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EARTH UNIVERSITY

GCHERA GLOBAL CONFEDERATION OF HIGHER EDUCATION ASSOCIATIONS FOR AGRICULTURAL AND LIFE SCIENCES

TRANSFORMING HIGHER EDUCATION

Experiential learning

Foreword

The American University of Beirut (AUB), in partnership with the Global Confederation of Higher Education Associations for Agricultural and Life Sciences (GCHERA), EARTH University and the W.K. Kellogg Foundation has launched a project on "Transforming Higher Education". This project seeks to share five Key Elements of Success practiced by EARTH University and others with universities in Mexico and Haiti, and across GCHERA's global university network over a period of three years between July, 2018 and June, 2021.

The goal of the project is to advocate for the education of future leaders with the commitment to serve society–leaders capable of positively affecting changes in their environment, promoting peace and understanding, and respecting diversity while contributing solutions for the major challenges of the 21st Century. The project´s purpose is to encourage and facilitate change processes within the university as well as to promote greater university engagement with the larger community to achieve the twin goals of producing future leaders and change-agents, as well as fostering greater prosperity and equity in society.

This publication is one of a series of five papers that present Key Elements of Success the project seeks to share and which, taken together or individually, can contribute to facilitating university transformation processes. These five elements are considered fundamental in the successful education of leaders who will be prepared to offer solutions to the diverse and complex challenges of feeding an ever growing and more diverse population sustainably, mitigating and adapting to a changing climate while also contributing to the economic well-being of our communities. This requires leaders with strong ethics and values as well as solid grounding in theoretical knowledge and practical skills necessary to provide the technical, environmental and socially sensitive solutions required. The five Key Elements of Success presented in the series of papers are experiential/participatory education; community engagement; training in entrepreneurial education and business development; ethical and value based leadership; and decision-making and conflict resolution.

Three additional factors which enhance the impact of the five Elements of Success should be considered as well. The first is the role of the university professor as a facilitator of learning, the second is an explicit recognition that the five Elements of Success should permeate and be reinforced across the university educational system, including both curricular and co-curricular activities and programs and the third is the need for policy changes which are essential to their success.

The traditional role of the university professor as the repository of knowledge is increasingly being questioned. An educational system featuring the Key Elements of Success envisions a role for the professor as one who guides and facilitates student's learning through discovery, self-directed learning, analysis, reflection, group interaction, among others. The responsibility of the professor is to create a stimulating learning environment and provide students with real life opportunities to observe, develop ideas, apply theories, implement solutions and learn from the results. Rather than focusing on "covering the material", professors should be concerned with students learning on multiple levels, including problem solving and analytical skills, self-confidence, teamwork, personal relationship skills among many others. Professors should be recognized and stimulated for their innovations and contributions as "Facilitators of Learning". The professor's commitment to participatory education, to learning with and from the community, to providing continuous feedback and support requires time and commitment far beyond the delivery of lectures and supervision of laboratory sessions.

In addition to the changed role for the professor as the facilitator of learning, the entire university must be committed to the learning system oriented towards the five Elements of Success. As the five essays make clear, each element of success goes beyond the traditional classroom and involves everyone on campus and beyond, including community members. Participatory and experiential learning occur in the community, on farms, as part of research activities and as part of the university's commercial undertakings. Ethics and values are not just discussed and analyzed in the classroom but must be key features of the university environment, embodied in institutional policies and consistently demonstrated by university administrators, faculty, staff and students. The effective resolution of conflict is an acquired skill requiring systematic evaluation and analysis and should be actively practiced in relations between faculty, staff, administrators and students and well as between the university and the

larger community. Team projects in classes provide a fertile environment for fostering skills in resolving conflicts, as do co-curricular activities. The University engagement with the community involves administrators, faculty, students and staff as does the inclusion of entrepreneurship within the curriculum. Each of the five areas are complementary and reinforcing.

