

Influences of Field Immersion, Disciplinary Projects, and Extra-Disciplinary Activities on Transformative Learning in an Experiential Learning Project

Radha Pyati, Ph.D.

University of North Florida

April Moore

University of North Florida

Abstract: This paper presents a case study of an experiential learning project, an analysis of its transformative learning effects, and a description of the aspects most influential on transformative learning. The project is an eight-day houseboat excursion with students at the University of North Florida. Student work products were evaluated for evidence for transformative learning. The most powerful factors causing transformative learning were the experiential aspect of studying in the field, projects done strictly within a student's major discipline, and extra-disciplinary projects done intentionally outside a student's major discipline.

Keywords: experiential education; transformative learning; environmental education; field immersion; disciplinary studies; extra-disciplinary studies

Radha Pyati is Associate Professor of Chemistry at the University of North Florida. She served as Director of the UNF Environmental Center from 2008 to 2013. She is an analytical chemist with interests in environmental chemistry. She may be reached at radha.pyati@unf.edu.

April Moore served as Coordinator of the UNF Environmental Center from 2006 to 2012. She currently teaches science in the St. Johns County School District, Florida.

Transformative learning has been established as a powerful element of educational experiences. Mezirow defines transformative learning as an event in which "... we reinterpret an old experience (or a new one) from a new set of expectations, thus giving a new meaning and perspective to the old experience" (Mezirow, 1991). His later work elaborates upon this idea, stating that in a transformative learning experience, "... we transform our taken-for-granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive, discriminating, open, emotionally capable of change, and reflective..." (Mezirow, 2000). Transformative learning also "involves participation in constructive discourse to use the experience of others to assess reasons justifying these assumptions" (Mezirow, 2000), and moves between cognitive, rational modes and emotional, intuitive modes (Grabove, 1997).

Experiential approaches offer great potential to create these sorts of changes in worldview and perspective. Experiential learning has been shown to generate a transformational understanding of sustainability in students (Ripple, 2010). As well, the importance of transformative learning to addressing environmental issues has been described (Rathzel & Uzzell, 2009; Sterling, 2010; Walter, 2013).

Within experiential programs, multidisciplinary or interdisciplinary academic projects have been of great interest. Interdisciplinary programs have been demonstrated to increase interest in the environmental humanities (Alagona & Simon, 2010). Multidisciplinarity has been found to expand the traditional pedagogical approach to environmental education to include pedagogies outside the natural sciences that are relevant to environmental literacy (Cole, 2007).

This paper is an exploration of the transformative impact of a specific experiential program: a nine-day houseboat trip and academic experience for University of North Florida (UNF) students led by the authors on the St. Johns River, Florida, USA. Students are immersed in the river's ecosystem and history, and sustainability of both the river system and the patterns of everyday living on the houseboat are central elements of the experience.

In this study, we queried whether transformative learning occurred in this project, and if so, which aspects were essential and what role was played by the experiential or field element of the program. We argue here that the St. Johns River experience did effect a transformation among students, and the most influential factors causing this transformation were the field immersion itself, the disciplinary project undertaken by the student, and the intentionally extra-disciplinary activities in which they participated. Extra-disciplinary work in this paper is defined as work outside a student's major academic discipline. The sample size in this study was very small, and quantitative conclusions were not made; thus the results are not generalizable. However, the elements essential to the success of this program are common to many experiential education projects, and the impact of those elements in this particular case is instructive.

St. Johns River Multidisciplinary Transformational Learning Opportunity (TLO)

Since 2007, the UNF Environmental Center has coordinated the St. Johns River Multidisciplinary TLO. On the TLO, up to ten students reside and conduct research on a houseboat for nine days during spring break on the Middle Basin of the St. Johns River. Students

visit state parks, springs, and other points of natural and historical significance. They hear from river experts, such as authors, historians, scientists, engineers, artists, and musicians. Students also assume support roles required for smooth operation of the trip, such as food manager or scientific equipment manager, and assist with boating operations as needed.

