

Beyond Reflection Through an Academic Lens: Refraction and International Experiential Education

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Advocates of experiential education embrace an educational philosophy that focuses on learning from experience, or learning by doing (Walter and Marks, 1981), and reflection on that experience. The origins of experiential learning are varied. We can trace experiential learning through the social theories of John Dewey (1963) and Paulo Freire (1970) in which the experience was part of education but also part of the citizen's way to connect with the community. Business and industry advocates champion social theories that emphasize the benefit of experiential learning in providing the student with skills to be a better worker. According to experiential learning theoretical frameworks, learning is considered a process that involves the reconstruction of experience taking into consideration the "action" of participating and working in a different environment and the "thinking" or reflection about that experience and context. Educators seek to encourage critical thinking and problem solving skills through student reflection on the reconstruction of the experience and the discussion and framing of key issues.

The goal of experiential learning is to expose students to a practice that enhances the knowledge of a subject. When we integrate this practice in an international arena we embrace a third important component—another culture—and we incorporate resources from the host culture into the course.¹ Pagano (2007, p.61) explains the importance of incorporating international elements in a course in that they amplify the experiential learning experience "which challenges the participant's identity, understanding of their home culture, and their outlook on the global job market." Since learning does not occur in a vacuum, during an international internship (II) or an international

service learning program (ISL) the goal of the experience is to learn skills (or practices) and to understand the international context and/or work environment complimentary to course work. One of the highlights of this practice in international education settings is that students acquire knowledge not only about the subject matter and practice, but also about the culture of the country and ideally how to function in a particular foreign setting.

II and ISL programs, if planned carefully, can provide students with substantive knowledge, a deep understanding of the host culture, and skills important in collaborating and working with the host community because the experience is not isolated from the social and physical context. In a psychological study of the construction of shared knowledge, Jeong and Chi (1989) report the benefits of collaborative learning in improving social relations, motivation and learning. Collaboration in an international experience can be a social process that fosters knowledge development. Pagano (2003, 13) states: “Students learn as social participants in work or a project by associating with members of the community and reflecting upon those interactions. The social and physical context that surrounds the experience, relating to communal living, is a critical component in the examination of learning outcomes.” Boud and Miller (1996) state in this regard:

“Any examination of learning needs to take account of that context. Our world is defined by the people and objects that surround us, the meanings with which they are imbued and the language which is used to represent them. This world manifests the political, social, economic, and historical situation in which we exist...Learners create an internal representation and judge their actions accordingly. This internal world is a filter through which perceptions are modified” (p. 18).

The internal representation referred to by Boud and Miller (1996) is what cognitive psychologists refer to as mental models. The idea of mental models originated with Craik (1943) and is defined as shorthand schema or models for the world or some aspect of it (Oatley and Djikic, 2008). The international context of an international internship or service learning program is one of the main elements that allow students to develop a mental model of the world. The construction of knowledge is then based on a triad—subject matter, practice, and context. We need to design and assess experiential education with careful attention to these three elements.

Reflection and Experiential Education

There are several models in experiential learning theories, but Kolb's (1984) model is widely used because it states that students can learn from experience. Kolb agrees with Dewey's (1963) statement affirming that in order for learning to take place and be considered educational, the experience has to be transformed into knowledge by means of action or *reflection*. When applied to study abroad, Kolb's model can facilitate and guide some of the learning that takes place during the international experience because his model considers both experience and reflection.

In order to provide validation of experiential learning practices, such as international internships and international service learning, we face the challenge of documenting the effects these practices have upon students' learning, particularly in the area of the subject matter, if academic credit is to be assigned. The most popular tools used to assess students' learning during international internships and international service learning are reflection exercises. Reflection methodology in education, sometimes called reflective practice, became popular in the 1980s (Valli, 1992). Reflection as a process means helping students to take a step back to look at an experience, to frame it and to derive meaning from it. Ideally, the framing of the experience helps students sort out events from the practice and provides meaning and understanding for themselves about practical skills and course material.

Most students' reflection exercises are written, such as completing journals, guided questionnaires, diaries and papers, and have long been used as a way to promote reflective thinking and as a measure of academic validation of these learning experiences. The importance of written reflection, as Oatley and Djikic (2008, 2) note, is that it requires "externalization, which distributes some of the process from inside the head to the outside world."