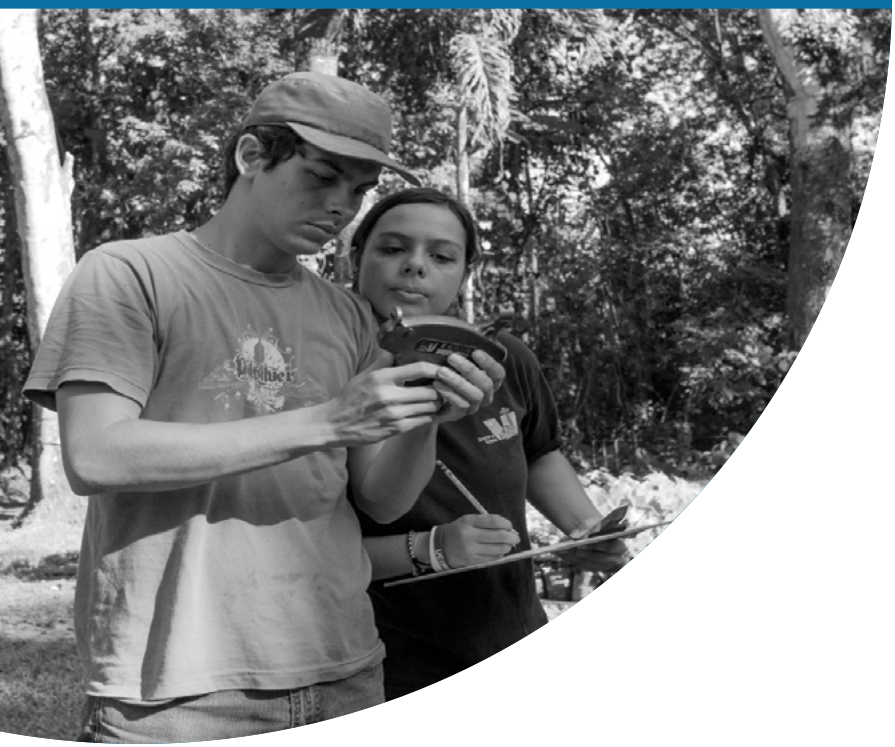
The successful integration of the elements of success will frequently require policy changes, and in many cases a rethinking of the university mission and vision. The education of leaders requires creating a student focused learning community and the university policies need to promote greater faculty, staff and student engagement with the community; student driven learning where students take on more responsibility for their own education; student led business ventures; student supervision of research, and other initiatives. Policy changes may involve changing study programs, institutional access by visitors from the community, student access to laboratories and fields, as well as the level of responsibilities given to students to reinforce their learning. University policies must recognize and reward the new role of the professor as the "Facilitator of Learning" as a valid and viable road to advancement within the University Community. Therefore, it is critical to consider policy changes to ensure any successful university transformation process.

We hope that this series of documents will be helpful to your university as you engage in a process of transformation. Please take them as an invitation to open a dialog and stimulate discussion to enhance the university transformation process[1].

James B. French | Project Director

1 What is written in this series of documents represent the views of the authors and does not necessarily represent the thinking or vision of American University of Beirut, GCHERA, EARTH University or the W.K. Kellogg Foundation.

Experiential Learning



Daniel Sherrard[1]

While recent decades have seen significant advances in food production, rapid technological development and economic growth, tremendous challenges confront our world, especially in developing regions. Widespread poverty, particularly in rural areas, climate change, environmental destruction and population growth are among the most daunting. In the view of many, the most important resource for confronting these challenges is the preparation of a cadre of change makers, ethical leaders with the knowledge, skills, experience and attitudes needed to devise and implement innovative solutions.

Agricultural change agents for the 21st century must be prepared to act ethically, to lead, to make decisions, must not be afraid of getting their hands dirty, be able to work effectively and harmoniously with others and be committed to building prosperous rural communities. Preparing young people for such a role requires a complex educational ecosystem, and one of the most essential elements making up that system is the approach to learning. Yet the conventional model of education, what Pablo Freire referred to as the "banking concept" of learning in which information is simply deposited in the learner, remains the predominant model and, in the opinion of many, is clearly not up to the task (Freire, 1968). Such a learning model is especially ill suited for preparing leaders capable of challenging the status quo, questioning the current state of the world and leading change processes.