Academic activities consist of an individual project for each student and a group project shared amongst them. Students may choose to earn credit for the TLO; usually less than half do so, with the individual project as the avenue for credit. The individual project is designed by the student prior to the trip, with assistance and accountability provided by a faculty or staff mentor. A final deliverable is required, such as a scientific report, a research paper, or a completed series of artistic works. Students also conduct a group project, such as a journal, a sketchbook, a video, or an opinion piece. During the trip, students present projects to their peers and participate in both scheduled and spontaneous discussion. The required text is *River of Lakes: a Journey on Florida's St. Johns River* (Belleville, 2000).

Sustainability is an essential component of this experiential learning project. The key intellectual concern of the trip is sustaining the St. Johns River, or understanding the context that keeps its ecosystem healthy and its regional economy viable. An essential part of this context is an exploration by students of cultural and social issues surrounding the river. As well, students are required to live sustainably on the houseboat. They are continually aware of their limits on drinking water, washing water in the freshwater holding tank, space in the sewage holding tank, and gasoline to power the electrical generator.

Methods

This study is an analysis of a small sample of four types of student work products: group projects, individual projects, pre-trip assessments, and post-trip assessments. Its methodology is qualitative and its conclusions are not considered generalizable. However, the student work products contain not only traditional expository writing on academic projects, but also richly descriptive expressions of their thoughts and feelings. Analysis of these items yielded an aggregated understanding of the experience.

A total of five group projects were analyzed: one for each year. In 2007 the project was a video, in 2008 it was a shared journal kept on a laptop computer on the boat, in 2009 it was a collaborative paper envisioned as a potential opinion piece, in 2010 it was a sketch journal, and in 2011 it was another opinion piece.

Individual projects were conducted by students generally on projects within their own discipline. A small number did these projects for academic credit; most did not. Compliance with conducting an individual project presented challenges for students not earning a grade for the project. But over the years, the leaders' strategy for ensuring compliance improved. In 2010, the leaders required a two-page paper to be completed on the computer by the last day of the trip. In 2011, the leaders required three short writing pieces on the project during the trip; the last of these was the completed project. A 2011 syllabus appears in the Appendix.

Pre- and post-trip assessments consisted of questionnaires given before and after the trip; assessment forms appear in the Appendix. The post-trip assessment changed over the years; in 2008 the before-after question was more detailed and asked about student perceptions of the history and culture of the St. Johns River region.

All these student work products were analyzed for their content. The central theme of the analysis was seeking description of transformation, or lack of transformation. Student work was examined for references to productive discourse, as well as changes in perspective, point of view, approach, or any other expression of attitude or knowledge that would reflect a transformation as defined in this paper. This analysis uncovered several common key phrases written by students in their work. As well, when students were directly asked about the extent of their transformation, nearly all described their transformations; only one student stated that the experience did not transform her. Clearly this report of changes was self-reported by students. But implicit transformation was also queried in the study of student work product. Language about conducting disciplinary or extra-disciplinary work differently than before was also considered evidence of transformation.

Results

A total of 38 students participated on five trips. For the 2007 trip year, only the group project was available for study. For the other four trips (2008-2011), analysis was conducted on the work product of a total of 29 students. In total, the datasets consisted of five group projects, eighteen individual projects, and 22 pre-trip assessments, and 20 post-trip assessments.

The first question addressed in the analysis was whether or not transformation occurred. Examination of the datasets provided the answer to the first question that transformative learning did occur. Both productive discourse and increased openness to new ideas resulted, at least as self-reported by respondents. The post-trip assessment indicated that 90% of respondents answered affirmatively to the question “During the trip, did you have the opportunity to present, debate, reconsider, and justify your opinions?” 100% of respondents answered affirmatively to the question “Did this TLO make you more open to other ideas, situations, people and cultures?”

Further confirmation that transformative learning occurred appears in numerous open-ended responses and passages from student work products. Students expressed a use of new experiences to interpret old or new ones, or a change in frames of reference. One described herself as “forever changed.” Another used a lengthy journal entry to record each stage of an internal back-and-forth dialogue about her future, informed by the week’s experiences.

These expressions were also studied in order to answer the other questions about the elements of the trip most central to transformation, and the role of field immersion. The most essential aspects for effective transformational learning were three elements: field immersion, disciplinary assignments, and intentionally extra-disciplinary activities.

