12-1-2007

Work in Progress - Designing for Economic Empowerment in Nicaragua

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Abstract – **Faculty and students in several disciplines at four institutions in the United States and Nicaragua are collaborating on technology entrepreneurship education for economic empowerment in Estelí, Nicaragua. The project aims to demonstrate a new paradigm for development that is rooted in education. The effort will focus on design and delivery of new curriculum for collaborative, interdisciplinary product development. To demonstrate the curriculum, the effort will launch cross-cultural student teams to identify and develop markets, partners, and technology for entrepreneurial ventures in Nicaragua, utilizing Nicaraguan materials and skills. The envisioned long term goal is local economic empowerment and a sound, collaborative process for technology innovation and product development that is both replicable and transferable. The proposed program includes six sequential phases; phase one is complete and phase two is in progress. This paper discusses the goals, results, and assessment of the first two phases in the context of the ongoing project.**

Index Terms – Cross-cultural collaboration, curriculum development, economic empowerment, entrepreneurship, innovation, product development.

INTRODUCTION AND MOTIVATION

In engineering there has been a proliferation of campus-based global development projects focused on addressing basic human needs or working to end poverty through technology. However, there is an apparent disconnect with the literature on economic development. Many of the current efforts in engineering education rely on a dependence/aid model in which engineers contribute/impose technological "expertise" on a community that is presumed to lack it. Engineers often miss the economic, social and political meanings of their work, and may overemphasize the importance of technology in their approach (especially when a primary motivation is the technical education of U.S. students). The literature reviews countless failed projects and critiques the aid model [1-3].

Our motivation is to explore a new paradigm for development rooted in multidisciplinary curricular design and delivery for entrepreneurial capacity building, avoiding past pitfalls identified in the literature [4]. Recognizing the limitations of each of our approaches, we hope to exchange expertise across disciplines, cultures, and nations. By focusing on education rather than on a particular technology or technology transfer, we can instill capacities to generate and assess multiple projects, increasing the chances of success and economic empowerment in the long run.

Our colleagues in Nicaragua represent a regional comprehensive university (FAREM) and a private technical university (UPONIC), both in Estelí. After war and natural disasters made Nicaragua the second poorest country in the Western Hemisphere and undermined the local capacity for economic regeneration and development, neoliberal trends in economic development have reduced government support for local industry while increasing the exposure of local business to international competition [5]. Today, small-scale entrepreneurial efforts can succeed only if they leverage community-specific competitive advantages, such as skills, resources, or partnerships.

Academics and business leaders in Estelí note that entrepreneurial students tend to replicate existing services and small businesses without utilizing the technological skills and resources available locally. Our Nicaraguan colleagues' motivation is to foster student innovation and creativity in order to facilitate the development of new technology microenterprises that will benefit Nicaragua.

Combining motivations, this project will develop an innovative inter-disciplinary and collaborative educational model designed to build entrepreneurial capacities that thrive in the new global context by drawing on existing local human and physical resources in Estelí. Such an educational program can ultimately result in a lasting advantage in ideation and innovation, creating successful new businesses that can provide employment and reduce poverty in the region.

PROJECT FRAMEWORK

The proposed project, supported to date by modest internal institutional funds, includes six primary phases, as listed in Table I below. The sequenced phases support each other and reflect the natural progression of ideation and innovation. Phases 1 and 2 involve faculty collaboration from the four institutions and are discussed in more detail below. Phase 3 is an intensive 2-week session in Estelí during which the faculty will deliver the curriculum on needs identification/ideation

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1-4244-1084-3/07/$25.00 ©2007 IEEE **October 10 – 13, 2007, Milwaukee, WI**
37th ASEE/IEEE Frontiers in Education Conference
T2E-22

and the students will work on cross-cultural teams to apply the lessons, focusing on possible technology ventures that meet local needs and resources. In Phases 4 and 5, student teams will collaborate remotely and at their home institutions as part of courses and independent work to continue idea refinement and selection, embodiment design, and testing. In Phase 6, the teams will realize their plans and launch their innovation/microenterprise. To close out this project, the faculty and students will also discuss together their continued plans and expected future directions.

