contributed to their positive attitude and their ability to gain cognitively from the experience. The preparation prior to and the guidance during the experience can significantly contribute to the quality of learning experience (Jenks & Murphy, 1981; Williamson, 1995).

The scope of this project included only the perceptions of about half of the students who participated. However, informal discussions from the non-surveyed students yielded similar responses. Perhaps if conducted again, it would be valuable to get responses from all of the participants. Additional studies could attempt to determine perceptions of teachers and professors. Analyzing the impact of active experiential based learning could include impact information from students, professors, and clients since the learning activity should be a learning activity for all involved.

Admittedly, this was a select group of students. Because they were in the international minor they self-selected into a category of students more likely to be stimulated and interested in active cultural learning. At the same time, some universities are increasingly using international courses to meet university diversity requirements. With this in mind, this model of education could be an effective strategy not only to meet the requirement but also to enable effective learning to occur in a content area that some students struggle to see as beneficial.

Dewey (1938) and many others have indicated the quality of the learning experience is important. This includes the students' perceptions of the quality of the learning experience not solely the educators' intent behind the activity. Properly facilitated learning through direct meaningful experiences is known to have direct and lasting benefits to the learner (Conrad & Hedin, 1995; Jernstedt, 1980). It appears that students more easily recall the sensory provoking activities gained through first-hand experiences rather than through vicarious activities. Based on this project, the INATG 481 course is such an example of an experientially based learning opportunity for students. As expressed by

the interviewed students, their learning experience included not only learning the course content, but also the application of that content through actual practice and then writing and developing final reports. As they taught others what they had learned about another culture, it was beneficial as a pedagogical reinforcement but also the students grew both personally and professionally. While not all courses can or should travel internationally to stimulate active learning, there are a number of teaching strategies used in this course that could be incorporated into any course to stimulate active learning.

References

- Anderson, J. A. & Adams, M. (1992). Acknowledging the learning styles of diverse student populations: Implications for Instructional Design. In Border L. B. and Chism, N.V. (Eds.), *Teaching for diversity. New Directions for Teaching and Learning, No 49.* (pp. 19-33). Jossey-Bass Publishers. San Francisco, CA.
- Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom. ASHE-ERIC Higher Education Report No. 1.* Washington, DC.
- Bonwell, C.C. & Sutherland, T.E. (1996). The active learning continuum: Choosing activities to engage students in the classroom. *Using Active Learning in College Classes: A Range of Options for Faculty. New Directions for Teaching and Learning, No. 67.* (pp. 3-16). Jossey-Bass Publishers, San Francisco, CA.
- Boud, D., Cohen, R., & Walker, D. (1993). *Using experiences for learning.* Buckingham: The Society for Research into Higher Education & Open University Press.
- Chambers, R. (1989). *Farmer first: Farmer innovation and agricultural and agricultural research.* London: Bootstrap Press.
- Chickering, A.W. & Gamson, Z.F. (1987). Seven principles for good practice. *AAHE Bulletin, 39,* 3-7.

Conrad, D. & Hedin, D. (1995). National assessment of experiential education: Summary and implication. In R.J. Kraft & J. Kielsmeier (Eds.), *Experiential learning in schools and higher education*, (pp. 382-403). Boulder, CO: Kendall/Hunt Publishing Co.

Dale, E. (1946). *Audio-visual methods in teaching*. New York, NY: Dryden Press.

Dewey, J. (1938). *Experience and Education*. New York: Macmillan Publishing Company.

Heinich, R., Molenda, M., Russell, J. D. & Smaldino (1996). *Instructional media and technologies for learning*. Englewood, NJ: Merrill.

Jenks, C.L. & Murphy, C.J. (1981). *Experienced-based learning and the facilitative role of the teacher*. San Francisco, CA: Far West Lab for Educational Research and Development.

Jernstedt, G. C. (1980). Experiential components in academic courses. *Journal of Experiential Education*, 3(2), 11-19.

Johnson, D.W., Johnson, R.T., & Smith, K.A. (1991). Cooperative learning: Increasing college faculty instructional productivity. *ASHE-ERIC Higher Education Report No. 4*. Washington, DC: School of Education and Human Development, George Washington University.

Kahler, A.A., Morgan, B., Homes, G., & Bundy, C. (1985). *Methods in adult education*. Danville, IL: The Interstate Printers and Publishers.

Kolb, D.A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.

Kraft, R.J. & Kielsmeier J. (1995). *Experiential learning in schools and higher education*. Dubuque, IA: Kendall/Hunt Publishing Company.

Mulenga, D. (2001). Case study research. In E.I. Farmer & J.W. Rojewski (Ed.), *Research Pathways* (pp.129-156). Lanham, MD: University Press of America.

Roland, C.C., Wagner, R.J., & Weigand, R.J. (1995). *Do it.... and understand!: The bottom line on corporate experiential learning*. Dubuque, IA: Kendall/Hunt Publishing Company.

Stake, R. E. (2000). *The art of case study research*. Thousand Oaks, CA: Sage Publications, Inc.

Svinicki, M.D. & Dixon, N.M. (1994). The Kolb Model modified for classroom activities. In Feldman, K. A. & Paulsen (Eds.), *Teaching and learning in the college classroom*, (pp. 307-315). Needham Heights, MA: Ginn Press.

Williamson, J. (1995). In Kraft, R.J. and Kielsmeier (Eds.), *Experiential learning in schools and higher education*, (pp. 26-31). Boulder, CO: Kendall/Hunt Publishing Co.

World Resources Institute. (1990). Participatory rural appraisal handbook: Conducting PRAs in Kenya. *Natural Resource Management Support Series-No. 1*: Washington, DC: Center for International Development and Environment of the World Resources Institute.

Yin, R. K. (1994). *Case study research: design and methods*. Thousand Oaks, CA: Sage Publications, Inc.