Field Immersion

Field immersion was one of the most effective aspects. The experiential aspect of the trip effected personal transformation that was often very place-based. Student comments frequently mentioned a new perspective on Florida, the St. Johns River, the American South, or Florida residents. One student wrote, "I view the St. Johns River in a much more intimate way." Another wrote, "Florida has some true and unique culture that most people are unaware of." Other students expressed similar thoughts and feelings. The trip seemed to impact their attitudes toward Floridians from "all walks of life," i.e., a variety of cultural backgrounds, social classes, and occupations. The most unusual personal, place-based transformation was a student's expression that her attitude toward lifelong Florida residents had changed: that previously she had viewed negatively the people who had never left Florida throughout their lives, but that after the trip, she felt that they were "lucky to have such a wonderful resource in their backyard (the river)."

The field immersion aspect was important not only in terms of students' personal transformation, but also as a vital piece of the impacts of the disciplinary and extra-disciplinary projects on the trip. The fact that students were required to conduct academic projects away from a traditional academic space forced them to adapt their work to current conditions and broaden the focus of their inquiry.

Disciplinary Projects

Disciplinary activities provided another critical avenue to transformation. Student disciplinary work included a variety of projects across disciplines. Some were natural-scientific in nature and involved conducting experiments on river water or observations on organisms and landforms in the habitat. Others were social-scientific and involved personal interviews on the trip as well as internet and library research. Yet others were artistic or humanities projects involving direct exposure to aesthetic or interpersonal experiences on the trip.

These disciplinary projects provided pathways to transformation that fell into three broad categories: making new connections between the river and a student's discipline, comparing field versus laboratory science, and experiencing direct interaction with people or places instead of indirect knowledge of them through reading or other study.

Making new connections between the river and a student's discipline was a common theme in many projects. The social science majors' final projects made direct connections between the river and its management aspects as described by several federal and state agencies, laws, and statutes, as well as public opinion about the river noted by newspapers, magazines, and other general-interest media outlets. The science majors made copious water quality and aquatic life observations, only to realize that summarizing the health of the St. Johns River was an unwieldy task involving several variables of climate and season. The engineering majors described the relationships among water quality and flow, hydrological consequences, and development regulations. These three are the clearest examples of the connections students described making between their academic discipline and the river. These connections were transformative in that they viewed the academic content learned in their discipline through a new lens. They gained first-hand knowledge of how problems considered individually in the classroom or laboratory interact through several influential forces in a real, complex system. This new lens is a characteristic of transformative learning.

The second aspect of disciplinary projects that yielded a change in perspective was the reality of making scientific measurements in the field instead of the laboratory. Several students were required to design field-expedient experiments to observe a property of the natural environment. Although instrument calibration was done prior to the trip when resources permitted, often calibration had to take place on board, with limited glassware, reagents, and laboratory equipment. Some parameters could not be measured with equipment available to the instructors, so students designed simple experiments to measure those parameters. Students learned to adapt to field conditions and conduct the best experimental work possible. They also gained a new point of view on the importance of making measurements under well-understood conditions, and on the relevance of their measurements to a real-life natural system. One student commented that using a uniform one-meter submersion depth for an underwater sampling probe worked in every sampling location but one, at which the measurement was very hard to make due to large amounts of filamentous algae covering the probe. Another student found that turbidity measurements made using a Secchi disk displayed significant variability in the field due to the sunlight conditions of the day. Both of these examples illustrated to students the contrasts between laboratory and field science, and both changed the students' perspective on how a field measurement is planned and executed so that it yields a meaningful result.

Finally, several disciplinary projects involved interacting with people or places directly instead of through indirect study. Numerous students, in social-science or humanities disciplines, conducted interviews with people met during the trip: not only the speakers invited to talk with students on the trip, but also random individuals approached at attractions or restaurants the students visited. Students regularly exhibited a willingness to engage strangers and ask important questions about how those people felt about the river. These interactions provided another important avenue for transformation through disciplinary activities. One student noted that he had previously understood river issues via local media sources, but the trip enabled him to talk with people living on the river, and he observed, "their input is invaluable, because sometimes media outlets leave out opinions such as theirs." This direct interaction with people living on the river was a crucial element of the transformative nature of this disciplinary project, because it synthesized the student's earlier understanding from local media with new information from direct interpersonal interactions, forging a new perspective.