TABLE I
PROJECT TIMELINE

Phase	Description	Dates
1	Initial Planning and Discussions	December 2006
2	Collaborative Curriculum Development	January-April 2007
3	Teambuilding, Needs Identification, Ideation	May 2007
4	Idea Refinement	June-December 2007
5	Embodiment Design and Testing	January-April 2008
6	Close-Out and Launch	May 2008

PHASE 1 - COMPLETE

In December 2006, 4 faculty collaborators from GVSU and Smith traveled to Estelí for one week to meet with our project partners from FAREM and UPONIC. Several previous trips were used to select Nicaraguan partners, develop contacts with community leaders and gain credibility. In the mornings, the U.S. participants attended Spanish language school, focusing on project-relevant vocabulary. In the afternoons, all faculty (4 U.S., 10-12 Nicaraguan) discussed curriculum development, collaboration processes, and logistics. In addition, we toured the Estelí region, visited partner campuses, and inventoried local technology resources.

Assessment for Phase 1 included gathering baseline data on collaboration experiences of participants and previous knowledge of entrepreneurship/innovation curricula among faculty and students. We are heartened that faculty from all four institutions are eager to participate and all have different innovation curriculum elements to contribute to the project. Our initial conversations were fruitful, forming the foundation for the rest of the collaboration, but we also encountered challenges in the areas of planning and communication.

Sending a tentative schedule in advance of our visit did not produce confirmation, leaving us unsure of our plans. However, once we arrived, our colleagues coordinated – seemingly overnight – a packed schedule of meetings, campus visits, and meals. Our interpreter suggested it is customary not to plan meetings far in advance, due to a sense that one cannot reliably predict future events.

The language barrier hindered both speed and clarity of discussion, necessitating several communication strategies beyond our elementary Spanish skills: pre-translation of our planned remarks during our language school sessions, use of a full-time interpreter, support from the few bilingual Nicaraguan faculty, translation of written materials, diagrams and other visuals, and nonverbal communication.

Although we hoped to engender collaborative discussions where each institution would learn from the others, this tactic was not successful initially in a large group. Through use of small group break-outs and active learning techniques, however, we successfully shared multiple strategies for teaching about entrepreneurship and product development.

The Nicaraguan faculty agreed that email and phone were the best way to communicate. However, email remains less reliable (for now) because computers are not readily available on campus, requiring use in one of Estelí's many Internet cafes (and not all faculty use email).

PHASE 2 – IN PROGRESS

The goal of Phase 2 is to collaboratively develop the initial innovation curriculum and student learning objectives. From our experiences in Phase 1 we have realized that a vibrant remote electronic collaboration is unlikely. Thus, our strategy for Phase 2 is three-fold: (1) develop (GVSU and Smith in concert) a partial template for the joint curriculum/objectives and solicit input and feedback from our Nicaraguan colleagues, (2) send two of the U.S. faculty in advance of the Phase 3 program to discuss the curriculum in person, and (3) review and refine the curriculum daily (with student feedback) *in situ* during Phase 3, tweaking as needed in future phases.

The curriculum development will draw on the faculty's own experiences, suggestions from their colleagues, best practices from the literature, and student input and will result in a template for delivering the innovation curriculum to a cross-cultural group of students.

The assessment of Phase 2 will address the resulting curriculum in terms of completeness, the extent to which best practices are included, and flexibility for future improvement, as well as the clarity, achievability, and measurability of learning objectives. We will assess the collaboration process by measuring quantity and clarity of communication.

CONCLUSION

We have proposed a new paradigm for development projects rooted in education. Partway through the implementation, we have learned that cross-cultural, bi-lingual collaborations require patience, time, and flexible tactics to develop – but are immensely rewarding.

ACKNOWLEDGMENT

We thank our many faculty colleagues and supporters in Estelí, without whom this collaboration would not be possible.

REFERENCES

[1] Rich, B. *Mortgaging the Earth,* Boston: Beacon Press, 1995.

[2] Agunga, R, "The Blame-Assignment Syndrome," *Developing the third World: a communication approach*, Commack, NY: Nova Science Publishers, 1999. 87-110.

[3] Easterly, W, *The White Man's Burden*, New York: Penguin, 2006.

[4] Hammer, M, "Why Projects Fail," *Ceres*, 26, 1, 1994, 32-35.

[5] Kendrick, F. "How the United States continues to manipulate Nicaragua's economic and political future," Council on Hemispheric Affairs, June 22, 2006. Avail: http://www.coha.org/2006/06/22/how-the-united-states-continues-to-manipulate-nicaraguas-economic-and-polical-future/, accessed October 2006.