While most recognize, as do we, the importance of written reflection, there are a number of critiques of reflection exercises as they are currently designed. First, there is less than optimal clarity of the purpose and systematization of reflection. In a critique of the different models of reflection in teacher education, Pedro (2005, 91) adds to Liston and Zeichner's (1990, 236) statement that few of these conceptual approaches "identify meaningful criteria for discerning what counts as good reasons for educational actions." Therefore it is challenging to guide students in the critical thinking process and/or to achieve specific learning goals when there is no clear consensus on reflection as a concept and its application in education.

Second, reflection exercises often rely heavily on students' own, uncontextualized accounts of events that do not directly discern the learning that takes place.

Knowles, Tyler, Gilbourne and Eubank (2006) articulate the limitations of reflective journals by stating: “Reflection ... is often limited by the practitioner’s own knowledge” (p. 165). In addition, in some exercises emphasis has been placed on practical knowledge, taking into consideration contact hours instead of contact with the relevant material at the work sites, for example.

The personal approach to thinking does not necessarily embrace the knowledge of the triad of practice, subject matter/curriculum, and context so that they develop and transform the previous knowledge base or mental model. This is because reflection does not imply learning, and the “act” of reflection is not in itself “an outcome... But reflection can lead to an [learning] outcome.” (Burton, 2006, 299) However, reflection can be useful in education when it is guided and well-facilitated as a method to lead to “a new way of doing something, the clarification of an issue, the development of a skill, or the resolution of a problem.” (Boud, p. 299)

If we wish to understand and to guide learning and the development of critical thinking and problem solving skills during experiential learning, we need to move beyond the general concept of reflection. We propose to move towards the concept of *refraction* through reflective practice. Refraction focuses on critical thinking skills and problem solving. The refraction process helps students understand and identify the intermediate processes of learning that aid the development of critical thinking skills. Refraction facilitates the synthesis of the curriculum and academic content of the course with the practice or related work and context. Thus refraction is designed to obtain meaningful and purposeful learning outcomes from reflection, such as developing substantive engagement and problem solving. Refraction highlights the importance of using guiding questions and faculty interaction to encourage students to use written reflection to go beyond current mental models—that is, to truly **think**.

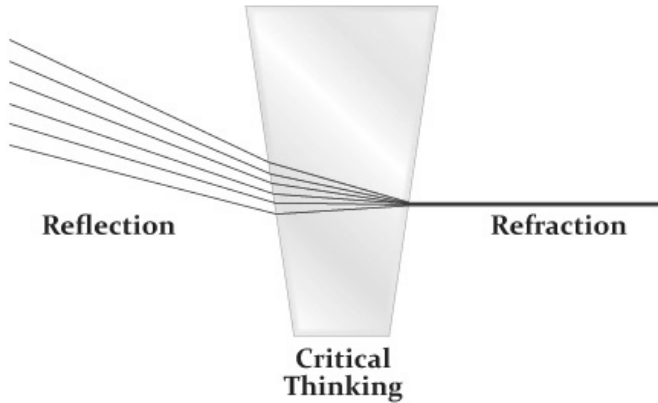
Refraction Knowledge Development Cycle

Reflection is one of the steps in the process that we consider crucial in building a knowledge base that goes beyond an individual’s own experience. However, we view reflection as only the first step in the process through which students take inventory of practical experiences, context, and academic subject matter.

We use a metaphor of light to describe the knowledge development process and to move from *reflection* to *critical thinking* to *refraction* (Figure 1). Greg Downey (2005) cleverly uses the light metaphor in re-entry orientations to describe the need to move beyond reflection. If we follow Downey’s metaphor, then reflection means to bend back the light. When we use reflection

as pedagogy we aim to obtain something more than a description of what is observed—of what is reflected back to us. Downey (2005) states, “A mirror does bend back the light, making visible what is apparent to others but it does not show how it affects the medium.”

Figure 1.



Reflection is the first step in the knowledge development cycle. Reflection is a process where we look at an experience, frame it and derive meaning from it.