The adoption of experiential learning methodologies holds tremendous promise in transitioning from an educational model and philosophy based largely on knowledge transfer to one that focuses on the active involvement of the learner in constructing knowledge. Experiential learning is particularly well suited to the complex and changing world of agriculture and rural development. In focusing on the subjective nature of learning, the learner is at the center of the educational process, rather than the teacher or the subject matter. Of particular importance is that experiential learning methodologies encourage the

1 Dr. Sherrard is ex-Provost of EARTH University

integration of propositional learning and the acquisition of practical skills and competencies in the context of "real-world" problems (Bawden, 1988). Experiential learning theory presents an alternative way to view the learning process and the perceived dichotomy between theory and practice, knowing and doing. Experiential learning theory seeks to integrate theory with practice.

Theoretical Background

In conventional programs in the agricultural sciences, students are presented with a multitude of propositions in the form of scientific facts, theories and principles and are expected to file them away ("bank them") until asked to draw on them when answering an examination. While they are also given opportunities to put some of these propositions into practice in the laboratory, opportunities to do so in the field are lamentably rare (and even rarer in "real world" situations). This approach to learning is based largely on abstractions and theories, is relatively standardized with the teacher in the role of the transmitter of knowledge and the students relegated to a more passive stance. Learning in this case is a four-step process beginning with the reception of information in which words are the symbolic medium, followed by the assimilation and organization of the symbols in order to understand a general principle. The next step requires making an inference from the general principle to a particular application and finally the learner moves from the cognitive and symbol processing phase to the realm of action.

In contrast to this model, experiential learning (sometimes referred to as "problem-based" or "problem solving" learning) is a four-stage cycle involving four distinct ways of learning: concrete experience, reflection, abstract conceptualization and active experimentation (Kolb 1984). Concrete experience and abstract conceptualization can be characterized as two opposing ways of grasping experience, what Kolb calls *prehension*, either through the interpretation of concepts *(comprehension)* or through tangible experience *(apprehension)*. Reflective observation and active experimentation, on the other hand, can be understood as two opposing ways of transforming experience, through either internal reflection or active external manipulation. Depending on an individual's preferred learning style, the learning process could begin with any of these steps. Take, for example, the way different people might approach

learning how to plow a field. Some might choose to observe how their neighbor plows, others might choose to engage more abstractly, by reading and analyzing a manual or text and others might just jump on the tractor and figure it out as they go along. This model can be represented as a continuous, iterative process rather than a linear one (Figure 1).

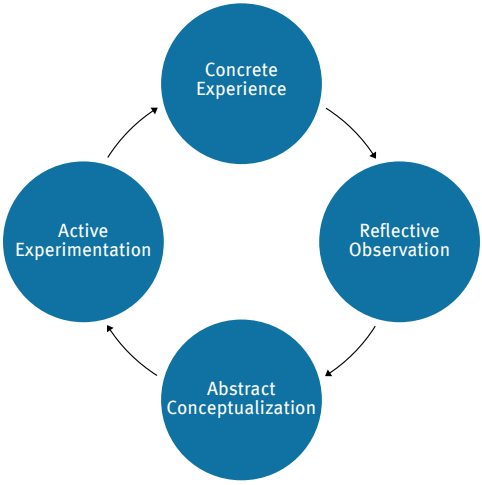


Figure 1.

Source: From Kolb, 1984

Experiential learning models have a long history in agricultural education. The land grant universities in the US utilized extensively "learning by doing" methodologies, particularly in their early years. Farm schools and institutes in many countries provided students opportunities to work and learn on institutional farms. Student placements with farmers and agricultural enterprises have long been common in Europe. However, as universities have become increasingly specialized and research oriented, opportunities for students to engage in activities up and down the food and fiber value chain have become scarcer.

As outlined earlier, for experiential learning to be meaningful and effective, it requires more than simply "doing" something. Obviously, the acquisition and application of theoretical knowledge plays a key role in this process as well. In each phase of the cycle, the learner must actively apply, analyze and make judgements about the knowledge she has previously acquired.