Extra-Disciplinary Activities

The third aspect of the experience that proved effective for transformation was intentional extra-disciplinary activities. Students were required to include their boatmates on project activities, so nonscience majors were continually involved in water sampling and analytical chemical measurements using both test kits and instrumentation. As well, the art and music day required students to select a visual art medium from among watercolor, pastel, pen-and-ink, or oil painting, receive instruction from an artist in that field, and execute an artwork. These activities had a strong effect on the students. One nonscience major was awed by her direct observation of a chemical reaction. Numerous science majors remarked upon seeing the river and the natural environment very differently after having to represent it visually in an artistic medium. One noted, "the time spent with the artists helped me to stop approaching everything in the same way, but to step back and take a look before jumping in." This was an example of a

change in perspective and a shift in frame of reference. Another physical science student relished discussion with the social scientists the most. He observed that he generally viewed things from a “what cost the least and has the best intended effect” perspective, and he felt the discussions with social scientists were quite different because they revealed “how humans and everything in nature are all intertwined.” A social science major noted that making water quality measurements with a physical science major “helped me [sic] understand the effects of pollution on different parts of the river.”

Finally, student outcomes are an anecdotal way of observing transformation, or at least a changing of course, that is not a self-reported emotion or thought, but instead is a set of actions. Following these trips, several students have initiated involvement in environmental projects, ranging from fieldwork in biology to organic gardening to internships with the regional water management district.

Discussion

This paper presents the argument that, for a specific experiential activity, transformative learning took place, and that the most effective aspects of the experience were field immersion, disciplinary projects, and extra-disciplinary work. The fact that both disciplinary and extra-disciplinary projects had such influence suggests that in fact, in this case, the dichotomy of rigorous disciplinary thinking and extra-disciplinary adoption of new ways of knowing was the most productive avenue toward transformative learning in this case. This emphasis on exposing students to different ways of knowing is nothing new: it drives most if not all undergraduate academic programs to include general education requirements encompassing the natural sciences, humanities, and social sciences. But the experiential combination of multiple ways of knowing is a powerful educational tool, in which the learner seeks a new unified understanding forged from multiple disciplines.

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Appendix.

Pre-Trip Assessment, St. Johns River Transformational Learning Opportunity, University of North Florida.

1. What is your N-number? (This is a unique identifying number used at UNF).
2. What was your first impression when you heard about this travel course? (Please be as specific and extensive as possible. This will be used as qualitative data in our manuscript, so a response like, "It sounded cool," would not be the type of response we would be looking for from a scholar such as yourself.)
3. Have you ever participated in a course like this before? If so, please share the course(s). If not, why do you think you have not? (Again, "not enough time" is not the type of response we would be expecting from students of your caliber.)
4. How do you think this course will affect you? Academically – Professionally – Personally – Globally – etc.
5. If you could add one thing to this course, what would it be and why?

Post-Trip Assessment, St. Johns River Transformational Learning Opportunity, University of North Florida.

1. Please list your N-number.
2. How well do you think connections between the St. Johns River and collaboration among students from diverse academic backgrounds were accomplished? Can you provide at least one example?
3. Did you have a student product that resulted from this TLO that you can use to indicate the success of your project and the extent of your transformation?
4. Before the trip, how well did you understand the conflicts surround issues with the St. Johns River?
5. After the trip, how well do you now understand the conflicts surrounding issues with the St. Johns River?
6. During the trip, did you have the opportunity to present, debate, and reconsider and justify your opinions?
7. In what projects were you involved during the trip that relate to your discipline?
8. In what projects were you involved during the trip that related outside your major discipline?
9. How well do you think the trip and the group meetings before the trip promoted intercommunication among group members?
10. Did this TLO make you more open to other ideas, situation, people and cultures?
11. Do you participate for academic credit?
12. What was your first impression when you heard about this travel course?
13. Please share any experiences that you have had participating in a course like this before?
14. How do you think this course will assist your career?
15. If you could add one thing to this course, what would it be and why?
16. Are there any lessons you have learned that you might recommend to modify the TLO in some fashion in the future?