Critical Thinking is the second step in the knowledge development cycle. Critical thinking demonstrates the ability to evaluate relevant information and opinions gathered in the reflection stage in a systematic, purposeful, efficient manner developing problem solving skills.

Refraction is the third step in the knowledge development cycle. ***Refraction is the transformative knowledge that occurs which validates the use of critical analysis and problem solving providing interpretation and conclusions of important issues and situations considering course content and the international context.***

For example, one can reflect on the logistics of a course without making connections, drawing any conclusions or taking action. Cognitive psychologists use the term “elaborative rehearsal” or “elaboration” to describe this (Craik, F and Lockheart, R 1972). Elaboration is important in memory improvement because it “involves relating new information to something you already know” (Tigner, R., 1999, p.2), but it does little to process information through analysis.

Our aim is to have students “affected” by the experience in a way that encourages critical questioning and making connections with course content and context. In reflection one carefully considers issues and topics, but reflection is not necessarily critical. Therefore reflection is a tool to help us take a

careful inventory of events or situations and, if done correctly, can help us move towards the next steps: critical thinking and refraction.

After reflection, we move into a more active mental process called critical thinking. If we refer back to the light metaphor, critical thinking is the stage where the light (experience) hits the medium affecting it in some way, causing a “reaction” to the medium which triggers critical thinking that analyzes and interpreting how the light/experience has affected us. In critical thinking one of the main goals is to recognize the relevance of different perspectives and for that we need to consider the materials gathered and inventory taken in the reflection stage. In critical thinking students actively try to develop skills by adequately conceptualizing, analyzing, synthesizing, evaluating, considering, and/or applying information to try to reach a conclusion or answer a question. During the critical thinking stage students attempt to learn how different dynamics of power permeate different systems and situations by making connections and seeing the linkages. In addition, in this stage students develop a degree of emotional distance to see more clearly possibilities about issues and people. This distance allows students to be open to new ideas that challenge their own beliefs and assumptions.

One specific strategy to guide students in this step is to have them develop guiding questions before they embark on their international experience. Guiding questions are most helpful when structured as follows:

What factors affect _____?

Under what conditions does _____ affect _____?²

Students can be encouraged to think about interesting questions associated with the general topic of the course or subject area for which they will receive academic credit. These need not be too specific, but should be based on some previous or newly acquired knowledge. Examples might include:

For a service learning course: What factors affect why water quality is so poor in a particular region?

For an internship: What factors affect how a public relations firm organizes its campaigns?

This is not to say that no other questions can be explored through reflection, but guiding questions serve as guides or beacons to which students can look to both ground their critical reflection and to illuminate a destination.

The third step in the knowledge development cycle is refraction. If we continue the light metaphor, refraction means: “The bending of a wave, such

as a light or sound wave, as it passes from one medium to another medium of different density.” (www.freedictionary.com). While reflection implies the movement of light directly from a medium (thus being able to reflect what we see), in refraction the light passes bent or obliquely so that the view is never exactly the same as in reflection. In refraction we look for how the experience has affected us and also how the “light,” the experience, has affected us in meaningful ways and how those reactions can contribute to our context and others. The experience is re-framed as in refraction. Refraction then is the transformative learning stage where we clarify issues by providing new facts and evidence. Central to refraction is the ability to see and to identify issues and experiences through different lenses. In refraction we aim to uncover situations and assumptions. In the refraction stage we (1) use the inventory taken in reflection, and (2) we single out issues from the same inventory—analyzing and making connections in critical thinking—that demonstrate learning skills and knowledge of the subject matter, practice, and context that provide interpretation of issues and situations from many different perspectives. The ultimate goal of refraction is to be able to offer alternative solutions, considerations and/or observations of issues at hand.

The construction of new perceptions and new knowledge about the host culture through international internships (II) and international service learning (ISL) may lead to what Mezirow calls “transformative learning” (1991). Transformative learning is a type of learning that relies on new experiences rather than old ones, and these experiences are reinterpreted. The new experiences in II and ISL programs in the context of the host culture allow students to re-frame those experiences through the reflection/refraction pedagogy. Refraction is the pedagogy that helps create new knowledge that provides a deeper understanding of the host culture and the academic course content.