A process involving reflection, conceptualization and experimentation must accompany the "doing". In other words, the learning process must include the ability to act as well as understand, attribute meaning and the ability to apply the learning in different contexts. In the case of learning about agriculture, it is not sufficient for students to simply "do", for example driving a tractor. In addition to gaining an understanding of the mechanical aspects of driving the tractor, they should be encouraged to contextualize the experience and relate it to real world problems. This might include understanding the effects of the tractor on soil compaction and the implications for climate change of using fossil fuels. Too often, the learning process is truncated at the "doing" and there is little space provided for reflecting and applying lessons learned.

The past few decades have seen an increased interest on the part of universities, TVET (Technical and Vocational Education and Training) institutions and others in including more experiential learning opportunities in their programs. Student operated farms, many focused on organic farming, have sprung up on many campuses, and faculty members modifying their courses to offer more hands-on activities are among the innovations being implemented. Active student participation in the learning process is key to the success of experiential learning. Student participation in the design of programs, courses and activities, actively participating in decision-making and being held accountable for results, are important steps in developing opportunities for deep learning.

In many universities, there is a strong push to increase the level of community/university engagement and to provide students opportunities to actually practice agricultural production. At Egerton University in Nakuru Kenya, agricultural students are not only producing crops on University land, they are also undertaking internships in which they work directly with small farmers on their farms. Gulu University, in Gulu Uganda, does not have campus land for students to work on so they ride their bicycles out to surrounding farms to get experience. Zamorano University in Honduras has been a leader for over 75 years in the utilization of "learning by doing" methodology, and the success of their many graduates throughout Latin America is a testament to the power of experiential learning. Cal Poly State University in California is well known for its focus on experiential learning in many fields, including agriculture. The quality of their programs and the demand for their graduates is a reflection of the success of this approach. Interestingly, Cal Poly played a pivotal role in the development of EARTH University.

Experiential Learning at EARTH University

By the end of their fourth year at EARTH, students will have completed more than 3,000 hours of experienced based learning activities, applying theoretical concepts in multiple real-world settings, engaging in a professional internship and research projects, managed teams of people, led community development initiatives and run their own enterprise with a real loan.

Experiential learning forms the core of EARTH's academic model, and is the basis for the curricular structure, class syllabi and even the architectural design of the campus. At EARTH, professors deliberately design experiences to facilitate and give immediate significance and relevance to theory. Guided analysis and reflection of these experiences help students develop creative, critical thinking skills and a life-long passion for learning.

EARTH's two campuses, with a combined total of more than 12,000 acres, provide students with access to dry and humid tropical forests, wetlands, commercial and academic farms, food processing facilities, gardens, forestry systems, aquaculture pools, and waste management systems. These extraordinary resources make it possible for EARTH's professors to design a variety of experiences to facilitate the learning of theoretical concepts and for students to engage in processes of discovery on their own.

While experiential learning forms an integral part of all classes and teaching at EARTH, six keystone courses play a fundamental role in exposing and engaging students in real-world situations. These include:

Work Experience: In the first and second year, students spend half a day twice a week working in crop, livestock and forestry production "scenarios" on EARTH's academic farms. Under the supervision of fourth year students, and with faculty members playing an advisory role, students engage in routine production tasks and other activities required for the operation of the farms. These become more complex as students advance through their four years of studies and include opportunities for reflection and discussion.

Graduates often mention that the Work Experience sequence had a significant impact on their growth. They report that gaining mastery over even routine tasks, learning to ride a horse, manage cattle or harvesting crops for the cafeteria provided them a sense of accomplishment and increased self-confidence.

Entrepreneurial Program: All students develop and run their own agribusiness while at EARTH with a loan from the University. This is a multi-year course, beginning in the first year, in which students, self-organize into 5-6 person "companies", work together to decide on a business project, develop a business plan, defend their plan (and if approved) take out a loan and implement their project. Theoretical concepts in planning, accounting, finance, and marketing are introduced at critical points of the program. Depending on the business model, students may rent farmland on campus to grow crops, raise livestock, process food products in the processing plant or provide services.

The Entrepreneurial Project course is an ideal setting for student directed experiential learning. The different phases of the project provide multiple opportunities for students to apply their knowledge, reflect on and contextualize the experience, modify their practice, and live and feel the results of their actions.