TLO Academic Activities – Individual Projects and Required Text – Spring 2011

Each student on the trip will participate in several academic activities.

1. Group project agreed upon by students in advance of trip, selected from menu of choices and approved by trip leaders
2. Individual project based upon their individual academic discipline
3. Response to required text *River of Lakes*

Items 2 and 3 are addressed here.

Writing Assignments

Students will write several short pieces during the course of the trip to be shared during group discussion times. Each short piece will be ½ - 1 page long, single spaced, and should begin with a title and Three Key Points, bulleted, written in clear standard English in complete sentences that accurately describe the content of the rest of your writing. After the Three Key Points will be your paragraph text response to the assignment. Each assignment and its due date are provided in the Schedule below. A laptop computer and printer will be available during the trip.

River of Lakes

Our text for the trip is *River of Lakes* by Bill Belleville. Reading assignments are broken up as follows.

Assignment #1 – Chapters 8, 9, and 10 (pp. 141-192).

Assignment #2 – Chapter 4, 5, 6 and 7 (pp. 60-140).

You are encouraged to read Assignment #1 first, then #2. The first three chapters of the book are recommended reading but not assigned.

Disciplinary Question

You will also seek to answer a question related to your academic discipline during the trip. Please define an interesting problem related to your discipline that you will answer on your trip. It need not be a novel research question; just something you want to learn on the trip. Examples follow.

- "What are the critical considerations and challenges to making field measurements of nitrogen and phosphorus in natural waters?"
- "How does nitrogen concentration vary with proximity to shore?"
- "What historical and economic factors have shaped the culture of the people of the SJR?"

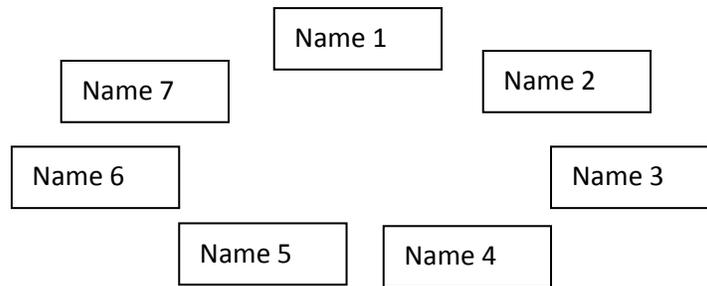
For the first disciplinary question assignment, write your original disciplinary question, describe why you're interested in that question, and list the kinds of observations you will make on the trip to develop an answer.

Peer Evaluation

Each assignment will be read aloud by another student member of the group during group discussion times and evaluated afterward. At the start of each discussion, you will hand your paper to its peer evaluator, who will read verbatim your Three Key Points. You will also read the Three Key Points of the paper handed to you. After each student reads, discussion of individual ideas and common themes will follow.

After the discussion, each peer evaluator will grade the response handed to them with a grade of either “check” or “check-plus” and share their evaluation with the trip leaders. Check-plus ratings are reserved for very high-quality work, in which individual thinking, research, experiment or synthesis of ideas rises above the rest of student contributions. You may check your peer-assigned grades with the trip leaders. Thus the grades you assign as a peer evaluator will be known to the student writer.

Peer evaluation of each student’s work will rotate around the circle below. Your first written assignment will be the person beside you in a clockwise (CW) direction, so they are CW1. The second assignment goes to the person two spots after you (CW2), and so on.



Schedule

Assignment	Due Date	Reader
Reaction/reflection (RR) to River of Lakes Assignment #1 (RoL1)	Last pre-trip meeting on campus	CW1
Disciplinary question (DQ)	Sat 3/12	CW2
Progress on answering DQ	Mon 3/14	CW3
RR to RoL2	Thurs 3/17	CW4
Final response to DQ	Sat 3/19	CW5

Thumbnail Images

Radha Pyati



April Moore



Image Representative of Article