In order to facilitate the design and assessment of experiential education courses, we created the Knowledge Development Refraction Table (Table 1). The first column contains characteristics associated with the Reflection stage, through which the experience is recollected and reviewed. The second column includes characteristics associated with the Critical Thinking stage, through which other viewpoints and materials are incorporated. Finally, the third column presents Refraction stage characteristics that provide evidence of integration, engagement with others, and new analytical perspectives. The experience, course content, and context should be part of each level to induce and develop further learning of subject matter and thinking abilities.

Table 1: Knowledge Development – Refraction: Assignments for each stage, to be applied in three area: a) practices/skills; b) academic content; c) context.

REFLECTION	CRITICAL THINKING	REFRACTION
Ask students to list, describe, track, or log	Ask students to answer a question, compare, contrast, or critique	Ask students to reflect critically and then actively offer solutions to problems, engage with others, and change mental models
Starts a dialogue	Weighs viewpoints	Offers alternative solutions
Recollects	Revises	Clarifies
Passive	Passive/Active	Active
Local view	Extends views	World view
Anecdotal	Critical narrative	Analytical
Conveys	Negotiates	Networks
Looks	Scrutinizes	Inspects
Accepts	Questions	Defines
Old materials	Past and present materials	New material
Content	Objectives	Schema
Individual perspective	Alternative perspectives	Integrates perspectives
Reviews	Scrutinizes	Selects
Personal	Detached	Intersubjective
Monocultural	Multicultural	Intercultural
Individual	Makes connections with others	Engages with others and scholarship
Sets boundaries	Amplifies	Boundless
Assumptions	Critiques of assumptions	Unmasks paradigms * Uncovers situations

Case Presentations: Moving from Reflection to Refraction in II and ISL

To illustrate how we assess refraction, we present examples of student work and our assessment in an international service learning course and in an international internship. It is important to note that faculty members facilitated student learning in both areas, encouraging students to go beyond reflection. Both authors structure their supervision of students along these lines. In addition, the international field experience must be relevant to course objectives. Otherwise we move away from the academic content of the course, creating a “potpourri” of knowledge that will not lend itself well to refraction.

Refraction: International Service Learning

The examples that follow are from a service learning program that took place in the Amazon region with a group of university students. The course consisted of class meetings before and during the service learning experience and after the service experience assignments. The experiential learning portion of the course took place during a short-term session in Brazil. The students had different types of assignments during the course. The example below is from an Arts Based Exercise where students literally had to draw critical issues they had observed during their service learning course experience and interpret the drawing. Student’s competencies should demonstrate academic content, experience, and intercultural development and proficiencies.

Example of Reflection

I drew the river with different colors. I drew the Tapajos River with brown to show its true color and then the Amazon in blue. The Tapajos River is a tributary of the Amazon. I mixed both colors where they get together. People here depend heavily on the river for anything they do. I never knew parts of the river are so polluted and it is creating so many problems for so many communities. We need to take this into consideration and start prosecuting the responsible for so much pollution. It does not seem that much is done about that...

This is a common example of descriptive reflective thinking that is characteristic of the first level in the Refraction Knowledge Development Cycle. As shown in the table, the statement starts a dialogue and recollects materials. The content carefully considers the academic knowledge of the subject matter, the Amazon River and its tributary, but also ends with a personal statement.

Example of Critical Thinking

The Tapajos river is an effluent of the Amazon river, the second largest river in the world. There is increasing concern about the potential neurotoxic effects of exposure to methylmercury for the 6 million people living in the Amazon, even in regions situated far away from the gold mines (garimpos), considered to be the major source of mercury pollution....

This description portrays the identification of a problem that is supported by specific academic subject matter, making connections with the effects of the pollution and considering consequences. It is less personal but extends views and considers old and present materials. The student is able to include the host culture concept and word “garimpos,” clearly portraying a multicultural perspective.

Example of Refraction

A list of actions we can take regarding pollution are hard to reach, considering the widespread corruption in the Amazon region. However, fish are contaminated with mercury in the area and kids we have seen so far in the fishing villages are truly sick and these people have not access, or money, for health care. The Rotary clubs are trying to help cure the sick but they are not able to fight the source of the problem. They bring physicians who volunteer to work with patients who have river illnesses...Monitoring of activities by the NGOs in the area is good but not enough. Involvement of the World Health Organization and the media is a necessity to make the issue public ...