Community Experience: From its founding, EARTH has been strongly committed to building strong, mutually beneficial relations with the rural communities and farmers surrounding the campus. Students play a crucial role in this dynamic, a process that begins with the non-Spanish speaking students who arrive in Costa Rica four months prior to beginning their first year and live with families in the communities as part of a Spanish immersion program. In their second and third year, students work with individual small farmers and organized groups on sustainable community development activities. For many students, this means spending one day a week over a fifteen-week period accompanying a small farmer and sharing whatever activity the farmer is doing on that particular day. Since the work of small farmers is highly varied and often includes social activities with other members of the farmer's family and community, through this interaction students gain a unique perspective that goes beyond technical aspects of agriculture. During this experience, students both access the knowledge resources on campus in order to propose solutions to key challenges facing rural communities and learn from the

life experience and wisdom of the farmers and community members.

Experience at EARTH-La Flor: In the third year of study, students spend seven weeks in Guanacaste in Costa Rica's dry tropics where EARTH's second campus is located, living with a host family. They conduct mini-internships with local agricultural businesses, develop a community project and meet weekly with classmates to reflect on experiences, conduct research on the La Flor campus and receive support from EARTH faculty.

Internships: During his or her third year, every student completes a 15-week internship. While the University's Internship Office provides assistance in the process, students are responsible for identifying potential internship hosts, establishing contacts and negotiating conditions for their internship. The selection of their internship reflects their individual interests. Internship hosts include companies, farms, NGO's, research centers and others. While students are encouraged to consider internship placements in their home country to ease their eventual return, many choose to undertake their internships in other countries and continents. As part of their internship, students are required to engage in a community development project, either of their own design or participating in an existing community initiative.

Graduation Projects: During their fourth and final year, students develop a yearlong graduation project that generally takes the form of a research project, and reflects the University's research priorities. The graduation project requires students to consider the challenges confronting society, particularly those effecting rural areas and the agricultural sector, and formulate a project that in some fashion addresses those challenges. Projects might focus on innovative ways to address the problems of agricultural waste management, evaluating the draught tolerance of different pasture species for arid regions of Africa, evaluating the feasibility of utilizing solar energy for desalinizing water or many other topics. Graduation projects are more than an exercise for students to demonstrate their ability to synthesize what they have learned and present the results in a coherent manner - they are envisioned as a crucial step in preparing the next generation of change agents.

Most people would agree that a tremendous amount of learning occurs in non-formal or extra-curricular activities during a student's years in the university, and this is certainly the case at EARTH as well. This learning typically conforms very closely to the experiential learning model. An excellent example of this is "EARTH Multicultural Fair" that fourth year students organize

each year to raise money to help finance the travel of their parents to the graduation ceremony. The Fair brings people from throughout Costa Rica to the Guácimo campus and features concerts, activities for children, campus tours and food stands representing the many countries present in the student body. While the University provides assistance, the Fair is organized and executed by students and is a rich opportunity to exercise leadership organizing and managing a complex event. It is also an occasion to learn how to resolve conflicts that inevitably arise (how to deal with fellow students who refuse to shoulder their share of the responsibility, how to distribute the funds generated to finance parent's travel, etc.).

Experiential Education in Agricultural Higher Education

Most people involved in teaching agriculture would agree that experiential learning methodologies are highly desirable. Yet many barriers seem to exist to adopting them on a larger scale. Some institutions do not have access to land on which students can practice, research and explore; some faculty complain of overly large classes and little time to do anything more than provide lectures; many, if not most, teaching faculty have little experience in using experiential learning methods and tend to teach in the same way they were taught as students.

Institutions like EARTH, Cal Poly and Zamorano are fortunate to have a tradition steeped in experiential learning philosophies and the resources (including land and committed faculty) that facilitate successful experiential learning. Nevertheless, there are abundant examples of teachers, faculties and institutions that have transitioned away from the "banking concept" of education and effectively adopted experiential methodologies. Encouraging, and in many cases requiring internships is a positive step in transforming students from passive to active learners. Creative out-of-class projects for individuals or groups of students is another. Simply forgoing certain lectures and asking students to work together in small groups to resolve complex and "sticky" problems using the theoretical knowledge provided in readings or recorded lectures is yet another way.

The key ingredient for creating change in higher education is people committed to change.

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