This last example addresses environmental issues and the role of service organizations, thus engaging with the experience, context and scholarship. The student provides various sources of evidence of a problem, accepts challenges and provides a course of action. In addition, he demonstrates problem solving skills by providing alternative solutions and making some recommendations. This would have been even stronger if the student had incorporated relevant academic readings to engage with a community of interested researchers.

Refraction: International Internship

The second example presents the work of one student who completed an internship during a January term (4 weeks) with a public relations (PR) firm in Brussels. The student worked with a faculty mentor to establish readings to be completed before and during the internship. Communication was conducted

via email on a weekly basis. The professor also communicated with the student's supervisor in Brussels before the internship commenced, at week 2, and at the conclusion of the placement. The professor explained to the student that one of the challenges of the internship was to connect academic learning (specifically in his major, Communications) with the experience in Brussels. In particular, the student developed an initial question: What factors affect how PR firms are being used to promote European identity? The student was told that his weekly email journals should describe his experience and list his hours, and also show what progress had been made in answering his question, and include significant and thoughtful analysis incorporating the readings completed.

Example of Reflection

Pleon is the second largest public affairs/public relations agency in Europe, with offices in 23 cities. It is also the European sister-agency to Brodeur, their US counterpart. The Brussels office is the headquarters of Pleon Public Affairs, allowing them to work closely with the European Union institutions based in Brussels, as well as media, lobbyists, and NGOs. I believe that Pleon has provided me with an exceptional learning experience.

Here the student describes the placement and gives his personal opinion about his learning. His assessment of learning is not substantiated.

Example of Critical Thinking

One such organization that is struggling when it comes to communicating to over 450 million people is the European Union. After the negative votes in France and the Netherlands on the European Constitution, it became clearer to several people that the EU was not successfully communicating with Europeans, especially with regard to the benefits and basic operations of the European institutions. ... Speaking at a seminar last week, Margot Wallstrom, Vice President of the European Commission, said, "Communicating on Europe had been a largely 'Brussels' affair that had failed to properly involve national democratic institutions ... or to take account of the complexity and diversity of European public opinion.

Here the student identifies an important issue, the necessity of communicating a sense of 'Europeanness,' and makes specific reference to the statements made by Wallstrom as critical narrative. This represents the student's critical thinking on the topic.

Example of Refraction

The EU is beginning to realize that its most important stakeholders are the citizens of the member states. However, they have not effectively communicated with them. In an effort to mitigate what Indiana University professor Robert Rohrschneider describes as the “democracy deficit of the European Union,” Wallstrom has proposed “Plan D for Democracy, Dialogue, and Debate.” . . . At Pleon, we are interested in one particular aspect of the current representational performance—the media. This past week, I have been working on gathering information for our proposal to the European Commission.

Here the student has identified a pressing issue, the inclusion of citizens as stakeholders in the new Europe. He engages with the academic literature in this area by citing Professor Rohrschneider and connects his particular activity at the company—media representation—with the issue at hand.

Conclusion

Students today are becoming more interested in international opportunities for study, and are drawn to alternative programs such as international service learning and international internships. These programs, however, must be carefully designed. In this paper we have proposed using tools that go beyond our traditional understanding of reflection, in order to deepen the academic linkages to experience through reflection that leads to refraction. We introduce “refraction” as the transformative learning process that helps students understand and identify the intermediate processes of learning that aid the development of critical thinking skills. Refraction centers learning by integrating and elaborating the experience, the academic subject matter, and the context by examining assumptions and biases. Academic validation occurs only once we establish adequate tools to measure learning outcomes that are tied to the goals for a course. We believe that both purposeful design and the assessment of student work for reflection, critical thinking, and refraction moves us forward to the achievement of course objectives and learning goals within the international context.

Notes

¹We recognize the importance of organizational culture as contextual in nature, but here go beyond this to incorporate the international as contextual.

²See Roselle and Spray (2007) for an elaboration in the social sciences.

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